OFDA Annual Report FY 1986

Office of US Foreign Disaster Assistance

Agency for International Development

Washington, DC 20523

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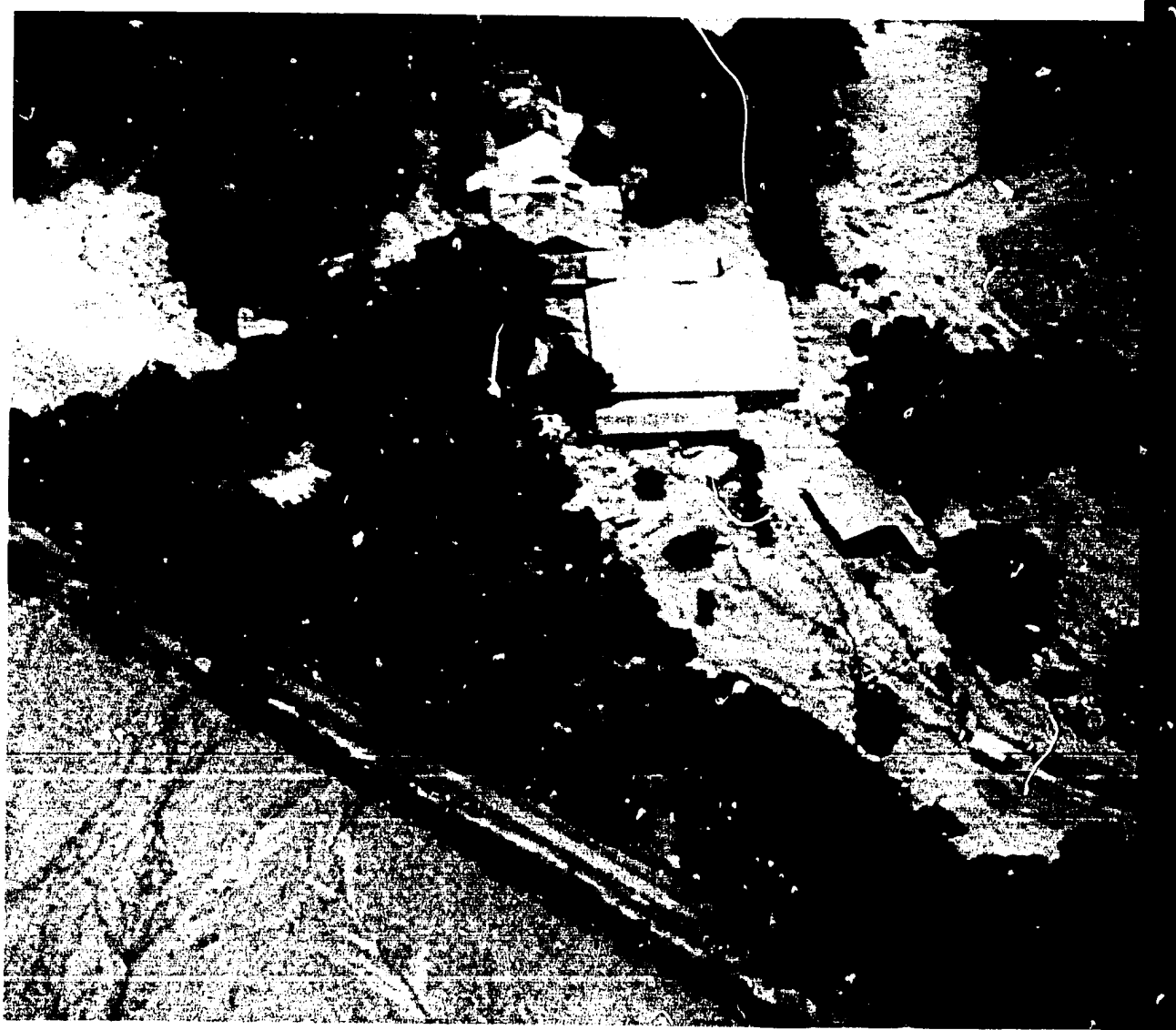
Aerial view of Armero, Colombia after volcanic mudflows swept through the town.



Message from the Director

When a disaster occurs, the news media focus on how many died, the damage, and the plight of survivors. Unreported is how the population copes after the disaster, how the government and voluntary organizations manage the emergency, and how the international community responds. The United States Government is one of the largest donors of international humanitarian assistance and the Office of U.S. Foreign Disaster Assistance (OFDA) within the Agency for International Development (A.I.D.) is responsible for providing and coordinating this assistance.

Providing emergency assistance requires not only sending supplies to a disaster-stricken country. We must identify what is needed, provide the most appropriate assistance, and support the existing response mechanisms.

On an annual basis OFDA responds to more than 40 major life-threatening natural and man-made disasters. This report summarizes our principal efforts throughout Fiscal Year 1986 which was marked by many tragic events. For instance, the eruption of Colombia's Nevado del Ruiz volcano killed nearly 22,000 people — the second-worst volcano disaster of this century. OFDA dispatched technical assistance personnel, blankets and tents, and U.S. Army helicopters to carry people and supplies to and from the affected and still threatened area. OFDA sent a team of scientists and pathologists to investigate the cause of an unusual toxic gas explosion at Lake Nyos in Cameroon that claimed more than 1,700 lives. The United States Government, through OFDA and the U.S. Missions overseas, spearheaded an internationally coordinated effort to combat the worst grasshopper and locust infestations throughout Africa in sixty years.

Investments in improving a country's disaster preparedness capabilities can help reduce damage and save lives. A significant portion of our effort is devoted to enhancing disaster preparedness in countries especially vulnerable. We fund the training of international participants who attend workshops, seminars, and conferences. We promote institution building by strengthening disaster preparedness programs. We support projects designed to provide advanced warning of an approaching tsunami, typhoon, or famine. Through our activities, we help countries better cope with disasters.

We are proud of our record of achievement and are pleased to share this annual report with you.

JULIA V TAFT
Director
Office of U.S. Foreign
Disaster Assistance

Preparedness, Early Warning, and Mitigation

Fiscal year 1986 was a year of accomplishment for OFDA. The office not only responded to calamities as they occurred but also acted to reduce the impact of future disasters. Working hand-in-hand with regional and national disaster management planners, OFDA implemented preparedness, mitigation, and early warning programs.

Developing nations initially may view the investment of scarce resources in preparedness and early warning projects to mitigate the effects of potential disasters as a relatively low priority. Experience has proven, however, that a disaster can offset the benefits of years of costly development work and cause problems that take years to overcome. The effects of disasters are often more serious and widespread than are evident in the initial aftermath of the events. The multiplier effect of a severe storm, for example, on many nations in the Caribbean, Central America, the Pacific, or South Asia touches every level of society. Businesses are destroyed, crops are washed away, infrastructure is eroded, and the gross national product declines. Survivors face not only the immediate challenge of day-to-day living but the longer-term battle to rebuild their homes, find employment, and rejoin productive society. Affected governments must confront these problems on a national scale at a time when the principal sources of revenue have been destroyed or severely impaired.

For these reasons, OFDA has encouraged the integration of preparedness, mitigation, and early warning with on-going development programs as well as with its own disaster relief programs. For a poor country which views the prospect of feeding its population as daunting even during normal times, the costs of adhering to building codes, conducting public information campaigns, and improving land use often seem prohibitive. A serious disaster that wipes out all livelihood in marginal zones, destroys low-quality construction, and claims the lives of a large segment of the population dramatically and tragically demonstrates the need for these measures. It often takes such an unfortunate catalyst to spur a nation into taking mitigating action. The short-term costs of preparedness, mitigation, and early warning can then be compared against a tangible and significant loss. A cost/benefit analysis at such a time strongly supports preparedness.

During FY 1986, OFDA expanded its preparedness efforts in several areas and countries. Equally important, a strong trend toward increased integration of disaster planning and development is emerging in several regions of the globe. A highly encouraging sign is the increased awareness of the importance of preparedness among both donor countries and developing nations. Throughout Asia, Africa, and Latin America, preparedness projects are demonstrating success.

Close to 60 percent of the world's major disasters occur in Asia, a region with an immense population. This is also a region which has experienced extremely rapid rates of development in the last several decades. The Asian Institute of Technology (AIT), an international, technological institute in Bangkok, identified the development of disaster management skills as an urgent requirement for the region. OFDA responded to the need by providing "seed" money for the establishment of an Asian Disaster Preparedness Center at AIT. The purpose of the Center is to train personnel in disaster management and to provide institution building, technology transfer, and information dissemination services for all of Asia. This project is also being supported by the U.N. Disaster Relief Office (UNDRO), which has contributed technical assistance, and the U.N. Development Program (UNDP), which facilitates participation by developing countries. Classes for disaster managers throughout Asia got underway in 1986 and initial feedback has been very encouraging. Another project is now being developed in Indonesia, jointly funded by OFDA and UNDP, to strengthen the disaster preparedness and disaster management capabilities of the Government of Indonesia.

In the South Pacific, seasonal cyclones annually cause extensive damage and loss of life. Disaster preparedness in this region has been greatly enhanced with the installation of the South Pacific Severe Storm Detection and Warning System (SPSSD/WS) in August 1986. This OFDA-funded system is able to track all tropical cyclones in the South Pacific by receiving high resolution images from both U.S. and Japanese satellites. Moreover, it can generate probable storm tracks based on an analysis of historical records of storm movements. The components of the system consist of a satellite ground station and computer and image processing facili-

ties. With this system in place, storm location and intensity are more accurately identified. The Fiji Meteorological Service, which serves as a regional warning center, issues advisories to other island countries in the region and also transmits valuable aviation information.

Non-emergency programs in Africa have focused on agricultural rehabilitation projects to help countries, particularly those in the Sahel and the Horn, to overcome the devastating effects of drought. To this end, OFDA provided funds from the African supplemental appropriation to support small water projects, food crop production programs, and seed procurement activities in several countries, as well as road and bridge repair in Sudan. While the latter was primarily to assure transport of relief supplies during the rainy season, the projects funded were expected to provide a development link by improving access to communities and stimulating agricultural recovery in western Sudan. (See Emergency Response, Prior-Year and Non-Declared Disasters.)

In the area of drought and famine surveillance, OFDA funded the establishment of a Famine Early Warning System (FEWS) as a regional monitoring program in Africa to identify potential nutritional emergencies before they become critical. Under the FEWS project, data on health, demographics, dimate, and crop forecasting are collected for analysis in Washington. OFDA will continue to serve in an advisory capacity to A.I.D.'s Africa Bureau and Office of Food for Peace in support of the design and implementation of early warning systems.

OFDA's Latin America and Caribbean Division, through a disaster preparedness strategy stressing regional endeavors, supports and promotes activities that strengthen national emergency organizations. The OFDA Regional Disaster Preparedness Office in San Jose, Costa Rica, provides valuable field support. On-site representatives provide rapid assessments and also serve an indispensable preparedness function by fostering organizational development initiatives.

In fiscal year 1986, OFDA significantly advanced regional cooperation and mutual assistance through preparedness training activities. The Latin American Workshop on Operational Management of Natural Disasters brought 40 participants from eight countries to Chile. The nine-day workshop provided emergency management training to professionals responsible for disaster response in their respective countries. OFDA co-sponsored this program with Chile's National Emergency Office (ONEMI) and the Pan American Health Organization (PAHO). Chile also hosted a Wildfire Suppression Course for 36 firefighters from 12 countries in the region. OFDA support of the First Latin American Symposium on Natural Disasters in Quito, Ecuador, and the International Colloquium on Disaster Assistance in Caracas, Venezuela, also fostered intra-regional collaboration.

Through an agreement with the Organization of American States (OAS), OFDA has supported the development of a training course for host country development officials to incorporate hazard risk analysis into the design of development projects. Two pilot sessions of the four-week course have been conducted at the Inter-American Center for the Integrated Development of Water and Land (CIDIAT) in Merida, Venezuela, where it is now fully incorporated into their curriculum.

OFDA's Tsunami Hazard Reduction Utilizing Systems Technology (THRUST) program, conducted by the Pacific Marine Environmental Laboratory of the National Oceanic and Atmospheric Administration (NOAA), is currently operational in Chile. THRUST is the first station that has the capability to monitor near-shore earthquake activity and to issue immediate tsunami warnings. The standard operations plan developed under this program, combined with the new technology using satellite telemetry for near-shore tsunami warning, constitutes a major technical and managerial innovation capable of saving thousands of lives.

Other preparedness activities also lend themselves to a worldwide approach. Pesticide han-

dling, storage, and disposal have become critical problems in many developing countries. OFDA has funded several projects to address this issue. In 1986, OFDA developed a slide course, suitable for presentation throughout the world, to teach farmers and villagers techniques for safe pesticide use. Additionally, the pesticide expert who designed this course also analyzed pesticide poisoning vulnerability by region, identified responsible organizations, and suggested ways to integrate chemical disaster response planning into U.S. and international disaster planning.

The grasshopper and locust infestations in Africa this past year focused attention on the immediacy of the pesticide handling problem. The United States took the lead in urging donors not to provide unsafe pesticides to African countries fighting the insects.

In another hazardous materials project, OFDA, in conjunction with A.I.D.'s Science and Technology Bureau, examined potential emergencies in two countries, Thailand and Western Samoa, and identified measures to handle an emergency should one occur. In the future, OFDA plans to expand this work to other countries.

Other types of preparedness and mitigation activities with worldwide application were highlighted in 1986. Fires in both urban and rural areas can prove devastating to developing nations. OFDA regularly works with the National Fire Protection Association (NFPA) and the U.S. Forest Service (USFS) to enhance other countries' firefighting capabilities. NFPA concentrates on urban fires and seeks to improve structural deficiences, building codes, and public awareness. Through its grant with OFDA, NFPA directs technical training programs and provides technical assistance and information. In 1986, NFPA conducted seminars for firefighting professionals and government administrators involved in disaster management in the Philippines, Indonesia, the eastern Caribbean, and Peru. NFPA also contributed to the strengthening of the Latin American regional fire protection agency.

OFDA's arrangement with USFS enables the provision of technical assistance for forest and grassland fires to developing countries. Under this arrangement, OFDA can quickly dispatch experts to the scene in the event of a disaster threat. USFS also provides training and technical assistance in firefighting techniques on-site in Arizona.

Death and human suffering resulting from a disastrous event presents the most compelling case for continued and augmented projects. But costs do not end with human lives. Property losses increase the misery of the affected population and extend the period of rehabilitation. On a larger scale, the slowdown of progress resulting from interrupted development programs frustrates government planning and places nations further in debt with little to show for their investments. The following disaster case reports demonstrate the magnitude of death, suffering, and damage faced by many nations in FY 1986 as well as OFDA's efforts to provide immediate relief and help nations restore basic necessities.

The data in the case reports include number of dead, injured, affected, and homeless. They are derived from official reports which sometimes understate the actual number of victims. For example, mortality statistics reported from long-term disasters — droughts and famines — usually do not accurately account for resultant secondary deaths, such as those occurring from starvation and disease. The case reports also include a record of the emergency assistance provided by the host country, international community, non-governmental organizations, and the U.S. Government during the relief phase of the disaster. The listing of assistance provided by U.S. voluntary agencies and the international community are compiled from reports submitted voluntarily to OFDA. Verification of accuracy of these reports and the dollar value of in-kind contributions is difficult. Therefore, dollar values indicated, with the exception of USG data, should be taken as representative figures.

Acronyms Used in This Report

U.S. Private Voluntary Organizations (PVOs) and Private Groups

ADRA	Adventist Development and Relief Agency
ANRC	American Red Cross
CARE	Cooperation for American Relief Everywhere
CRS	Catholic Relief Services
CWS	Church World Service
HKI	Helen Keller International
LWR	Lutheran World Relief (U.S.)
PVO	Private Voluntary Organization
SCF/US	Save the Children Federation/U.S.
SIM	Society of International Missionaries (formerly Sudan Interior Mission)
WVRO	World Vision Relief Organization
YMCA	Young Men's Christian Association

International PVOs and other Private Groups

CAFOD	Catholic Agencies for Overseas Development (U.K.)
SCF/UK	Save the Children Fund/U.K.
MSF	Medicins sans frontieres (Doctors Without Borders)
NGO	non-governmental organization

International Organizations

EC	European Community
ECLO	Emergency Center for Locust Operations (part of FAO)
FAO	U.N. Food and Agriculture Organization
ICRC	International Committee of the Red Cross
LRCS	League of Red Cross and Red Crescent Societies
LWF	Lutheran World Federation (international)
PAHO	Pan American Health Organization
UNDP	U.N. Development Program
UNDRO	U.N. Office of the Disaster Relief Coordinator
UNEOS	U.N. Emergency Operation in Sudan
UNHCR	U.N. High Commissioner for Refugees
UNICEF	U.N. Childrens Fund
UN/OEOA	United Nations Office of Emergency Operations in Africa
WCC	World Council of Churches
WFP	World Food Program
WHO	World Health Organization

U.S. Organizations

A.I.D.	Agency for International Development
CDC	Centers for Disease Control, Department of Health and Human Services
CINCPAC	Commander in Chief Pacific
DOD	Department of Defense
FFP	Food for Peace Office, A.I.D.
FFW	Food for Work, A.I.D. program
OFDA	Office of U.S. Foreign Disaster Assistance, A.I.D.
REDSO	Regional Economic Development and Services Office
RHUDO	Regional Housing and Urban Development Office
TFAF	Task Force for the African Famine
USG	United States Government
USGS	U.S. Geological Survey, Department of the Interior
WASH	Water and Sanitation for Health

Food Acronyms

CSM	corn-soya milk
DSM	dry skim milk
ICSM	instant corn-soya milk
NFDM	non-fat dry milk
SFCM	soy-fortified corn meal
SFRO	soy-fortified rolled oats
SFSG	soy-fortified sorghum grits
vegoil	vegetable oil
WSB	wheat-soya blend

Other

ORS	oral rehydration salts (a sugar-salt combination used to treat diarrheal diseases)
TDY	temporary duty (assignment)

U.S. Foreign Disaster Assistance FY 86

Country	Date	Disaster	Dead	Affected
Afghanistan[1]		Displaced Persons	—	—
Africa Regional*[1]		Drought	—	—
Africa Regional[1]		Insect Infestation	—	—
Argentina	11/19/85	Floods	12	150,000
Bolivia	02/28/86	Floods	29	260,000
Botswana	04/30/86	Drought	—	648,000
Botswana*	08/12/85	Drought	—	—
Botswana	08/15/86	Insect Infestation	—	—
Burkina Faso	06/26/86	Insect Infestation	—	—
Burkina Faso*	11/27/84	Drought	—	—
Burma	03/05/86	Fire	1	21,500
Cameroon	08/25/86	Lethal Gas Eruption	1,734	4,634
Cameroon[1]	—	Insect Infestation	—	—
Chad	07/25/86	Insect Infestation	—	—
Chad*	11/05/84	Drought	—	—
Chile	06/20/86	Floods	15	54,118
Colombia	11/14/85	Volcanic Eruption	21,800	7,700
Ethiopia	07/24/86	Insect Infestation	—	—
Ethiopia*	10/14/84	Drought	—	—
Fiji	04/21/86	Floods	19	215,000
Gambia[1]	—	Insect Infestation	—	—
Greece	09/16/86	Earthquake	20	45,000
Guatemala	10/15/85	Earthquake	0	12,000
Guinea-Bissau[1]	—	Insect Infestation	—	—
Haiti	05/29/86	Fire	1	3,300
Haiti	06/04/86	Floods	79	85,000

OFDA-Administered Funds

October 1, 1985 – September 30, 1986

Amount ($)†	Type of Assistance
631,224	Grant to IRC to provide additional funds for food purchase (Special Supplemental)
5,030,858	African Supplemental used for costs of FEWS System; ISTI purchase of trucks; grant to Helen Keller for Vitamin A program
168,851[2]	Grant to FAO for Sahel; personnel support
25,000	Ambassador's Authority contributed to local relief agencies
301,574	Ambassador's Authority used for local purchase of relief supplies; DOD airlift of plastic sheeting from stockpile and replacement; grant to Caritas
25,000	Ambassador's Authority given to GOB's drought relief program
1,000,000	African Supplemental used for GOB plowing-recovery program
1,183,587[2]	Grants to FAO and GOB; radios
227,498[2]	Ambassador's Authority donated to GOBF for grasshopper control program
3,138,976	African Supplemental used for well/dam construction & other water projects; emergency road repair
24,000	Ambassador's Authority given to Burma Red Cross
262,698	Scientists; physicians; tents; food; safety equipment
200,000	Grant to FAO for aircraft parts
940,841[2]	Grant to FAO for locust surveillance program; specialists
299,023	African Supplemental used for procurement & airlift of medical supplies
125,000	Ambassador's Authority given to Caritas for temporary housing project; additional grant to Caritas
2,744,301	DOD helicopters and crews; USGS technical assistance; DOD airlift of tents & blankets; radio equipment; local hire aircraft support
75,000	Grant to FAO for locust surveillance program
16,976,592	African Supplemental donated to CRS, LRCS, CARE, WVRO & other PVO's for agricultural recovery programs, transportation support, and emergency feeding
49,806	Ambassador's Authority used for local purchase of medical supplies & insecticides; rat poison, sprayers, & spare parts
25,453[2]	Part of FAO grant for Sahel
25,000	Ambassador's Authority donated to the GOG Disaster Relief Account
15,000	Ambassador's Authority used for support of local relief program and shelter
8,330[2]	Part of FAO grant for Sahel
5,000	Ambassador's Authority used for local purchase of relief supplies
210,783	Ambassador's Authority given to Haiti Red Cross for relief program; bridge parts; local purchase of hand tools

Continued

U.S. Foreign Disaster Assistance FY 86

Country	Date	Disaster	Dead	Affected
India	11/15/85	Floods	130	500,000
India	08/26/86	Floods	187	245,000
Jamaica	06/06/86	Floods	54	40,000
Kenya*[1]	—	Drought	—	—
Madagascar	03/18/86	Cyclone	99	83,885
Madagascar*	04/13/84	Cyclone	—	—
Mali	10/02/85	Insect Infestation	—	—
Mali	08/05/86	Insect Infestation	—	—
Mali*	11/03/84	Epidemic	—	—
Mali*	09/13/84	Drought	—	—
Mauritania	09/27/86	Insect Infestation	—	—
Mexico*	09/20/85	Earthquake	—	—
Mozambique*	01/08/85	Drought	—	—
Niger*	09/21/84	Drought	—	—
Niger[1]	—	Insect Infestation	—	—
Peru	03/04/86	Floods	12	150,000
Philippines	07/11/86	Typhoon	[illegible]6	730,357
Philippines	09/03/86	Typhoon	23	482,700
St. Vincent	09/26/86	Floods	0	142
Senegal	08/14/86	Insect Infestation	—	—
Sierra Leone	02/13/86	Epidemic	352	3,000
Solomon Islands	05/20/86	Cyclone	101	90,000
Somalia	04/17/86	Epidemic	1,307	7,093
Somalia*	09/26/85	Accident	—	—

OFDA-Administered Funds

October 1, 1985–
September 30, 1986

Amount ($)†	Type of Assistance
10,000	Ambassador's Authority donated to Prime Minister's National Relief Fund
25,000	Ambassador's Authority donated to Prime Minister's National Relief Fund
58,587	Ambassador's Authority used to support local relief program; DOD airlift of cots & plastic from Panama
171,960	Increase in grant to CARE for internal transport of food
21,772	Ambassador's Authority used for purchase of medicine
16,103	Increase in cost of INTERTECT contract
69,790	Ambassador's Authority; technical assistance
1,097,075[2]	Entomologist; flying time; pesticides; technical assistance; part of FAO grant for Sahel
872	African Supplemental used for increase in freight costs for cholera supplies
3,803,059	African Supplemental used for grants to Africare, UNICEF and CARE for feeding program, agricultural production program, and well construction
300,980[2]	Ambassador's Authority; part of FAO grant for Sahel used for equipment, sprayers, insecticides
1,362,291[2]	Local support costs; replace blankets, water containers, plastic to stockpiles; support for USFS, Bureau of Mines teams & other technical experts; construction equipment
5,412,071	African Supplemental used to purchase seeds, provide grants to WVRO & CARE, transport blankets
1,775,325	African Supplemental donated to LWR, CARE & Africare for relief programs and well rehabilitation
65,600[2]	Part of FAO grant for Sahel
293,249	DOD airlift of 340 rolls of plastic and replacement costs; local purchase rope; potato seed
355,500	Ambassador's Authority given to Philippines Red Cross; sardines & condensed milk; seeds; medicines
25,000	Ambassador's Authority donated to GOP relief fund
25,000	Ambassador's Authority used for local purchase of relief supplies
1,622,933[2]	Large plane operation; grant to FAO; malathion; technical assistance
22,800	Ambassador's Authority contributed to UNICEF/UNIPAC for medicines
563,988	Ambassador's Authority used for local relief effort; DOD airlift of plastic sheeting & water purification units; radio equipment; technical assistance; sprayers; housing rehabilitation assessment
25,000	Ambassador's Authority donated to UNICEF for transport of medical supplies
7,187	Protective clothing for chemical spill clean-up

Continued

U.S. Foreign Disaster Assistance FY 86

Country	Date	Disaster	Dead	Affected
South Africa	05/19/86	Civil Strife	62	70,000
South Africa	05/23/86	Food Shortage	—	850,000
Sri Lanka	01/16/86	Floods	168	554,000
Sudan	06/25/86	Insect Infestation	—	—
Sudan*	11/29/84	Drought	—	—
Sudan	08/26/86	Civil Strife	—	2,000,000
Tanzania	08/13/86	Insect Infestation	—	—
Uganda	03/28/86	Displaced Persons	—	1,000,000
Venezuela[1]	—	Pre-dis. Assessment	—	—
Yugoslavia	02/21/86	Floods	—	1,000
Zaire[1]	—	Insect Infestation	—	—
Z[illegible]	08/17/86	Insect Infestation	—	—
Total			**26,311**	**8,313,429**

OFDA-Administered Funds

October 1, 1985–
September 30, 1986

Amount ($)†	Type of Assistance
248,320	Ambassador's Authority and grants to local PVO's for purchase of tents, cots, blankets, and other relief supplies for Crossroads victims
125,000	Grant to Operation Hunger for feeding program in Homelands
25,000	Ambassador's Authority used for local relief program
1,024,948	Grant to Commission of European Community for procurement of chemicals, equipment, and personnel; entomologist
33,143,851	African Supplemental provided grants to CARE, UNICEF, & other PVO's for feeding, health, & water supply programs; Mission allotment for purchase and transport of sorghum
—	Grant to WVRO (January 1987)
50,000	Aircraft parts; helicopter survey
1,055,018	Purchase (part through LRCS) of 25,630 family kits for the displaced in the Luwero Triangle; grant to UNICEF for water project
2,000	Seismic evaluation
25,000	Ambassador's Authority donated to Yugoslavia Relief Authority
10,860	Technical assistance
100,000[2]	Grant to GRZ for helicopter flying time
$86,660,534	

62 Disasters
40 New Dedared Disasters
(33 Countries)
42 Countries and Africa Regional
15 Carried over from previous year(s)
10 Undedared (7 in FY 86)
14 Disaster types

†Preliminary figures subject to revision
*Carried over from previous year(s)
[1]Undedared
[2]Includes funds from an A.I.D. Development Assistance account administered by OFDA

Note:
The numbers of dead and affected for disasters carried over from previous year(s) have been previously counted and are not induded in this report; otherwise, a dash (–) indicates that information is currently unavailable.

U.S. and International Disaster Assistance FY 86

Dis. No.	Det DT	Country	Type	Str DT	No. Killed	No. Affected
8695		Africa Region◦*	IN	86/00/00	—	—
8605	85/11/19	Argentina	FL	85/10/00	12	150,000
8609	86/02/28	Bolivia	FL	86/01/00	29	260,000
8616	86/04/30	Botswana	DR	82/00/00	—	648,000
8622	86/08/15	Botswana	IN	86/00/00	—	—
8625	86/06/26	Burkina Faso*	IN	86/00/00	—	—
8611	86/03/05	Burma	FI	86/03/04	1	21,500
8634	86/08/25	Cameroon*	UP	86/08/21	1,734	4,634
8692		Cameroon◦	IN	86/00/00	—	—
8628	86/07/25	Chad*	IN	86/00/00	—	—
8623	86/06/20	Chile	FL	86/06/15	15	54,118
8603	85/11/14	Colombia	VO	85/11/13	21,800	7,700
8627	86/07/24	Ethiopia	IN	86/00/00	—	—
8615	86/04/21	Fiji	FL	86/04/12	19	215,000
8702	86/10/14	Gambia	IN	86/00/00	—	—
8638	86/09/16	Greece*	EQ	86/09/13	20	45,000
8602	85/10/15	Guatemala	EQ	85/10/10	—	12,000
8691		Guinea-Bissau◦	IN	86/00/00	—	—
8620	86/05/29	Haiti	FI	86/05/16	1	3,300
8621	86/06/04	Haiti	FL	86/06/01	79	85,000
8604	85/11/15	India	FL	85/11/12	130	500,000
8636	86/08/26	India	FL	86/08/00	187	245,000
8622	86/06/06	Jamaica	FL	86/05/15	54	40,000
8612	86/03/18	Madagascar	CY	86/03/14	99	83,885
8601	85/10/02	Mali	IN	85/00/00	—	—
8629	86/08/05	Mali*	IN	85/00/00	—	—
8640	86/09/27	Mauritania*	IN	85/00/00	—	—
8693		Niger◦	IN	86/00/00	—	—
8610	86/03/04	Peru	FL	86/02/00	12	150,000
8626	86/07/11	Philippines	TY	86/07/09	106	730,357
8637	86/09/03	Philippines	TY	86/08/27	23	482,700
8639	86/09/26	St. Vincent*	FL	86/09/08	—	142
8631	86/08/14	Senegal*	IN	86/00/00	—	—
8607	86/02/13	Sierra Leone	EP	85/12/00	352	3,000
8618	86/05/20	Solomon Is*	CY	86/05/19	101	90,000
8614	86/04/17	Somalia*	EP	86/00/00	1,307	7,093
8617	86/05/19	South Africa	CS	86/05/18	62	70,000
8619	86/05/23	South Africa	FS	86/00/00	—	850,000
8606	86/01/16	Sri Lanka	FL	86/01/00	168	554,000
8624	86/06/25	Sudan	IN	86/00/00	—	—
8635	86/08/26	Sudan*	CS	83/00/00	—	2,000,000
8630	86/08/13	Tanzania	IN	86/00/00	—	—
8613	86/03/28	Uganda	DP	86/00/00	—	1,000,000
8696		Venezuela◦	EQ	86/00/00	—	—
8608	86/02/21	Yugoslavia	FL	86/00/00	—	1,000
8694		Zaire◦	IN	86/00/00	—	—
8633	86/08/17	Zambia	IN	86/00/00	—	—

IDA Funds	Other USG Assistance[2]	PL 480	DOD	Total USG Assistance	US Volags	Intl Comm	Self Help
4,386	164,465	—	—	168,851	—	—	—
25,000	—	—	—	25,000	5,000	—	—
301,574	201,126	1,559,000	X	2,061,700	117,370	1,568,219	14,000
25,000	—	2,034,600	—	2,059,600	—	1,248,000	—
25,000	1,158,587	—	—	1,183,587	—	1,607,150	—
25,000	263,298	—	—	288,298	—	1,838,810	—
24,000	—	—	—	24,000	—	141,449	—
262,698	—	—	X	262,698	65,000	1,683,803	—
—	200,000	—	—	200,000	—	—	—
753,200	275,003	—	—	1,028,203	6,800	2,345,212	—
125,000	—	—	—	125,000	—	—	—
2,744,301	4,027	—	X	2,748,328	4,175,500	15,726,392	—
75,000	—	—	—	75,000	75,000	587,176	—
49,806	—	—	—	49,806	5,000	618,247	51,400
—	25,453	—	—	25,453	—	1,243,000	47,568
25,000	—	—	—	25,000	1,105,000	146,341	—
15,000	—	—	—	15,000	—	76,200	—
—	8,330	—	—	8,330	—	—	—
5,000	—	—	—	5,000	—	133,000	—
210,783	—	—	—	210,783	—	622,257	—
10,000	—	48,640	—	58,640	—	—	76,000,000
25,000	—	—	—	25,000	58,000	80,000	24,240,000
58,587	502,630	—	X	561,217	—	2,845,874	—
21,772	—	—	X	21,772	—	3,374,200	132,543
69,790	90,000	—	—	159,790	—	—	317,000
63,622	1,041,113	—	—	1,104,735	25,000	5,849,000	—
25,000	275,980	—	—	300,980	13,000	2,706,993	—
—	65,600	—	—	65,600	—	—	—
293,249	2,014	1,453,000	X	1,748,263	180,800	431,440	861,000
355,500	201,500	—	X	557,000	35,000	683,478	343,694
25,000	—	—	—	25,000	—	9,507	93,863
25,000	—	—	—	25,000	—	30,000	—
44,940	1,657,033	—	—	1,701,973	—	5,101,000	2,280,000
22,800	—	—	—	22,800	—	200,000	—
563,988	110,445	400,500	X	1,074,933	147,900	4,483,252	61,000
25,000	—	—	—	25,000	—	577,910	—
248,320	—	—	—	248,320	—	—	—
125,000	—	—	—	125,000	—	—	—
25,000	—	619,000	—	644,000	5,000	387,000	934,000
1,024,948	—	—	—	1,024,948	—	4,901,560	—
—	—	—	—	—	522,142	3,512,649	—
50,000	—	—	—	50,000	—	170,000	—
1,055,018	—	—	—	1,055,018	—	15,427,910	—
2,000	—	—	—	2,000	—	—	—
25,000	—	—	—	25,000	—	—	—
10,860	5,320	—	—	16,180	—	—	—
—	100,000	—	—	100,000	—	346,000	—

Continued

U.S. and International Disaster Assistance FY 86

Dis. No.	Det DT	Country	Type	Str DT	No. Killed	No. Affected
	Carried Over From FY 85					
8507		Afghanistan*◦	DP	84/00/00	—	—
8539		Africa Region◦	DR	85/00/00	—	—
8542	85/08/12	Botswana	DR	82/00/00	—	—
8511	84/11/27	Burkina Faso	DR	83/00/00	—	—
8506	84/11/05	Chad	DR	84/00/00	—	—
8525	85/03/05	Chile	EQ	85/03/03	—	—
8501	84/10/14	Ethiopia	DR	83/00/00	—	—
8546	85/09/20	Mexico	EQ	85/09/19	—	—
8516	85/01/08	Mozambique	DR	81/00/00	—	—
8547	85/09/26	Somalia	AC	85/08/24	—	—
8512	84/11/29	Sudan[1]	DR	83/00/00	—	—
	Carried Over from FY 84					
8492		Kenya◦	DR		—	—
8431	84/04/13	Madagascar	CY	84/04/09	—	—
8438	84/09/13	Mali	DR	82/00/00	—	—
8505	84/11/03	Mali	EP	84/06/00	—	—
8440	84/09/21	Niger	DR	83/11/00	—	—
Total					**26,311**	**8,313,429**

KEY

DIS NO	disaster number
DET DT	declaration date
STR DT	strike date
IDA FUNDS	international disaster assistance

Disaster Type

AC	accident
CS	civil strife
CY	cyclone
DP	displaced persons
DR	drought
EP	epidemic
EQ	earthquake
FI	fire
FL	flood
FS	food shortage
IN	insect infestation
TY	typhoon
UP	unusual phenomenon
VO	volcano

IDA Funds	Other USG Assistance[2]	PL 480	D O D	Total USG Assistance	US Volags	Intl Comm	Self Help
—	631,224	—	—	631,224	—	—	—
—	5,330,858	545,000	—	5,875,858	—	—	—
—	1,000,000	—	—	1,000,000	—	—	—
—	3,138,976	568,800	—	3,707,776	—	—	—
—	299,023	2,216,300	—	2,515,323	—	—	—
—	8,558	—	—	8,558	—	—	—
—	16,976,592	137,673,300	—	154,649,892	—	—	—
19,000	1,346,436	—	—	1,365,436	—	—	—
—	5,412,071	14,461,900	—	19,873,971	—	—	—
7,187	—	—	—	7,187	—	—	—
—	33,143,851	31,116,700	—	64,260,551	—	—	—
171,960	—	—	—	171,960	—	—	—
16,103	—	—	—	16,103	—	—	—
—	3,803,059	7,968,900	—	11,771,959	—	—	—
—	872	—	—	872	—	—	—
—	1,775,325	8,387,100	—	10,162,425	—	—	—
$9,105,392	**$79,218,769**	**$209,052,740**		**$297,376,901**	**$6,541,512**	**$80,703,029**	**$105,376,068**

No. of New Disasters: 47
No. of Declared Disasters: 40
No. of Countries: 38

*carried over to subsequent year(s)
°undeclared
[1]includes P.L. 480 shipments for Ethiopian refugees in Sudan
[2]includes funds from A.I.D. development assistance accounts and supplemental funds administered by OFDA, and other USG assistance

U.S. Foreign Disaster Assistance Summary by Fiscal Year

Fiscal Year	No. of New Disasters	No. of Countries	No. Killed	No. Affected	Contingency IDA Funds	Other USG Assistance
FY 64	29	23	3,112	3,992,241	$2,928,499	$3,305,661
FY 65	46	32	46,943	14,504,499	$2,438,872	$18,722,703
FY 66	46	35	7,044	4,672,245	$652,458	$1,038,740
FY 67	57	40	17,441	106,415,973	$3,743,051	$8,567,586
FY 68	48	36	3,844	5,521,382	$1,355,888	$9,509,891
FY 69	36	32	1,018,534	31,311,680	$4,446,757	$24,822,542
FY 70	50	36	72,915	8,518,309	$6,263,804	$11,859,373
FY 71	51	40	522,183	74,289,081	$15,822,511	$21,930,000
FY 72	29	27	115,381	13,435,589	$1,452,783	$210,289,507
FY 73	30	27	111,619	217,776,063	$14,062,254	$158,631,843**
FY 74	20	19	101,608	12,819,240	$2,542,979	$31,827,590**
FY 75	25	23	61,233	46,310,336	$7,006,385	$121,265,640**
FY 76	25	23	78,262	38,375,279	$12,056,098	$123,410,000**
TQ	6	5	6,589	708,700	$5,479,245	$277,108
FY 77	25	22	8,568	7,932,836	$21,445,529	$13,394,451
FY 78	33	27	28,269	52,134,391	$24,452,367	$1,720,101
FY 79	41	33	34,514	11,049,072	$24,548,448	$24,559,600
FY 80	32	27	1,635	7,760,985	$12,898,071	$68,312,206**
FY 81	22	19	11,527	4,607,227	$6,567,224	$51,798,500**
FY 82	35	29	43,352	40,463,621	$10,742,757	$51,040,086
FY 83	45	36	4,775	43,980,670	$7,858,390	$83,377,925**
FY 84	47	39	3,463	34,233,123	$15,097,749	$51,378,416**
FY 85	47	39	427,388	30,474,549	$19,863,848	$105,002,195**
FY 86*	47	38	26,311	8,313,429	$9,105,392	$79,218,769**
TOTAL	**872**		**2,756,510**	**819,600,520**	**$232,831,359**	**$1,275,260,433**

*Preliminary figures
**Includes funds from other A.I.D. accounts and/or supplemental appropriations administered by OFDA

PL 480	Total USG Assistance	US Volags	Intl. Comm.	Self Help
$5,410,940	$11,645,100	$805,317	$533,790	—
$25,213,459	$46,375,034	$3,627,301	$3,518,773	—
$23,729,904	$25,421,102	$1,567,990	$9,476,353	$16,157,100
$69,045,881	$81,356,518	$12,220,053	$172,860,511	$2,964,667,000
$21,634,945	$32,500,724	$7,719,299	$15,943,626	$606,865,000
$73,349,178	$102,618,477	$12,971,207	$95,496,828	$130,974,000
$30,608,673	$48,731,850	$12,191,711	$59,515,671	$96,595,000
$119,839,732	$157,592,243	$16,676,273	$266,635,252	$744,839,000
$147,802,110	$359,544,400	$13,178,379	$610,660,963	$107,320,000
$114,230,970	$286,925,067	$29,251,411	$200,892,728	$631,705,000
$134,477,940	$168,848,509	$3,216,263	$90,252,901	$36,173,000
$86,808,619	$215,080,644	$16,079,881	$263,430,083	$39,043,100
$39,215,454	$174,681,552	$49,093,875	$338,820,728	$970,510,327
$602,876	$6,359,229	$1,139,554	$1,689,431	$198,900,000
$11,909,226	$46,749,206	$14,390,669	$59,541,298	$6,040,094
$42,021,193	$68,193,661	$6,224,223	$186,136,632	$276,946,722
$15,318,512	$64,426,560	$39,420,510	$661,374,390	$477,844,108
$57,814,655	$139,024,932	$1,533,448	$35,810,102	$11,847,900
$12,100,000	$70,465,724	$23,890,844	$211,844,949	$6,022,007,896
$29,000,100	$90,782,943	$27,258,957	$237,092,847	$141,901,880
$87,333,943	$178,570,258	$2,452,734	$203,946,587	$119,800,332
$102,891,700	$169,367,865	$5,999,463	$238,707,189	$198,095,040
$678,622,015	$803,488,058	$80,634,275	$961,557,220	$87,906,439
$209,052,740	$297,376,901	$6,541,512	$80,703,029	$105,376,068
$2,138,034,765	**$3,646,126,557**	**$388,085,149**	**$5,006,441,881**	**$13,991,515,006**

EMERGENCY RESPONSE

Repairing a dike in food-for-work project in Timbuktu

Prior-Year (FY 1984 and 1985) and Non-Declared Disasters

While responding to new disasters declared in FY 1986, OFDA continued to provide relief and rehabilitation assistance to 12 countries in which disasters had been declared in previous years. In addition, OFDA funded relief activities or technical assistance in several countries or regions in which disasters were occurring or threatening but not officially declared. Locust and grasshopper infestations in such countries are discussed in "FY 1986 Disasters."

Afghanistan — Displaced Persons

(FY 1985 non-declared disaster)
OFDA provided a grant for $631,224 to the International Rescue Committee for the purchase of food for Afghans displaced by war within their own country. This was the remainder of a $4 million Congressionally mandated supplemental program administered by OFDA in FY 1985 to provide humanitarian assistance to displaced Afghans through grants to PVOs.

Total OFDA-administered Supplemental $631,224

Africa — Drought/Famine

By far the largest expenditure of funds in FY 1986 was from the special Congressional appropriation for the drought-affected countries of Africa. Although the famine conditions that shocked the world in 1984-85 had begun to ease by the end of the 1985 fiscal year, relief assistance in the form of food and logistical support was still urgently needed in the most seriously affected countries. The emphasis was changing, however, to recovery and rehabilitation.

The Task Force on the African Famine (TFAF) continued its coordinating function during the early months of FY 1986 to ensure that USG assistance was distributed effectively. Of the original $135 million in supplemental funding which OFDA was responsible for administering, $64,419,373 was obligated in FY 1985. (See *OFDA Annual Report FY 1985.)* The remaining $70,580,627 was obligated in FY 1986 for relief/rehabilitation projects in eight individual countries and for activities affecting several countries collectively (Africa Regional). The projects funded in FY 1986 are described below by country.

Food contributions administered by the Office of Food for Peace continued to be a major element in the USG response to African drought and famine in FY 1986. The value of food aid is also indicated below as are other USG contributions when that information was available.

African Regional

(Non-declared disaster)
OFDA funded several regional activities targeted to the drought-affected regions of Africa, in addition to country-specific activities. In FY 1985 a total of $9,288,460 (adjusted from $10,425,156 reported previously) from IDA, borrowed, and supplemental accounts, was expended to provide technical assistance for water projects, an agreement with NOAA for crop monitoring, reimbursement to PVOs for ocean freight expenses, and grants to the WFP and the OEOA for support of the Africa emergency program.

All FY 1986 obligations were from the African Supplemental. These were used mainly to establish a Famine Early Warning System (FEWS) to track conditions in areas with potential nutritional emergencies, using a biweekly reporting format. All information collected by USG and other agencies on health and demographics, general background, crop forecasts, and climatic and current weather conditions was to be integrated and analyzed in Washington to provide a continuous overview during the drought emergency. Whenever a critical situation was identified, a more focused and comprehensive information collection effort could be undertaken.

FY 1986 obligations for the Africa Region included the following:

Extension of contract with Tulane University for the collection of health and demographic information in seven countries (FEWS) $1,437,990

Contract with Greenhorne and O'Mara for a geographical data base management system for FEWS $49,737

Contract with the University of Pennsylvania for a regional transport network for FEWS $65,000

Contract with Price, Williams and Associates for analytical support for FEWS $783,499

Agreement with USDA for FEWS crop monitoring $593,000

Agreement with the Department of State for the services of a specialist (J. Olsson) for two years to assist in the development and management of FEWS $120,000

Grant to Helen Keller International for Vitamin A program for Niger, Mali, Chad, and Burkina Faso $71,980

Additional reimbursement to PVOs for ocean freight $1,681,696

Contract with the International Science and Technology Institute for the purchase and operating costs of 75 trucks $227,956

Total OFDA-administered Supplemental $5,030,858

Department of State's Bureau for Refugee Programs — supported OEOA's CY 1985 administrative expenses in coordinating the international response to the African emergency $300,000

Bureau of Food for Peace (Office of Ocean Freight Reimbursement) — provided grants to PVOs for relief shipments exclusive of P.L. 480 Title II food donations. A total of $4,455,000 was obligated from the FFP African Supplemental in FY 1985 and $545,000 in FY 1986 ..... $5,000,000

Total Other USG $5,300,000

TOTAL $19,619,318

Botswana

As drought conditions persisted nationwide for the fifth consecutive year, OFDA provided a grant to the GOB to support its agricultural recovery program $1,000,000

Total OFDA-administered Supplemental $1,000,000

TOTAL $1,000,000

(See also "Botswana — Drought," *Annual Report FY 1986)*

Burkina Faso

The 1985 agricultural year was generally good; however, in the northern areas of Yatenga and Soum the rains ended early with consequent poor crop production. An estimated 500,000 people were expected to be affected by food shortage.

An adjusted total of $363,210 in FY 1985 supplemental funding reflects an increase in the cost of medical supplies to combat cholera (from $69,325 to $70,430) and a decrease in staff and support costs of the Mission Emergency Relief Program (from $165,000 to $137,000), as well as the transfer of several projects to FY 1986 funding for which allocations were originally made in FY 1985.

FY 1986 obligations included the following:

Additional staff and support for the USAID Emergency Relief Program $10,976

Grant to GOBF for dam/spillway repairs (Ouagadougou Dam #2) $1,500,000

Grants to Africare for well-drilling/ rehabilitation (Yatenga Province) ... $350,000

Technical assistance for small water projects $200,000

Emergency road repairs (Kaya-Dori) . $400,000

Grant to GOBF for rural wells $520,000

Grant to SCF for a water project $60,000

Peace Corps wells rehabilitation (Nouna, Fada, and Tougan areas) $50,000

Increase in grant to Africare for food-for-work program (Yatenga) $20,000

Disaster Coordinator (USAID/Ouagadougou) $28,000

Total OFDA-administered Supplemental $3,138,976

Food for Peace — A total of 400 MT of emergency food, with a commodity value of $248,800, was provided through LRCS. Freight costs were estimated at $320,000.

Total FFP $568,800

TOTAL $3,707,776

Chad

An adjusted total of $3,690,896 in FY 1985 supplemental funding reflects a decrease in the IHAP grant (from $1,493,745 to $1,291,307).

FY 1986 obligations included the following:

Increase in the contract with Development Management for well rehabilitation . . $25,790

Travel costs of Dr. Graitcer for EPI program evaluation $4,663

Medical supplies procured through UNICEF $242,257

Airlift of medical supplies procured from DOD in Germany $26,313

Total OFDA-administered Supplemental $299,023

Food for Peace — A total of 2,500 MT of emergency food, with a commodity value of $222,000, was provided through CARE. Transport costs were valued at $1,994,300.

Total FFP $2,216,300

TOTAL $2,515,323

Ethiopia

Although a massive international relief program and the return of seasonal rains had combined to ease the tragic famine situation in Ethiopia, the crisis was far from over at the close of FY 1985. Insufficient rains in some areas, notably Eritrea, Tigray, central Wollo, and parts of Shoa and Harerge, and a shortage of seeds and agricultural inputs kept harvests well below normal. Reduced meat and milk production due to livestock losses contributed further to the food deficit. Thousands of drought victims remained in displaced persons camps unable to take advantage of the rains and resume food crop production. Despite a greatly improved food distribution system, inadequate transport infrastructure and continued security problems hampered food movement in some of the most seriously affected regions. The Government of Ethiopia estimated that more than six million people would be affected through 1986.

Taking carry-over stocks into account, the A.I.D. Mission calculated emergency food requirements would be in the range of 900,000 MT in FY 1986. The Mission's strategy was to address the relief needs related to the persisting famine, while also assisting short-term recovery to break the dependence on continued emergency feeding.

An adjusted total of $11,212,873 for FY 1985 expenditures from the African Supplemental reflects decreases in grants to AJJDC for relief supplies at Jinet (from $350,000 to $183,505) and to Africare for voluntary medical teams (from $300,000 to $109,302), as well as a reduction in the expenses of a Transamerica expert (from $18,319 to $16,872). The deobligation of a portion of the grant to UNICEF for well drilling (from $750,000 to $640,350) lowers the total for other OFDA-administered funds in FY 1985 to $27,615,644.

Obligations from the African Supplemental for Ethiopia in FY 1986 included the following:

Increase in grant to WVRO for operating costs of five nutritional/health centers . $2,800,000

Increase in grant to FHI for emergency feeding and health centers in southern Shoa and Gonder $120,560

Increase in grant to WVRO for operating costs for its food distribution program in Tigray $98,837

Grant to WVRO for truck lease in Tigray $600,000

Grant to CRS for transportation support for the Northern Initiative $1,687,355

Grant to UN/OEOA for operating costs of the consolidated truck fleet (of which 150 trucks and and 200 trailers were leased by USAID) $2,400,000

Purchase and ocean freight costs of 24,160 water jugs for the UNICEF program . . $28,952

Grant to CARE for emergency feeding program in Sidamo $64,900

Grant to CARE for emergency feeding program in Harerge $500,000

Grant to Partners for Productivity for seed program in Wollo and Tigray $250,218

Grant to LRCS for agricultural recovery program in Wollo $2,588,292

Grant to CARE for agricultural recovery program in Harerge $110,179

Grant to AJJDC for emergency feeding program in Gonder $350,000

Grant to WVRO for agricultural recovery program in several locations $3,000,000

Grant to SCF for agricultural recovery program in northern Shoa and southern Wollo $692,762

Grant to CARE for Agpak program in Wollo, Tigray, and Harerge $725,908

Grant to FHI for agricultural recovery program in Shoa and Gonder $468,273

Grant to LWR for Agpak program in several provinces $490,356

Total OFDA-administered Supplemental $16,976,592

Food for Peace — A total of 315,138 MT of emergency food was approved for Ethiopia in FY 1986, all distributed through PVOs. The food had a commodity value of $70,499,400; transport (ocean and internal) costs totaled $67,173,900.

Total FFP $137,673,300

TOTAL $154,649,892

Mali

Even with the onset of good rains in Mali, the food crisis and related problems continued through FY 1986. Three consecutive years of poor harvests preceding the rains had depleted food and seed stocks and reduced the size of animal herds.

The A.I.D. Mission planned to assist several needy groups: the herders and farmers of Gao and Timbuktu, regions of chronic food shortage; the farmers in marginal central zones, especially Mopti and Segou where rains were spotty; and the population of Kayes and Koulikoro regions, which suffered insect and bird infestations. The total cereal deficit was expected to be about 176,000 MT.

OFDA supported the Mission's objectives by obligating funds for the following projects and activities in 1986:

Additional funding for the DOD airlift and support of the Gao raft $259,653

Grant to Africare for a food-crop production program in the Dire region of Timbuktu, involving a small-scale pump irrigation scheme $1,723,000

Additional freight cost of cholera supplies (See "Mali — Cholera Epidemic," *OFDA Annual Report FY 1985*) $872

Grant to UNICEF for a remedial feeding program in northern Mali, providing supplementary meals for malnourished and drought-displaced persons $747,000

Amendment to CARE food-for-work grant for a program in Timbuktu $252,806

Sluice-gate construction in CARE food-for-work project

Grant to UNICEF for well construction (74 drilled wells) in Mancina, Tenenkou, Niono, and Youwarou $590,600

Grant to CARE for Mancina well project $150,000

Grant to WFP for repair of the Ferkessédougou Mali road $80,000

Total OFDA-administered Supplemental $3,803,931

Food for Peace — A total of 34,419 MT of emergency food, with a commodity value of $4,699,200, was approved for Mali (30,339 MT bilaterally and 4,080 MT through WVRO). Transport costs totaled $3,269,700.

Total FFP $7,968,900

TOTAL $11,772,831

Mozambique

Despite the return of rains to Mozambique in all but interior Inhambane and Gaza provinces, a substantial food shortfall was predicted for FY 1986. An estimated food deficit of 455,000 MT (UNDP) during the crop year would have to be filled by the international community. The causes of the critical food problem were complex and included rural insurgency, poor agricultural policies and inadequate infrastructure, as well as the residual impact of several years of drought. Some 5.1 million people were expected to be dependent on food assistance in FY 1986 (3.0 million in urban areas and 2.1 million in drought/insurgent-affected rural locations). Thousands of displaced persons required basic comfort items, such as clothing and blankets, in addition to food aid.

The A.I.D. Mission's strategy was to promote recovery by providing seeds, tools, and other essentials, while also maintaining the pipeline of emergency food. Therefore, the following projects received funding under the African Supplemental in FY 1986:

Increase in grant to CARE for Logistical Support Unit $600,000

Transportation of 11,700 blankets from Leghorn stockpile $97,610

Increase in expenses of CARE project evaluation team $630

Grant to Air Serve International for a monitoring program $76,000

Purchase of seeds as part of a larger, multidonor, seed-procurement activity $800,000

Grant to WVRO for an emergency feeding program in Tete, Manica, and Gaza provinces $236,000

Extension of grant to CARE for the Logistical Support Unit of the GPRM's Department for the Prevention and Control of National Calamaties (DPCCN) (included trucks, maintenance, personnel expenses, etc.) $3,601,831

Total OFDA-administered Supplemental $5,412,071

Food for Peace — A total of 66,421 MT of emergency food, with a commodity value of $9,631,000, was approved for Mozambique (40,000 MT bilaterally, 2,461 through CWS, AND 23,960 through WVRO). Transport costs totaled $4,830,900.

Total FFP $14,461,900

TOTAL $19,873,971

Niger

The effects of the long-standing drought in Niger were still widely felt in the fall of 1985. In areas still suffering from drought, such as Tchin-Tabaraden, a lack of local purchasing power was reflected in an increase in malnutrition. The A.I.D. Mission supported projects which provided food aid while promoting recovery to avoid continued dependency. The following projects received funding from the African Supplemental in FY 1986:

A grant to LWR for an emergency and rehabilitation project in Tchin-Tabaraden/Ingall to help the pastoralists of the region regain self-sufficiency $61,000

Extension of a grant to CARE for the MCH feeding program in Tanout $864,325

Amendment to Africare grant to provide continued support for a program of recovery and rehabilitation in the Damergou zone (a food-for-work project to support agricultural recovery and village restoration) ... $850,000

Total OFDA-administered Supplemental $1,775,325

Food for Peace — A total of 12,802 MT of emergency food, with a commodity value of $3,805,300, all distributed through CARE, was approved for Niger. Transport costs totaled $4,581,800.

Total FFP **$8,387,100**

TOTAL **$10,162,425**

Sudan

Thousands of people died and over one million left their homes and land to escape starvation as drought conditions worsened in Sudan in 1984-85. Despite an unprecedented international relief effort, the emergency was far from over at the dose of FY 1985. A daunting recovery effort was required to improve the health status of the people and restore the country's economic viability.

Generally good rains in the 1985 crop season produced a surplus of grain in the east; however, large segments of the population in the arid zones of Red Sea Hills, northern Darfur and Kordofan, and parts of Northern and Central regions still needed food aid in FY 1986. An estimated 400,000 MT of sorghum were required to feed about 3.6 million people who were displaced or without sufficient income to purchase grain.

Some 150,000 MT of grain were already in country (Port Sudan) from emergency shipments (including 100,000 MT of U.S. sorghum). The GOS required donor assistance to purchase the remaining 250,000 MT from the surplus areas. The goal was to store the grain at the village level before the next rainy season to avoid the enormous logistical problems encountered in FY 1985.

The A.I.D. Mission developed a strategy to address both the continuing emergency needs and the longer-term rehabilitation effort. The short-term phase focused on continuing the feeding and distribution program and establishing a capability to assess domestic grain production and the health situation. Satellite surveillance would be used to assist in identifying food deficit areas. Longer-term issues included support for the rehabilitation of the transport network, the renewal of water resources, the provision of seeds and critical agricultural inputs, and the stabilization of the soil to combat desertification and assure future food production.

The level of funding from the African Supplemental in FY 1986 for projects in Sudan reflected the urgency of response and the enormous effort still required to restore a measure of physical and economic health to that drought-ravaged country.

Amendment to a grant to the GOS for the purchase and operation of 10 General Electric locomotives and increase in the cost of shipping spare parts $134,055

Grant to Live Aid/Band Aid for distribution of relief supplies $1,000,000

Grant to CARE for a supplemental feeding program in Kordofan $573,698

Contract with the Environmental Research Institute of Michigan (ERIM) for a surveillance system [ERIM operated with Landsat TM (Thematic Mapper) imagery to analyze the cropped area west of the Nile. USDA covered the large-scale agricultural activity east of the Nile.] $435,081

Grants to PVOs for a supplemental feeding program (ADRA $515,000; SCF/US $390,000; SCF/UK $650,000; WVRO $195,000) (Mission executed) $1,750,000

Grant to UNICEF for a health and water supply program $2,000,000

Local costs in support of the Columbia Helicopter, Inc. airdrop feeding operation (funded by FFP) in remote western areas of Darfur $408,360

DOD return of 3 Columbia helicopters (from Khartoum to U.S.) $212,755

Sudan Emergency and Recovery Information and Surveillance System (SERISS) in USAID (a program to obtain nutritional, health, agricultural, and food availability data to target drought relief programs) $1,160,000

Contract with engineering firm (Parsons International) to assist Mission in the design of a wadi crossing on the proposed Zalingei-El Geneina road $12,229

Mission allotment to USAID/Khartoum for the local purchase and transport of sorghum $10,000,000

Water rehabilitation grants (CARE $750,000; SCF/US $432,507) (Mission executed) $1,182,507

Mission executed road and bridge repair/rehabilitation grants:

Bilaterally for emergency road and infrastructure repair	$11,500,000
Bilaterally for bridge and road rehabilitation	$500,000
Contract with Arkel Talab for rehabilitation of the Zelingei-El Geneina road	$360,320
Engineer for Zelingei road	$44,455
Contract with Arkel Talab for rehabilitation of the Kosti-Tendelti road	$1,477,804
Contract with Macafarri/Italy for road construction materials	$392,587

Total OFDA-administered Supplemental $33,143,851

Food for Peace — A total of 9,496 MT of emergency food, with a commodity value of $4,198,700, was approved for Sudan in FY 1986. Food transport costs totaled $14,464,000 ($1,297,000 for ocean freight and $13,167,000 for internal transport), and included funding for the western Darfur airdrop feeding carried out by Columbia Helicopter, Inc.

Total FFP $18,662,700

TOTAL $51,806,551

Sudan — Ethiopian Refugees

The adjusted total for FY 1985 obligations from the African Supplemental was $8,731,827, reflecting a decrease in the grant to LWR for the purchase of trucks (from $3,400,000 to $3,321,827).

Food for Peace — A total of 45,000 MT of emergency food, with a commodity value of $4,504,000, was approved for Ethiopian refugees in Sudan who were displaced by drought and civil strife. Food transport costs totaled $7,950,000.

Total FFP $12,454,000

TOTAL $12,454,000

Kenya — Drought

(FY 1984 non-declared disaster)
Increase in grant to CARE for internal transport

Total OFDA **$171,960**

Madagascar — Cyclone

(FY 1984 disaster)
Increase in cost of INTERTECT contract for housing rehabilitation

Total OFDA **$16,103**

Mexico — Earthquake

Although the earthquakes in Mexico on September 19 and 20, 1985, occurred in FY 1985, approximately one-fourth of OFDA's expenditures for this disaster derived from FY 1986 funds. The immediate USG response comprised large-scale search and rescue efforts as well as damage and needs assessments. The USG then focused on assisting the Government of Mexico (GOM) establish an emergency potable water supply system and repair Mexico City's water distribution system. Toward this end, OFDA dispatched water tanks and pumps, chemicals for water purification, leak detection equipment, and experts to provide technical assistance to GOM engineers.

(See *OFDA Annual Report FY 1985* for a detailed description of the disaster and the USG and other donor response.)

Return of DOD HF radio base-station, radios, and personnel $10,250

Local support costs for personnel and equipment $399,092

240 hand-held water purification units . $4,788

80 75-lb drums of HTH and local transport to Dover AFB $7,396

Two distilled-water stills (four liter/hour capacity) $4,112

Replacement cost and ocean freight for 5,000 wool blankets taken from Panama stockpile $24,000

A.I.D. handclasp labels for USG-donated equipment $1,268

Replacement cost for 91 3,000-gal. water tanks $188,825

Replacement cost for 20,000 2.5-gal. water containers $29,006

Water pumps, hose, clamps, and personnel $192,417

Rescue equipment (jackhammers, portable generators, bolt cutters) $100,898

Replacement cost for 120 rolls of plastic sheeting to New Windsor stockpile ... $33,240

On-site PVO coordinator $41,800

20 leak detectors with meter modules and rechargeable batteries $28,944

Temporary duty assignments of U.S. Bureau of Mines personnel and return of equipment $9,829

Additional support for USFS $200,000

DOD return airlift of water buffaloes and rehabilitation and return of light sets . $38,337

Rehabilitation and return of water purification units $19,959

Temporary duty assignments of search and rescue personnel $13,100

Logistics support (lease of warehouse in Mexico City) $11,840

Start-up costs of DOD heavy-equipment airlift (which was later cancelled) $3,190

Total OFDA (FY 1986) **$1,362,291**

Temporary duty assignments of OFDA and other A.I.D. personnel (travel account) . $3,145

TOTAL $1,365,436

Somalia — Accident

(FY 1985 disaster)
Purchase and airfreight of protective clothing for Somali recovery crews after the grounding and break-up of the Panamanian flag-ship, S.S. Ariadne, in Mogadishu harbor.

Total OFDA **$7,187**

Venezuela

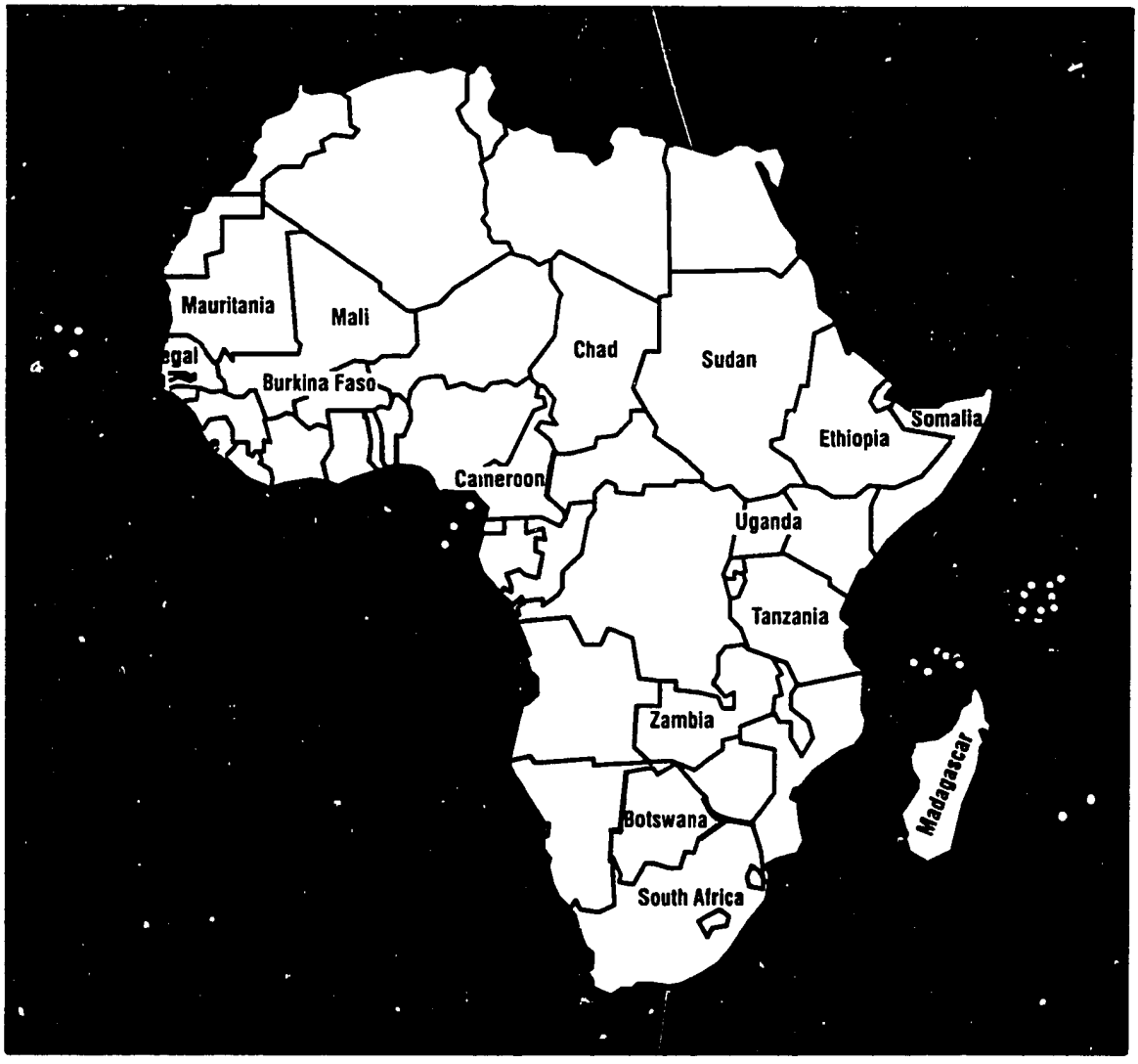
(FY 1986 non-declared disaster)
Seismic evaluation

Total OFDA **$2,000**

FY 1986 Disasters

Nymph stage of voracious Zonocerus variegatus *grasshopper*

AFRICA


Mauritania
Mali
Chad
Sudan
Burkina Faso
Somalia
Ethiopia
Cameroon
Uganda
Tanzania
Zambia
Madagascar
Botswana
South Africa

Grasshopper Infestation

After three years of drought and almost a decade of below average rainfall, the rains finally returned to the Sahel in 1986. But, with the welcome rains came the voracious Senegalese grasshopper, revived after lying dormant in the dusty, dry soil. This grasshopper, *Oedalus senegalensis*, is the major pest in West Africa. The grasshoppers' favorite food is grass but when that runs out, they will eat millet, sorghum, and other food crops. As early as October 1985, several Sahelian countries, particularly Mali, experienced a foretaste of the damage to harvests the grasshoppers would cause in the summer and fall of 1986.

The *Oedalus senegalensis* usually produces three successive generations of offspring in the course of one rainy season. Classified as a grasshopper, *Oedalus senegalensis* is usually a less dangerous beast than the locust, but it is nomadic and, under certain circumstances, shows a tendency to become gregarious. These grasshoppers move with the rains of the intertropical convergence zone. Although they tend not to swarm in the same frightening way as locusts, grasshoppers can systematically eat their way through large volumes of vegetation and can do tremendous damage to crops. The last significant grasshopper outbreak in the Sahel, in 1974-75, caused a loss of 400,000 MT of sorghum and millet. This latest infestation, coming on the heels of the drought, had the potential to cause the same damage and ruin drought rehabilitation efforts.

Although the potential consequences of grasshopper proliferation were clear, it was not easy to develop management strategies. Until the hoppers hatch, control options are limited. Once hatching occurs, one of the best control methods is to dust crops at ground level, using pesticides such as propoxur. If the infestation cannot be controlled by this method, then aerial spraying, using more powerful chemicals such as fenitrothion, carbaryl, or malathion, must be undertaken. At the beginning of the anti-grasshopper campaign, none of the Sahelian countries had adequate supplies of pesticides, sprayers, protective clothing, working aircraft, or trained personnel. In addition, two West African regional pest control organizations, OICMA and OCLALAV (the former with a mandate to control the African migratory locust and the latter to control the desert locust), were essentially defunct due to a lack of funds, and most of their equipment was no longer operable. This lack of preparedness meant that in many cases ground control programs were inadequate — too little, too late.

In order to prepare for a comprehensive control program, most West African countries convened emergency coordinating or steering committees, composed of responsible government officials and representatives from FAO and donor countries. With varying degrees of success, these committees developed action plans and lists of requirements.

The initiative did not always come from the host capitals, however. Sometimes a specific donor and often FAO would take the lead. In fact, as the situation in the Sahel worsened, the FAO Emergency Center for Locust Operations (ECLO) held a donors' meeting in Rome August 18-19, 1986, to devise a control program for West Africa. The meeting was chaired by Lukas Brader, Director of ECLO, and attended by representatives from Canada, France, the Netherlands, the United States, Japan, West Germany, the United Kingdom, the EC, Denmark, Italy, and other countries. The donors developed a control program and budget that totaled $3,290,000 for pesticides, equipment, ground support, and local operating costs. The USG contributed $1,217,338 toward this campaign, of which $770,000 was a grant to FAO. Total international assistance for grasshopper control in West Africa was approximately $34 million, of which the USG share was greater than $9.5 million.

After the 1986 program's completion, the international agencies and governments involved evaluated the insect control activities and identified tentative lessons learned and recommendations for future campaigns. Some of the most important recommendations include the need for:

a) training crop protection service personnel in standardized survey methods;
b) training farmers in the safe use of pesticides for ground control;
c) pre-positioning pesticides, sprayers, dusting bags, and vehicles;
d) testing the efficacy and appropriateness of EPA-approved pesticides; and
e) establishing intervention thresholds for grasshoppers and locusts.

The last point — the development of criteria for appropriate intervention — is of prime importance for planning. The lack of internationally agreed-upon threshold criteria in this campaign caused great uncertainty as to what constituted a "serious" infestation and what type of intervention was required. Intervention thresholds should be as simple as possible, but dynamic enough to allow for different periods of plant susceptibility.

Although donor coordination was anything but conflict-free, control efforts in West Africa were generally successful. All control activities had to be completed within a limited timeframe — certainly by late October 1986 — and the amount of pesticides, supplies, and personnel that had to be mobilized required prodigious efforts. The case reports in this section detail the experience in each of the most affected countries. The USG also contributed to control efforts in several other West African countries which experienced less serious infestations. These contributions were as follows:

Niger:
$65,600 through FAO for local costs ($35,000) and 4 sprayers ($30,600).

Guinea-Bissau:
$8,330 through FAO for one sprayer.

Cameroon:
$200,000 through FAO for spare plane parts. However, circumstances caused the cancellation of the contract with UTAVA, the GOC bird control agency (see section on Chad for more details). Instead, 5 radios were purchased for $7,488, and the remaining $192,512 was uncommitted as of February 1987.

Sahel:
$31,000 through FAO for overhead expenses of the $770,000 Sahel grant; $132,400 of this grant was unexpended as of February 1987.
$15,772 for experts to attend FAO/ECLO meeting in December 1986 on the 1986 campaign (FY 87).
$4,780 from OFDA's travel budget for 2 OFDA staff members to attend FAO/ECLO meeting on the 1986 campaign (FY 87).

Africa regional:
$1,325 for a procurement specialist at OFDA.
$4,386 for an entomologist to attend an FAO meeting in August 1986.
$10,825 for an entomologist (William Overholt) to participate on an FAO evaluation team to Senegal, Mauritania, and Gambia (FY 87).
$4,560 for an entomologist (Jack Drea) to participate on an FAO evaluation team to Chad and Niger (FY 87).
$4,605 for an entomologist (Carl Castleton) to participate on an FAO evaluation team to Burkina and Mali (FY 87).

TOTAL $483,583

Senegal

The situation in Senegal was one of the most serious in West Africa. A survey of egg pods undertaken at the start of the dry season (November-December 1985) identified a large number of egg reserves in Senegal between the latitudes of 14° and 16° N. In mid-May, a joint Senegal Crop Protection Service/USAID ground survey team counted a potentially alarming number of eggs in the Fatik-Kaolack-Kafrine and Casamance (southern Senegal) regions. The next month FAO began to repair Crop Protection Service (CPS) vehicles and prepare CPS staff for ground treatment operations. Major ground treatment got underway in Casamance after the Government of Senegal (GOS) allocated $1.0 million for the campaign.

As the summer progressed, the grasshopper infestation worsened and it was clear that ground treatment alone would not be adequate to save significant amounts of cropland. However, conflicting reports of the seriousness of the problem made it difficult to plan an intervention strategy. In addition, the two OCLALAV planes in Senegal were both in need of repair and other critical materials were in short supply. For the first step of a potentially large operation, the USAID Mission in Dakar requested an entomologist, a pilot/instructor, and spare parts for the OCLALAV aircraft from A.I.D./Washington. A.I.D.'s Africa Bureau provided the requisite funds (for a breakdown of USG assistance, see the following section), and an entomologist formerly with USDA's APHIS (the USG domestic pest control service) arrived in Senegal on August 14. His first field assessment that week found upwards of 200,000 ha of heavy infestation from Matam to Bakel and in pockets of Louga region. A total of approximately 1,000,000 ha, or 42 percent of Senegal's arable land, were at risk.

Based on this indication of heavy infestation, U.S. Ambassador Lannon Walker declared a disaster on August 15. Because much of the Sahel region began to show potentially large areas of infestation, OFDA put together multi-disciplinary teams to help the U.S. Missions in the area assess the situation and devise action plans. OFDA sent a six-member team consisting of a team leader, an OFDA staff member, an entomologist, a logistician, an operations specialist, and an aviation specialist to Senegal. The team's mission was to work with the GOS and donors to develop a plan for strategic intervention and grasshopper control.

By this time, President Abdou Diouf had established an ad hoc Cricket Crisis Committee under the auspices of the Ministry of Rural Development to facilitate donor contributions and coordination. The U.S. Mission and OFDA team proposed an action plan to the Committee to attack the most critical contiguous areas (200,000 ha in Matam-Bakel and 160,000 ha in Louga-Linguere) using four four-engine prop planes (DC-7s) with 3,000-gallon tank pesticide capacity. This "big-plane option" was startling to some of the European donors, particularly the French, because it differed radically from their traditional approach. Americans and Canadians, with their wide open spaces, tend to view a large-plane spraying operation as the most efficient method of protecting cropland and the surrounding rangeland. Many Europeans, on the other hand, find small spray planes, which can target specific areas, more efficacious for their pockets of agricultural land. This created a basic philosophical difference between the American and European approaches to pest infestation and control. The U.S. believes that the African situation, with large, contiguous infested areas, is suited to the large-plane approach and that it is imperative to spray infested grasslands before the voracious insects move to crops — another point of contention. Another argument advanced by the U.S. was that spraying was possible only for another several weeks, until mid-September at the latest, and that a successful small-plane operation could not be mounted in time.

Finally, at a meeting on August 25, the GOS, FAO, and all donors agreed to a three-pronged strategy. This consisted of: 1) big-plane spraying of 360,000 infested ha in northern Senegal using malathion, from September 1-15; 2) small-plane spraying of pocket areas of infestation using fenitrothion, from mid-September to mid-October; and 3) ground spraying around villages, where needed, during the same period. Donor representatives in Dakar agreed that this was a comprehensive plan with a high chance of success if the various inputs — planes, pesticides, etc. — arrived on time.

On August 27, word was received from donor capitals of U.S., Canadian, and British acceptance of the Senegal plan, but of French and EC opposition; FAO then withdrew its support. The situation remained at an impasse for several days until President Diouf personally appealed to the U.S. to proceed with Phase I (the large-plane operation) of the three-pronged strategy as planned. To ensure the success of the operation and to demonstrate its commitment, the GOS provided the funds ($1,280,000) for the 212,500 liters of malathion necessary. Although this arrangement caused friction among the donors, the USG believed that the seriousness of the situation warranted U.S. unilateral action.

OFDA therefore contracted T and G Aviation to provide four DC-7s with crews and arranged the purchase of the requisite malathion for the Senegalese government. On September 6, all inputs for the operation were in place and the large planes began spraying in Louga-Linguere region. The planes sprayed 233,000 ha in this area in four days and then moved on to Bakel. In two days, 145,000 ha were sprayed. A total of 378,000 ha (929,362 acres) were sprayed in Phase I using large planes. Grasshopper kill rates averaged 90 percent.

Phase II, spraying with small planes, got underway on September 20 with one OCLALAV plane spraying around Dahra. This plane averaged two sorties per day, spraying about 1,500 ha daily. Initial spraying results (using fenitrothion) indicated an effectiveness rate of only 30-40 percent. Four Canadian small planes arrived on September 23 and treated approximately 146,000 ha in Linguere (north-central Senegal).

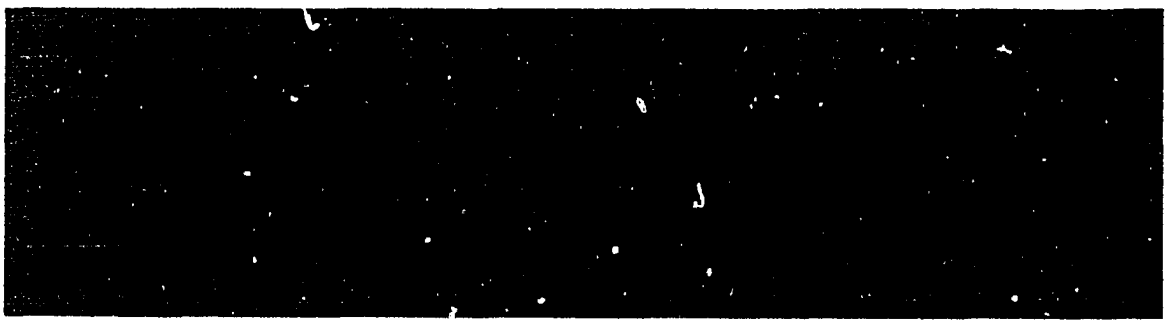
Meanwhile, OFDA agreed to leave the DC-7s in Dakar for several weeks in case their use was requested by other countries in West Africa before the close of the "spraying window." Survey teams were dispatched to assess the extent of infestation and the appropriateness of big-plane intervention. Mali, Mauritania, and Gambia each requested the DC-7s to spray in-

fested swaths in their countries. In Senegal, USAID/CPS survey teams found an upsurge of grasshopper infestation in late September: abundant rains in Louga-Linguere spawned a second generation of nymphs in densities of over 200 per sq. m in blocs already treated in Phase I, and up to 1,000 per sq. m in untreated blocs. The estimated area infested (more than 20 grasshoppers per square m) in Louga-Linguere was 650,000 ha. Casamance (southern Senegal) had an estimated 350,000 infested ha with grasshopper densities exceeding 50 per sq. m. The millet crop in Louga-Linguere and rice crop in Casamance were threatened.

At its September 30 meeting, the Cricket Crisis Committee decided on a plan of action consisting of the U.S. DC-7s spraying an additional 300,000 ha in Louga-Linguere and the Canadian small planes spraying in Casamance. During the next week, work proceeded feverishly to get the malathion and other supplies in place to launch the final grasshopper offensive of the 1986 season in West Africa.

On October 9, tragedy struck. Early in the morning, the four DC-7s took off from Dakar airport to begin spraying in Louga-Linguere. An engine on one of the planes caught fire and the pilot swung out over the harbor to drop the malathion into the sea. The pilot was unable to make a safe landing and the plane crashed into the ocean, killing three crew members. The fourth crew member was pulled from the wreckage by two fishermen and miraculously survived with only minor injuries.

The spraying operation was put on hold. Outpourings of sympathy came from President Diouf, other Senegalese officials, and representatives from West African and donor countries. After reviewing the situation, the president of T and G Aviation decided that the remaining three DC-7s should resume operations. In six final days of spraying in Senegal, 314,323 ha (776,378 acres) were treated in Louga-Linguere. On October 20, the four Canadian planes finished spraying 304,700 ha (754,000 acres). Below is a chart of aerial treatments in Senegal.



OCLALAV Cessna 185 with belly spray tank

Despite grave problems with donor coordination and logistical arrangements, and the tragic airplane crash, overall, the grasshopper control campaign in Senegal was a success. The infestation was eradicated before significant crops could be damaged, thus averting a potential major food shortage. Although another campaign is anticipated for 1987 because the grasshoppers were able to lay eggs before spraying took place, it is expected to go much more smoothly.

Summary of USG Assistance

(Please note: assistance was provided through OFDA unless otherwise indicated.)

FY 86

Aircraft parts for OCLALAV plane and a USDA pilot (A.I.D./Africa Bureau funds) . . . $50,000

Entomologist for 60 days (A.I.D./Africa Bureau funds) $25,000

5-member multi-disciplinary team . . . $21,176

OFDA team leader (from OFDA's travel budget) $4,040

Gloves, flight suits, eyewash kits, signal mirrors, gauges, pocket thermometers, cord, goggles, first aid kits, tape, head lamps for hard hats, and batteries, all from the U.S. Forest Service, and air freight $4,767

3 radios and 8 batteries from the U.S. Forest Service, and air freight $1,099

Ambassador's Authority used for local procurement of pesticides $25,000

Grant to FAO for equipment ($13,620), 4 sprayers ($29,095), and 14 radios ($18,933) $61,648

6 radios $16,150

Contract with T and G Aviation for large-plane operation $1,200,000

Support of large-plane operation (fuel, crew, supplies, etc.) $231,338

5 generators from the U.S. Forest Service and air freight $14,050

2 entomologists to conduct an environmental impact evaluation of pesticides $46,550

Aerial spray support personnel $1,155

FY 87

Additional cost of large-plane operation $518,993

Additional cost of 6-member team $8,985

Management support $4,546

20 drums of aircraft fuel from Neslo Petroleum and air freight $11,282

Local support of large-plane operation $226,000

Attendance of 5 experts at OFDA Lessons Learned meeting in November 1986 . . . $3,260

Total OFDA FY 86 . . . . . $1,626,973
Total Africa Bureau FY 86 . . . . . $75,000

Total FY 86 . . . . . $1,701,973

Total OFDA FY 87 . . . . . $773,066

TOTAL $2,475,039

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

International Organizations

African Development Bank — provided $165,000.

EC — donated $650,000.

FAO — provided $156,000 for training of Crop Protection Service agents, vehicle repairs, and experts.

UNDP — donated 25,000 liters of fenitrothion, valued at $200,000.

Governments

Canada — provided $1,700,000 for 85,000 liters of fenitrothion, 4 small planes and fuel costs, ground support, and training.

Denmark — provided $110,000 for repair of OCLALAV planes.

France — provided pesticides and an operations expert, valued at $100,000.

Germany, Fed. Rep. — provided $300,000 for 40 MT of propoxur, 14,000 liters of fenitrothion, and ground support for the large-plane operation.

Italy — donated equipment and 5,000 kilos of pesticides, valued at $800,000.

Japan — provided 100 MT of fenitrothion and vehicles, valued at $800,000.

Sweden — provided $50,000 for repair of OCLALAV planes.

United Kingdom — donated $70,000 for pesticide sacks, 1,000 liters of fenthion, and support for the large-plane operation.

TOTAL $5,101,000

The Gambia

Not only were the rains very late in coming to the Gambia in 1986, but they were far below normal for the season. However, during the first two weeks of August, rainfall increased, leading to the hatching of grasshoppers. By late August, there were reports of increased levels of infestation, particularly in the Western Division. Survey samples indicated as many as 18,600 grasshoppers per ha. Later, significant infestation was reported in the divisions of North Bank and McCarthy Island near the Senegalese border as well. About 70 percent of the grasshoppers sampled were *Oedalus senegalensis;* other species included *Cataloipus fuscocorulipes* and *Numbe tenuicornis.* The Gambia Crop Protection Service (CPS) started its month-long ground spraying program on September 25, concentrated in the Western Division. The eight ground teams treated a total of 11,500 ha using fenitrothion, cymbush, and propoxur. The Government of the Gambia (GOTG) provided an equivalent of $47,568 for the operational costs of the CPS ground spraying teams.

A steering committee, chaired by the FAO representative, was established in September. Members included representatives from the Gambia Departments of Agriculture and Crop Protection, the EC, U.K., USAID, UNDP, and China. When it became apparent in mid-September that the infestation was too serious to be controlled using ground treatments alone, the committee called for an aerial spray program. As in Senegal, the program comprised the use of both small and large planes. Canada and the EC provided five small planes, the U.S. provided the three DC-7s which were stationed in Dakar, while other donors contributed pesticides, fuel, operating costs, and equipment. The GOTG provided vehicles, fuel, and personnel to work with the aerial spray teams. The U.S. contributed $25,000 through FAO for equipment and local costs as part of its Sahel program. In addition, on October 14, 1986, U.S. Ambassador Hennemeyer declared the infestation a disaster. This facilitated the disbursement of funds for the U.S. portion of the aerial program.

The aerial program was conducted as follows:

Donor	Dates of Treatment	Area Treated
EC	10/19-10/30	77,800 ha
USAID	10/19-10/20	79,170 ha
Canada	10/21-10/28	90,740 ha
	Total	247,710 ha

The EC plane sprayed 5,500 liters of fenitrothion, 1,300 liters of malathion, and 6,700 liters of diazinon; the four Canadian planes used 24,300 liters of fenitrothion; and the three U.S. DC-7s used 69,273 liters of malathion 91 percent ULV.

A multi-donor evaluation team (with one U.S. member) sponsored by the FAO visited the Gambia in late November. The team concluded that the aerial spraying operation would have been more effective if it had taken place earlier in the season. By the time aerial spraying had begun, a large number of eggs were already in the soil. Therefore, if rains are adequate in the 1987 season, another large-scale control program might be necessary.

Summary of USG Assistance

(Please note: assistance was provided through OFDA unless otherwise indicated.)

FY 86

Grant to FAO for local operating costs ($10,383) and 2 large sprayers ($15,070) $25,453

FY 87

Cost of DC-7 spraying operation (T & G Aviation) $148,260

68,178 liters of malathion from Cyanamid Corp $218,308

Crew readies backpack sprayers for ground treatment of grasshoppers.

8 drums of aircraft fuel from Neslo Petroleum $1,600

Air freight of malathion and oil by UPS $199,923

Total OFDA FY 86 ..... $25,453

Total OFDA FY 87 ..... $568,091

TOTAL $593,544

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

International Organizations

EC — provided a plane for spraying 77,800 ha and 10,000 liters of diazinon, valued at $500,000.

FAO — provided 6,000 liters of fenitrothion and operating costs, valued at $51,000.

UNDP — contributed $20,000 for general expenses.

Governments

Canada — provided 4 planes and fuel to spray 90,740 ha, valued at $150,000.

China, People's Rep. — contributed 5,000 liters of fenitrothion, valued at $50,000.

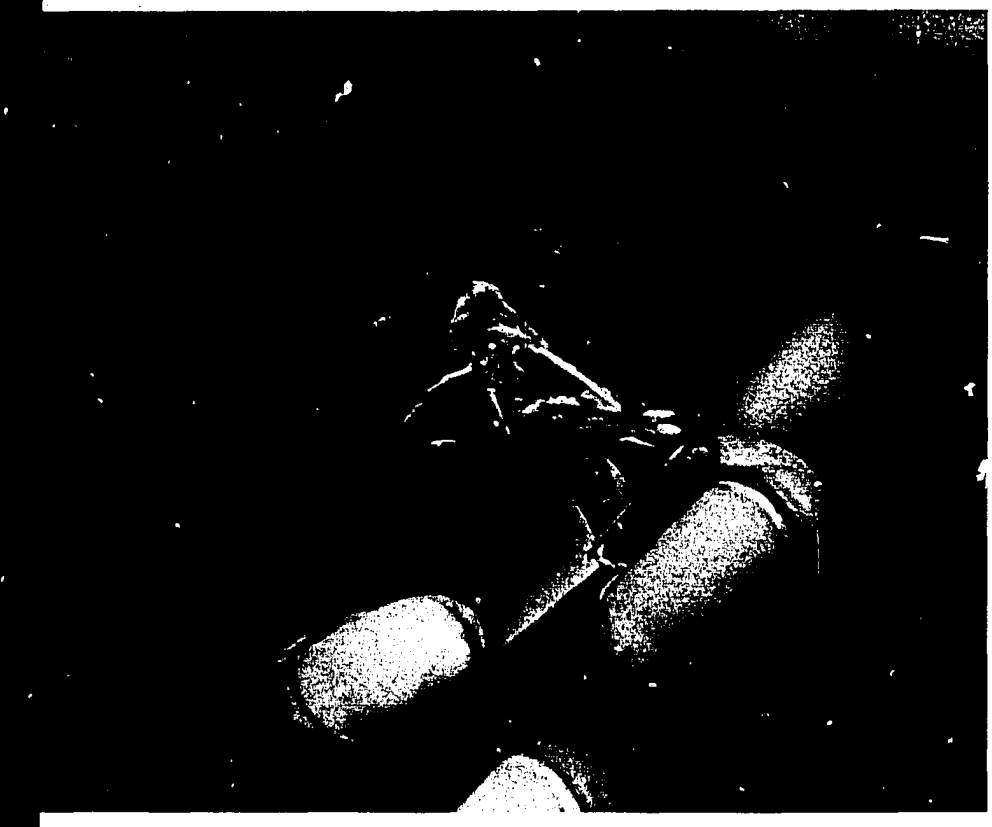
Germany, Fed. Rep. — provided 7,000 liters of fenitrothion, valued at $100,000.

Italy — contributed equipment, sprayers, and operational costs, valued at $40,000.

Japan — paid $72,000 toward the cost of the Canadian plane operation.

United Kingdom — provided 40 MT of propoxur and part of the cost of the Canadian plane operation, valued at $260,000.

TOTAL $1,243,000



Oedaleus senegalensis *is the major grasshopper pest in West Africa.*

Mali

Mali experienced a serious outbreak of grasshoppers with the return of the rains in September 1985. The pests affected 12,000 ha of cultivated millet and endangered another 30,000 ha in Nara *cercle.* In late September, reports indicated that the infestation had spread to an additional 200,000 ha and put at risk 20,000 ha of mostly cultivated millet in the area north of Kayes. Grasshopper counts reached 100 per sq. m around Yelimane, while in the area between Nara and Dilly three swarms up to four km wide each were sighted.

As the millet crop in Region I matured and natural vegetation dried, the grasshoppers moved southwest along the receding Senegal River and its tributaries. The dominant species in the humid areas was *Hieroglyphus* accompanied by large numbers of *Oedalus.*

Meanwhile, a menacing increase in the population of another pest, the *Quelea quelea* bird, occurred in October 1985. The birds threatened 40,000 ha of irrigated rice in the Office du Niger and the Niger River delta region. The total area occupied by the *Quelea quelea* was at least 380 ha, with average bird populations of 60,000 to 100,000 per ha.

The primary organizations involved in controlling pest infestations in Mali were the FAO, the Malian Crop Protection Service (CPS), and the two regional pest control organizations, OICMA and OCLALAV. In early September, an FAO expert (George Popov) assisted the GRM in putting together a plan of action to attack the grasshopper infestation. The plan included both ground and aerial spraying and implementation was estimated to cost a total of $543,000. To launch the pest eradication campaign, the GRM paid OICMA $24,000 for the use of its two airplanes, and contributed an additional $293,000 for insecticides, equipment for five ground spraying teams, fuel, personnel, and transport. The GRM then requested FAO to finance the remaining program costs of $226,000.

In September, the total cost of the control program was revised upward to $866,610. Consequently, on October 1, 1985, the Ministries of Interior and Agriculture convened the donor community to appeal for greater assistance than that already provided by FAO.

On October 2, 1985, U.S. Ambassador Robert J. Ryan Jr. declared the grasshopper infestation in Mali to be a disaster. USAID/Bamako contributed $25,000 for the GRM's ground and aerial reconnaissance of grasshoppers in the Yelimane-Kayes area and of birds in the Office du Niger and Niger River delta areas.

The CPS and OICMA sprayed the following areas:

	Area	Pesticides
Nara-Dilly	95,000 ha	28,700 liters
Yelimane-Kayes	44,000 ha	22,600 liters
Niafunke	7,000 ha	2,400 liters
Total	146,000 ha	53,700 liters

The pesticides used included propoxur in powder form, a dieldrin fenitrothion solution, and lindane. Dieldrin maintains its killing effect for three to four weeks whereas the immediate killing effect produced by fenitrothion decimates the target population. However, di-

eldrin and lindane are severely restricted in the U.S. because of the effects of pesticide residue and environmental and food contamination. Because of the problems connected with using dangerous pesticides, A.I.D. and FAO co-funded an experimental spray testing program in the Kayes area to determine the efficacy of alternative, safer, EPA-approved pesticides. Much of this testing took place in the spring of 1986.

Although millet and sorghum suffered considerable losses — up to 25 percent in parts of the infested areas — the grasshopper control program saved a major part of the crop in the affected areas and prevented further southward migration of the grasshopper swarms.

As for the bird infestation problem, CPS and OCLALAV specialists began reconnaissance on October 15 in the Niger River delta area; air treatment using the avicide fenthion began in mid-November. *Quelea quelea* bird control is both complicated and dangerous. Aerial spraying must be done at night when the birds come back to roost. The airplanes used must be easily maneuverable in order to encircle the flocks, which are startled in their roosts and fly in all directions. After flying through a flock of birds on November 26, a pilot was unable to accurately spot his runway and damaged the OICMA plane (fortunately, the pilot was not hurt). Despite the dangers and problems, the spraying operation was generally successful.

After the control program, USAID/Bamako and OFDA sponsored a fact-finding survey to determine how A.I.D. could help prevent future grain losses due to pests. OFDA contracted a pest control specialist, Dr. Gustave Mathys, to go to Mali for 45 days in October and November 1985. Working with USAID/Bamako, FAO, and the CPS, Dr. Mathys observed field control operations, collected 21 soil and plant samples, interpreted plant residue laboratory analyses, and made recommendations concerning the use of pesticides considered unsafe in the U.S. His report was shared with A.I.D./Washington, the U.S. Mission in Bamako, FAO, and the Malian government.

The apprehension at the end of the 1985 control program that the grasshopper infestation problem would be even worse in 1986 proved to be justified. The grasshoppers were able to lay a large number of egg pods before they were sprayed. During the first week of August 1986, USAID/Bamako reported that moisture conditions were favorable for the emergence of grasshoppers throughout much of Mali north of 13° N and that this had led to massive successive hatchings of grasshoppers across the Sahel zone. The predominant species was the grasshopper *Oedalus senegalensis*, with an outbreak of African migratory locusts reported in the Niger delta east of Mopti. Most farmers were caught unprepared and many had to seed their fields four to five times. In August, the situation calmed considerably, as the rains nearly stopped for close to three weeks. However, by September the renewed rains were leading to a second and third round of hatchings. The grasshopper populations posed a serious threat to ripening millet and sorghum crops, especially in northwestern Mali and southeastern Mauritania. If not controlled, the grasshoppers would lay eggs, setting the stage for yet another infestation in 1987.

After the rains began in 1986, the Malian CPS convened the donor community to develop a control strategy. The result was a two-phase program: first, ground-based treatments would be conducted by both CPS units and farmers; and second, aerial spraying would begin at the end of the season to treat migrating swarms. Unfortunately, the first phase was largely ineffective because donor commitments arrived too late (most important, only 50 of the 500 MT of pesticides ordered had arrived by the time the rains came) and because the magnitude of hatchings was greater than anticipated. The result was extensive damage to early plantings and a far greater need for aerial treatment.

By early August 1986, the situation had become critical, and on August 5, U.S. Ambassador Robert J. Ryan Jr. declared a disaster. Donor countries and the FAO worked together with Malian officials to develop an aerial intervention program. To this end, A.I.D./Washington sent an assessment team and the U.S. Mission in Bamako hired an entomologist. The five-member team assembled to investigate the situations in Mali and Mauritania comprised an OFDA team leader, an operations specialist, a logistician, and two entomologists, all from the U.S. Forest Service. The team worked together with the U.S. Mission and other donors, particularly the French, setting in motion the acquisition of two helicopters and three small fixed-

wing aircraft to treat an estimated 100,000 ha in northwest Mali and another 20,000 ha in southeastern Mauritania.

For the joint U.S./French spraying operation, the French deployed two commercial spray helicopters, two support trucks, and crews from Ivory Coast. The USG contributed 200 hours flying time, per diem for flight crews, fuel, 50,000 liters of fenitrothion, radios, and support services. Spraying began in the U.S.-assigned zone of intervention, in the area of Balle-Nara-Mourdiah, on August 30. Meanwhile, the Norwegians and Canadians provided small aircraft and pesticides for the zones of intervention assigned to them, the Kayes-Yelimane-Nioro area, and the Dutch concentrated their funds to help the Malian CPS work in the Mopti-Rharous zone.

However, the infestation proved to be greater than anticipated and in early October, an estimated 100,000 ha in northwest Mali and 40,000 ha in southeastern Mauritania still needed to be treated. As the "spraying window" was rapidly closing, there was not enough time to use only small aircraft. Therefore, both the Malian and Mauritanian governments decided to make use of the big-plane option in addition to extending the use of the small aircraft. The three U.S.-provided DC-7s, operating out of Dakar, sprayed 20,000 ha each in Mali and Mauritania on October 14. All aerial spraying in Mali came to a close by late October. The following is a breakdown of the hectarage sprayed in Mali:

	Total Sprayed	USG-sprayed
Small planes	383,031 ha	163,038 ha (43%)
Large planes	20,000 ha	20,000 ha (100%)
Total	403,031 ha	183,038 ha (45%)

As the chart shows, the USG was responsible for almost half the area sprayed. By all accounts, the international treatment effort was successful in preventing late-season major crop losses. Kill rates varied from 80 to 95 percent with mortality high from all formulations of pesticides used (fenitrothion ULV 50, fenitrothion ULV 100, and malathion 96 p.c. ULV). However, the threat of a similar recurrence next year remains largely because of residual egg pods. Egg pod surveys will be carried out in early 1987 to try to determine the extent of the problem.

Summary of USG Assistance

(Please note: assistance was provided through OFDA unless otherwise indicated.)

FY 86

Ambassador's Authority (October 1985 declaration) donated to the GRM for ground and aerial reconnaissance of grasshoppers and birds $25,000

Cost of a pest control specialist to assess control program and pesticide use $44,790

Experimental spray testing program (A.I.D./Africa Bureau funds) $90,000

Ambassador's Authority (August 1986 declaration) used to hire the services of an entomologist (Ian McKay) already resident in Bamako $25,000

5-person multi-disciplinary team $38,622

Travel and administrative expenses of OFDA team leader (from OFDA travel budget). $7,660

Grant to FAO for equipment ($19,003), 6 sprayers ($44,481), and 18 radios ($24,524) $88,008

Local support costs for French helicopters $240,000

Flying time for three small aircraft .. $260,000

50,000 liters of fenitrothion from Sumitomo in Texas $260,000

Air freight of fenitrothion $158,460

15 radios from N & G Distributing Co. (Miami) and air freight $26,985

FY 87

Extension of support of small-plane operation $104,000

60,000 liters of malathion (147 drums) from Cyanamid Corp $199,305

Air freight of malathion $158,030

Attendance of 3 experts at OFDA Lessons Learned meeting in November 1986 ... $1,535

Total OFDA FY 86 ..... $1,174,525
Total A.I.D./Africa Bureau FY 86 .... $90,000

Total FY 86 ..... $1,264,525

Total OFDA FY 87 ..... $462,870

TOTAL $1,727,395

Assistance Provided by U.S. Voluntary Agencies

WVRO — contributed $25,000 in support of the large-plane operation.

TOTAL $25,000

Assistance Provided by the International Community

International Organizations

EC — provided $170,000 in cash; $125,000 to purchase pesticides; and $450,000 for 35,000 liters of fenitrothion, 344 MT of 25 percent BHC, 3,000 liters of fenthion, and 1,000 manual dusters.

FAO — contributed $238,000 to the GRM for the 1985 grasshopper and bird control program; for the 1986 campaign, donated $80,000 for equipment and support of the Band Aid-provided aircraft; $40,000 for pesticide testing jointly carried out with the U.S.; $70,000 for aircraft repair and salaries; $145,000 for operating costs; $250,000 for other costs; and a logistican.

UNDP — donated $160,000 for ground and aerial treatment in the Yelimane-Kayes area, and $200,000 for 5 Land Rovers and 170 MT of 25 percent BHC.

Governments

Canada — provided $500,000 for 11,000 liters of fenitrothion and flying time for small aircraft.

China, People's Rep. — donated 5 MT of fenitrothion, value not reported.

France — provided $300,000 for 20,000 liters of fenitrothion, and $150,000 for the services of a helicopter pilot for two months.

Germany, Fed. Rep. — donated 2,500 kg of propoxur and 2,025 liters of fenitrothion, value not reported.

Italy — provided $259,000 for the use of ten trucks.

Netherlands — donated $600,000 for 70,000 liters of pesticides.

Norway — provided $1,202,000 for flying time of three aircraft, 45,000 liters of fenitrothion, a coordinator, and ground support.

United Kingdom — provided $285,000 for 25,000 liters of fenitrothion and 20 Unimog tires.

Non-Governmental Organizations

Band Aid — provided $625,000 for a Britten Norman Islander airplane.

Stromme Memorial Foundation (Norwegian NGO) — helped with the spraying operations in the Kayes-Yelimane-Nioro area.

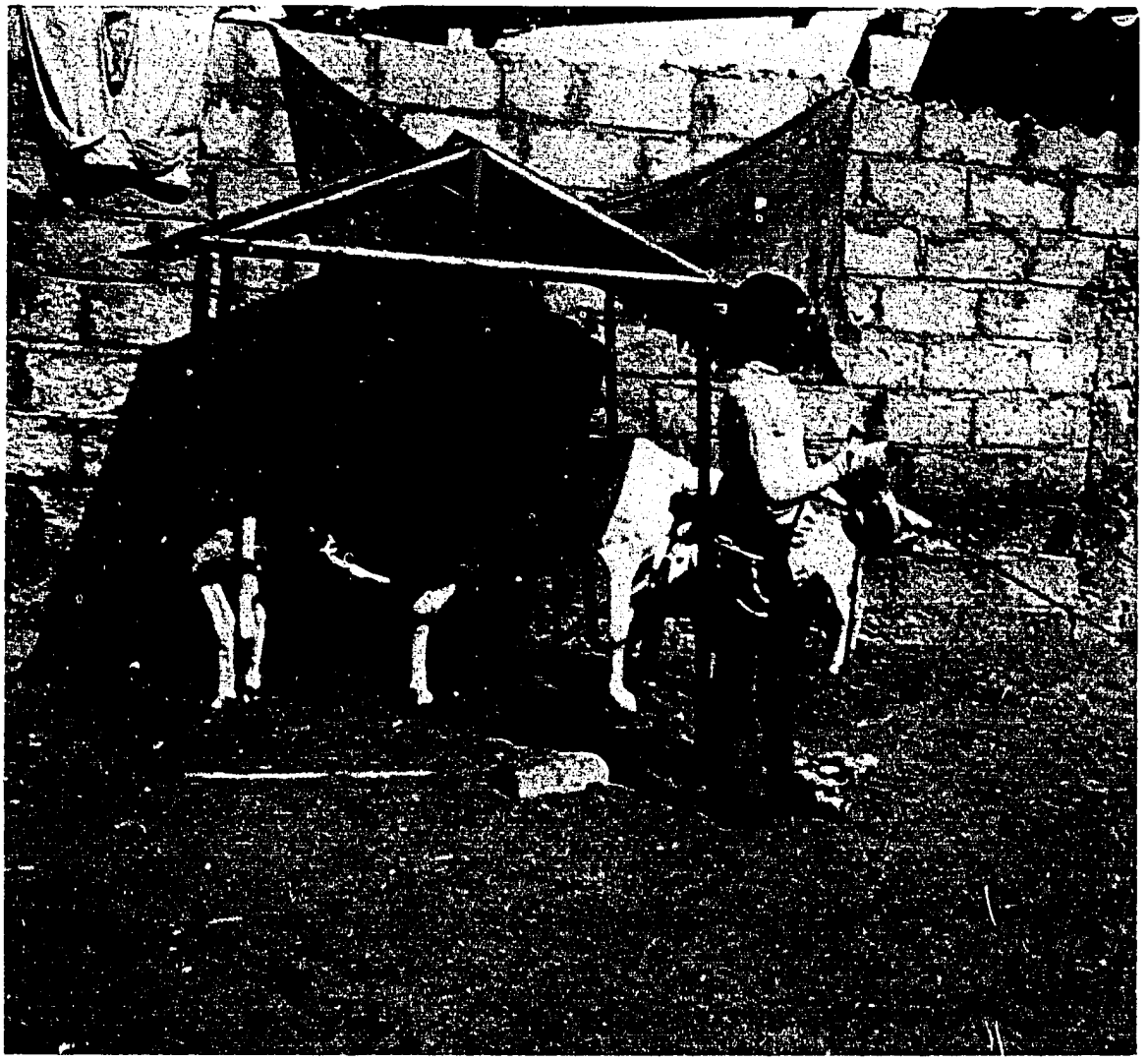
TOTAL $5,849,000

Mauritania

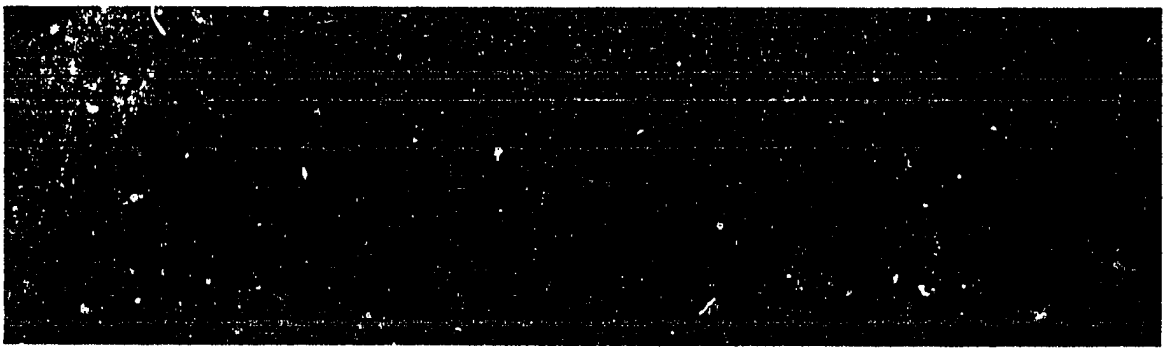
Mauritania suffered from grasshopper attacks in 1985 and lost an estimated 20 to 25 percent of its rainfed cereal grain crop. Mauritania's Ministry of Rural Development (MRD) began preparing for the 1986 outbreak as early as October 1985. Because of this early preparation, the high caliber of the MRD's Crop Protection Service (CPS), and the close cooperation between the Mauritanian government and the FAO representative, the Mauritanians were able to implement effective control measures with relatively little outside assistance.

Ground control operations were carried out by 11 CPS mobile intervention teams. The teams were responsible for surveying and reporting, farmer training, pesticide distribution to farmers, and intervention with pesticide applications when infestations became generalized and surpassed farmers' means. Propoxur (618 MT), sprayers, dusters, and fuel were pre-positioned and distributed to farmers in affected regions before the rainy season. Together farmers and CPS teams treated close to 100,000 ha.

However, the infestation was serious enough, particularly in the southeast near the Malian border, to require aerial spraying and donor help. The first donor operational meeting in Nouakchott was convened on July 30; the group continued to meet throughout August, September, and October. Meetings were chaired by the Directorate of Agriculture, assisted by the FAO representative, and attended by representatives from the MRD, USAID, UNDP, EC, Mauritanian Red Cross, West Germany, France, Algeria, Morocco, CARE, World Vision, and the World Bank. The coordinating committee received high marks from all concerned with no disputes among its members regarding the course of action to take.



The aerial spraying program decided upon by the Mauritanian government, with input from the donors, was conducted in the southern part of the country, where the swarms threatened Mali and Senegal as well as Mauritania. The following chart summarizes the aerial program:



The insecticides used were fenitrothion (50 ULV and 96 ULV formulations), malathion (50 ULV and 90 ULV formulations), and diaznon 90 ULV. Aerial treatments in all sectors were generally highly effective. Grasshopper kill rates were greater than 90 percent. All in all, the grasshopper control campaign in Mauritania was one of the most effective in the Sahel in terms of both effectiveness and donor coordination.

In late November 1986, a different and more voracious pest threatened Mauritania — the desert locust. The coordinating committee dispatched the EC-financed Pawnee spray plane to Tidjikja with fuel and insecticide to spray 17,500 ha. Five ground crews, using spray vehicles and a Unimog, treated 4,000 ha. In mid-December, two Grumman Ag-cat spray planes provided by Algeria were on stand-by in Nouakchott in case the locusts migrated. The U.S. also provided $160,000 through the FAO Sahel grant to purchase additional pesticides to fight the desert locusts.

Summary of USG Assistance

(Please note: assistance was provided through OFDA unless otherwise indicated.)

Although U.S. Ambassador Robert L. Pugh did not declare a disaster until September 27, 1986, the USG had already contributed toward the grasshopper control program through grants to FAO and technical assistance (some of the team members OFDA sent to assess the situation in Mali also went to Mauritania).

The value of the technical assistance is included under assistance provided to Mali, while the value of the DC-7 spraying operation is included under assistance provided to Senegal because the venture was directed from Dakar.

FY 86

Grant to FAO for equipment ($11,101), two sprayers ($15,050), 14 radios ($18,813), and local costs ($70,739) $115,703

Ambassador's Authority used for the local purchase of fuel $25,000

Grant to FAO for 25,270 liters of fenitrothion 50 percent ULV for desert locust campaign (this money was obligated to FAO in FY 86 but not allocated to Mauritania until FY 87) $160,277

FY 87

Support of small-plane operation in southeastern Mauritania $170,000

Total OFDA FY 86 ..... $300,980

Total OFDA FY 87 ..... $170,000

TOTAL $470,980

Assistance Provided by U.S. Voluntary Agencies

CARE — provided ground crew support, valued at $13,000.

CRS — provided ground crew support, value not reported.

WVRO — provided ground crew support, value not reported.

TOTAL $13,000

Assistance Provided by the International Community

Algeria — provided the use of 2 airplanes (U.S.-made Grumman Ag-cat spray planes, which arrived in November 1986), valued at $50,000.

EC — contributed 25,000 liters of fenitrothhion and 38,200 liters of diazinon, valued at $600,000; provided $1,000,000 for flying time of 2 small airplanes (one for liaison and one for spraying) and a helicopter (for treatments and survey), which together treated 114,600 ha in southwestern Mauritania.

FAO — donated $166,000 and provided invaluable technical assistance and coordination help.

France — provided $68,493 for pesticides and support of aerial spraying campaign.

Germany, Fed. Rep. — contributed 50 MT of propoxur and other pesticides, valued at $625,000.

Italy — provided 4,000 liters of synthetic pyrethroids, valued at $40,000.

Morocco — donated 6 Land Rovers and 3,000 liters of diesel fuel, valued at $150,000.

Norway — provided 3 airplanes for spraying in southeastern Mauritania, value not reported.

United Kingdom — donated 1,000 liters of fenthion, valued at $7,500.

TOTAL $2,706,993

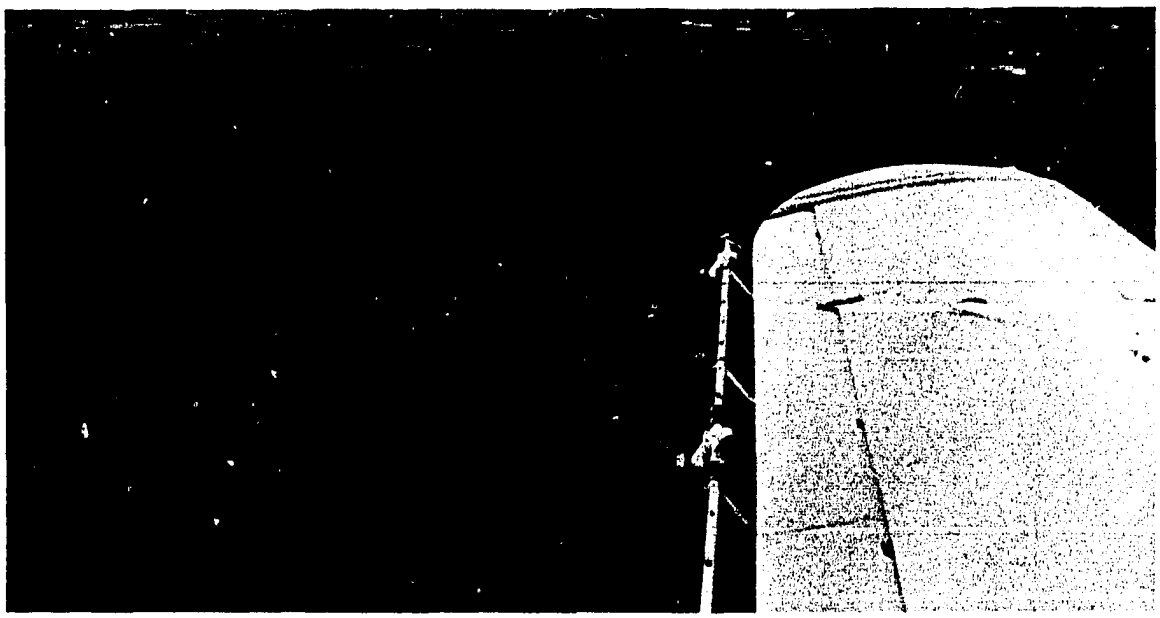
Burkina Faso

In June 1986, the Government of Burkina (GOB) requested urgent assistance from the international community to combat an expected outbreak of grasshoppers. The GOB Minister of Agriculture and Livestock, whose educational and practical background was in pest management, called a donors' meeting on June 13 to outline the problem and the GOB's plan of response. The meeting was attended by representatives from France, the U.S., the Netherlands, West Germany, Canada, Algeria, the EC, the World Bank, UNDP, FAO, and CILSS (an organization of West African states). The immediate area at risk was estimated at 250,000 ha in the northern and eastern areas of Burkina, particularly from the Sourou province in the west to the Niger border, and from the border with Mali to a line running east-west through Yako and Kaya. In some locations, the density of grasshoppers reached over 100 per sq. m.

Burkina was one of the three Sahelian countries (the others being Mauritania and Niger) which implemented effective ground control programs. Ground control efforts were already underway before June, managed by the Plant Protection Service (PPS), which receives technical and material support from Canada. Popular participation in the control effort was strongly encouraged and a reported 10,000 villagers were trained in grasshopper identification and control activities. Articles on the infestation appeared frequently in the press. Farmers and ground teams treated a total of 20,893 ha in the 1986 campaign; the areas treated were Djibo, Dori, Oahigouya, Dédougou, Bogandé, and Kongoussi.

Although Burkina's ground treatment program was timely and relatively effective, the magnitude of the problem, as in the rest of the Sahel, required an aerial program as well. U.S. Ambassador Leonardo Neher declared a disaster on June 26, 1986. Immediate assistance from A.I.D./Washington was provided to purchase air filters and provide support for the ground program. In addition, USAID/Ouagadougou requested the services of an entomologist to help formulate an appropriate action plan. A.I.D./Washington dispatched Duane Bartholf, an entomologist retired from the USDA, on August 15 for two months. Because the situation in Burkina appeared to be adequately managed, A.I.D./Washington did not send out a team of experts; however, A.I.D.-funded technical experts sent to Senegal also made excursions to Burkina to give technical advice when necessary.

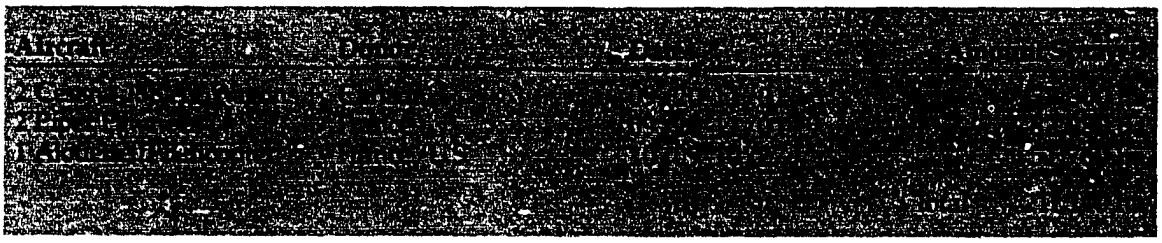
The GOB held a donors' meeting on August 22 to discuss the aerial spraying strategy. The GOB response plan called for 100,000 ha total to be treated by ground operations and 100,000 ha by



aerial operations. However, donors noted that the time would be insufficient to treat 100,000 ha from the ground and that the total aerial program should be closer to 200,000 ha. The aerial spraying program needed to be mounted within a month and required training Burkinabe staff, purchasing and mobilizing materials and resources, repairing airstrips, and establishing a system to identify, mark, and spray grasshopper outbreaks over a 121,000 sq. km area. Mr. Bartholf and the FAO representative were assigned to help the GOB develop an action plan. Later, a French aerial treatment specialist arrived to help with the plan and its implementation.

The possibility of using the U.S.-supplied DC-7s stationed in Dakar to spray much of the infested area was put forward, but the donors and experts agreed that there was insufficient data to justify a large-plane operation. Instead, donors contributed four small airplanes and a helicopter to spray 210,000 ha in Dori, Oahigouya, and Djibo. The following chart gives the distribution of aerial treatment by aircraft.

Fenitrothion was the major pesticide used in the campaign. As in most other parts of the Sahel, the main problem with the aerial program was that it did not take place soon enough. Many grasshoppers were able to lay eggs before treatment occurred. The lack of proper communications equipment also hampered operations. However, this was the first aerial treatment program the GOB had ever mounted and lessons learned will be incorporated into the 1987 campaign.



Summary of USG Assistance

(Please note: assistance was provided through OFDA unless otherwise indicated.)

FY 86

Local purchase of 25,000 air filters, local transport, and airport fees; all for ground control program $25,000

Entomologist (Duane Barthолf) for 75 days (8/15-10/23) (A.I.D./Africa Bureau funds) $55,000

Grant to FAO for equipment ($12,064), 18 radios ($26,308), 3 ULV sprayers ($23,050), and local costs ($20,419) $81,841

Administrative support (A.I.D./Africa Bureau funds) $5,800

Support of French Alouette II helicopters (50 hours of flying time, fuel, per diem for crew) $120,000

Flight suits, gloves, and hard hats from the U.S. Forest Service and air freight $657

FY 87

12 3,000-gallon water tanks from Leghorn (Italy) stockpile (originally intended for the 1985-86 drought disaster in Burkina, they were donated to the grasshopper control effort) $29,277

Total OFDA FY 86 ..... $227,498
Total A.I.D./Africa Bureau FY 86 .... $60,800

Total FY 86 ..... $288,298

Total OFDA FY 87 ..... $29,277

TOTAL $317,575

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance provided by the International Community

International Organizations

EC — donated 18,720 liters of fenitrothion, valued at $201,310.

UNDP — provided 100 MT of propoxur, valued at $110,000; 13,000 liters of diazinon, valued at $130,000; 45 motorized knapsack sprayers, valued at $22,500; 60,000 dusting sacks, valued at $30,000; 50 camp beds, valued at $2,000; 100 sets of protective clothing, valued at $10,000; $20,000 for operating costs; 2 4-wheel-drive vehicles, valued at $24,000; a load carrier, valued at $25,000; 25 motor bicyclettes, valued at $2,500; and $8,500 for training.

UNICEF — contributed $50,000 for generators, operating costs for a truck, camp supplies, and local support costs.

WFP — donated 5,000 liters of vehicle fuel, valued at $8,000; and $10,000 for the operating costs of five loaned load carriers.

Governments

Canada — provided the use of 2 Cessna spray airplanes, valued at $138,000; and 4,000 liters of diazinon, 147 MT of propoxur, and 20,000 liters of fenitrothion, all valued at $320,000.

France — donated the use of 2 Piper Pawnees, valued at $77,000; air freight for the Alouette II helicopter to Burkina, valued at $31,000; $16,000 for camp supplies and other support equipment; $46,000 for operating expenses; logistics expert, value not reported; and survey experts from the French agency of PRIFAS, valued at $7,000.

Germany, Fed. Rep. — contributed 100 MT of propoxur, valued at $150,000; 3 Unimogs with mist blowers, valued at $120,000; protective clothing, value not reported, and technical assistance, value not reported.

Italy — provided 6,000 liters of fenitrothion, 3,000 liters of synthetic pyrethroids, and 40 MT of propoxur, all valued at $100,000; and 41 motorized dusters, 300 pump dusters, 140 backpack dusters, 1,060 hand dusters, and protective clothing, value not reported.

Japan — donated 180 MT of fenitrothion dust and 15,000 liters of fenitrothion liquid, value not reported.

Netherlands — provided 15,000 liters of fenitrothion, valued at $180,000.

TOTAL $1,838,810

Chad

The USAID Mission in Ndjamena began receiving reports in late July of a steadily worsening infestation problem. An FAO entomologist surveyed the Lake Chad region July 20 and confirmed the presence of African migratory locusts, a potentially alarming fact. The Senegalese grasshopper was found in large numbers in the Sahelian zones of Chad in Ouaddai, Batha, and Guera prefectures. These grasshoppers ate a significant amount of millet in Adré. An infestation of rats also threatened food crops.

Chadian government resources were wholly inadequate to fight the grasshopper and rodent threat. Chad had no pesticides, no spraying equipment, and only a handful of people experienced in insect control. At a donors' meeting on July 23, the FAO representative and Chadian Crop Protection Service (CPS) personnel outlined a program of action and requirements. It was too late for the first period of control, July to early August, so all resources were to be concentrated in the second period, September to October. The FAO and CPS estimated that 300,000 ha needed to be treated; 40,000 by farmers using dust bags, 100,000 by ground spraying using vehicle and backpack sprayers, and 160,000 by aerial spraying. The projected cost of the program was $2,137,000 for pesticides, flight time, dust bags, vehicles, back sprayers, protection equipment, training, and operating costs.

After U.S. Ambassador John Blane declared a disaster on July 25, 1986, the USG contributed $725,000 (later increased by $181,000) to the FAO for fenitrothion, helicopter flying time, sprayers, radios, maps, and operating costs as part of the overall program. In addition, USAID/Ndjamena requested the services of an entomologist for two months.

A.I.D./Washington located a French-speaking entomologist with experience in Africa to go to Chad for the entire control program (Carl Castleton). OFDA also identified a team of six experts to develop an action plan for the U.S. Mission. Both the team and the entomologist arrived on August 11. The team consisted of an OFDA team leader, an operations specialist, logistican, and entomologist from the U.S. Forest Service, and a communications specialist from

Only the stalk of the plant remains after locusts devoured the kernels and leaves.

the Bureau of Land Management (U.S. Department of Interior). Mr. Castleton trained thirty CPS extension agents in modern survey methods. He also helped manage the Chadian control program and attended all the donor meetings. He worked closely with the six-member team, which developed an operational strategy paper and calendar for the Chadian government and donors. This plan called for a program of complementary ground and aerial control measures. The strategy for the USG-funded part of the aerial program called for a two-pronged approach: immediate spot treatment of the Lake Chad area to eradicate the localized migratory locust outbreak, followed by a more extensive campaign to control the adult grasshopper population threatening cereal harvests in the Sahelian and Sudanian zones. The aerial program, originally set to treat 54,500 ha and later augmented to 160,000 ha, was to start no later than September 22 and finish in mid-November.

For the top priority treatment of the locust infestation around the Lake Chad area, FAO contracted the services of a helicopter. This helicopter began spraying on September 17 and successfully treated 44,075 ha over the next month, halting both the locust and grasshopper infestations in that region.

Unfortunately, FAO's attempts to contract airplanes for the grasshopper campaign in the rest of Chad did not go as smoothly. Two planes were hired from UTAVA, the Cameroon bird control agency, to begin spraying in early September. However, disputes between the Government of Chad (GOC) and UTAVA (regarding liability insurance, pilot licenses, and other issues) delayed the start of the campaign until September 26. The UTAVA planes treated 36,600 ha, slightly more than one-third the amount contracted, and then returned to Cameroon for a presentation ceremony. At this point, the GOC cancelled the rest of the contract. After that, the French were able to furnish a plane on October 8; it sprayed 67,175 ha by the time it finished on November 20.

A total of 147,850 ha was treated aerially, a shortage of 12,150 ha from the target amount. This treatment program prevented extensive damage to standing crops (the estimate of crop losses was 10 to 18 percent). However, because of the ineffectiveness of the ground control program and the late start and delays in aerial spraying, many of the adult grasshoppers were able to lay eggs before they were killed. Thus, if weather conditions are favorable to grasshoppers hatching in 1987, a control campaign of equal or greater magnitude will have to be mounted.

Summary of USG Assistance

(Please note: assistance was provided through OFDA unless otherwise indicated.)

FY 86

Grant to FAO for control program . . . $906,000

FAO used the grant as follows:

helicopter survey and spraying	$137,651
local expenses	$128,177
fenitrothion 96 percent ULV	$554,619
equipment	$7,158
sprayers	$17,400
radios	$15,656
maps	$200
pesticide quality control	$1,180
uncommitted funds	$43,959

Support of personnel and publication of training manual (A.I.D./Africa Bureau funds) $50,000

Services of entomologist (Carl Castleton) for 60 days (A.I.D./Africa Bureau funds) ... $33,612

Team of 5 experts $28,200

OFDA team leader (from OFDA travel budget) $3,750

Goggles, pails, pumps, funnels, paper towels, tape, first aid kits, insect repellent, flashlights, sleeping bags, batteries and other miscellaneous items from the U.S. Forest Service, plus air freight $6,641

FY 87

Attendance of 3 experts at OFDA Lessons Learned meeting in November 1986 ... $1,505

Total OFDA FY 86 ..... $944,591
Total A.I.D./Africa Bureau FY 86 .... $83,612

Total FY 86 ..... $1,028,203

Total OFDA FY 87 ..... $1,505

TOTAL $1,029,708

Assistance Provided by U.S. Voluntary Agencies

CARE — loaned a 4-wheel-drive vehicle, value not reported.

Food for the Hungry International — donated $5,000 for operating expenses.

WVRO — provided $1,800 for fuel.

TOTAL $6,800

Assistance Provided by the International Community

International Organizations

EC — donated $551,212 for 60 MT propoxur, 81,200 liters of fenitrothion, 5,500 liters of diesel fuel, insect collection equipment, and operating expenses.

FAO — provided $215,000 for pesticides, vehicles, and spraying equipment.

UNDP — contributed $30,000 for operating expenses.

Governments

France — provided flying time for an aerial spray plane, valued at $100,000.

Germany, Fed. Rep. — donated $738,000 for pesticides.

Italy — provided sprayers, dusting bags, and propoxur, valued at $100,000.

Netherlands — provided airplane flying time, 40 MT propoxur, and 5,000 liters of fenitrothion, all valued at $200,000.

Switzerland — contributed $113,000 for dusting bags, ground sprayers, protective equipment, and training.

United Kingdom — provided three Land Rovers and pesticides, all valued at $110,000.

Non-Governmental Organizations

Band Aid — provided $96,000 for rodenticides, operating expenses, and flying time.

ICI (U.K.) — donated $36,000 for rodenticides.

Oxfam/U.K. — contributed $56,000 for pesticides and operating expenses.

TOTAL $2,345,212

Infestation

Nymphs of desert locusts (Schistocera gregaria)

Ethiopia and Sudan were the two countries most affected by the African drought of 1984-85. The rains that ended the drought also produced favorable breeding conditions for a variety of pests, including armyworms, grasshoppers, desert locusts, tree locusts, and African migratory locusts. The most destructive of these pests is the dreaded desert locust *(Schistocerca gregaria).* A swarm of desert locusts, containing as many as five billion insects, can destroy up to 10,000 tons of grain in a day. Locust experts were afraid that if these voracious, migratory pests were not controlled early, they could wipe out the 1986 harvests, and Ethiopia and Sudan would return to the famine conditions that gripped the two countries in 1984-85. In 1958, a plague of desert locusts consumed 167,000 tons of grain in Ethiopia; 15,000 people died of starvation that year. This disaster led to the creation of the Desert Locust Control Organization of East Africa (DLCO-EA) in 1962. Headquartered in Addis Ababa, DLCO assists East African member countries to detect and combat desert locusts and other migratory pest outbreaks in the region. Although DLCO had lost some of its operational capabilities since the last significant outbreak in 1978, it was able to provide valuable technical expertise and field experience to the regional locust control campaign in 1986.

Sudan

Following the return of abundant rains in the summer of 1985, small swarms of desert locusts and African migratory locusts were spotted in the Red Sea coastal region of Sudan. Locusts generally have two breeding seasons in East Africa: the winter season, between November and April, and the summer season, lasting from July until October. Following the 1985 winter outbreak, the Sudanese Plant Protection Department (PPD) began ground and aerial spraying in the central and eastern regions. This operation totally depleted the Ministry of Agriculture's pesticide stocks. In preparation for the upcoming summer breeding season, the Government of Sudan (GOS) and FAO launched an

appeal for multidonor support for a national locust control campaign. Although Sudan has one of the largest plant protection departments in Africa, it was in desperate need of vehicles, equipment, and pesticides for the 1986 campaign. A locust expert sent by the EC prepared an action plan, outlining the identified needs and a timetable for the 1986 campaign, and submitted it to the international donor community in early June 1986.

International donor contributions to the campaign began to arrive in August. The Plant Protection Department was given the responsibility and resources to implement the locust control campaign. FAO dispatched an agro-aviation expert and project administrator to help coordinate the operation. The EC handled the procurement of all equipment, supplies, and pesticides for the multidonor program. A steering committee, comprising representatives of the GOS ministries, FAO, and other donors, was established to monitor and supervise the campaign. The Dutch Chargé d'Affaires served as chairman of the Committee, while the FAO representative served as secretariat. Representatives of USAID, the EC, and the U.N. Office of Emergency Operations in Sudan attended the weekly Steering Committee meetings.

The summer rains arrived late in northern Sudan, delaying major outbreaks of locusts and grasshoppers until late August. Scattered infestations were reported in the Red Sea, Kassala, Blue Nile, White Nile, Northern Kordofan, and Northern Darfur provinces. Survey teams in Darfur found the densities of grasshoppers to be much higher than those of desert locusts or African migratory locusts. PPD field teams began ground spraying and dispensing poisoned bait in the infested areas before the pests could move into the ripening sorghum fields. In September, DLCO and PPD rented airplanes to begin aerial spraying operations in Kassala, Sennar, Damazine, Gedaref, and North and South Darfur.

By October, harvesting of sorghum and millet crops had begun, and the locust situation appeared to be under control due in large part to the delay in hatching and the timely arrival of the donated pesticides, vehicles, and equipment. Nationwide, the sorghum and millet harvests in Sudan were good, although some farms did report crop losses from pest infestations. By all accounts, aggregate damage from desert and African migratory locusts and grasshoppers in major producing areas appeared to be negligible. However, in November, field monitors reported upsurges in desert locusts in the western, central, and northern regions of Sudan. Fortunately, most pesticides, equipment, and control teams were already in place, as the PPD braced for the approaching winter breeding season and possible locust invasions from Egypt and Ethiopia.

Assistance Provided by the United States Government

On June 25, U.S. Ambassador Hume Alexander Horan determined that the situation warranted USG assistance. The EC vanguard action plan was distributed to USAID/Khartoum and the ad hoc A.I.D. Locust Working Group in Washington. Subsequently, OFDA contributed a $1 million grant to the FAO/EC to support the locust control program in Sudan. The grant was used to procure 30,400 liters of fenitrothion, 3,000 liters of fendona, 10,000 liters of diazinon, dusters, sprayers, camping supplies, radio equipment, and vehicles, and to pay for the salaries of the two FAO consultants. To augment the Mission staff, USAID/Khartoum requested the services of a personal services contractor (PSC) to monitor the campaign and a trained entomologist to provide technical assistance to the Mission. Kate Farnsworth, a PSC funded under the FY 1985 Sudan Drought and recently evacuated from Sudan for security reasons, returned to Sudan to serve as the Mission's locust monitor. George Schaeffers, a Cornell University entomologist and consultant for the Consortium for International Crop Protection (CICP), was dispatched to conduct field surveys. USAID/Khartoum also used $600,000 from its GOS-AID counterpart funds to finance aerial spray operations throughout Sudan (value not included).

Summary of USG Assistance

Grant to FAO/EC	$1,000,000
TDY of CICP consultant	$24,948
TOTAL	**$1,024,948**

Assistance Provided by U.S. Voluntary Agencies and Other Private Groups

Union Carbide—donated 2,400 liters of Sevin-4-In oil, value not reported.

Assistance Provided by the International Community

International Organizations

EC — provided $1,500,000 to purchase 50,000 liters of fenitrothion, 10,000 liters of diazinon, dusters, sprayers, vehicles, and radio equipment. Also, the EC contributed 400 MT of diesel fuel, valued at $146,000, and provided the services of a secretary to the Steering Committee.

FAO — donated 25,000 liters of fenitrothion and sent one FAO agro-aviation expert and an administrative assistant to assist the PPD. Their salaries were paid out of the AID/OFDA grant.

OPEC — donated 14 vehicles, value not reported.

Governments

Finland — provided 56,000 liters of fenitrothion, valued at $400,000.

Greece — donated 80 MT of BHC, valued at $50,000.

Italy — pledged 50,000 liters of malathion, 10,000 liters of diazinon, 200 MT of propoxur dust, 20 MT of carbaryl, vehicles, sprayers, radios, and protective clothing, all valued at $1,000,000. A total of $2.5 million was pledged.

Japan — donated 15,000 liters of fenitrothion, valued at $102,000.

Netherlands — provided a $1,000,000 grant to FAO for purchase of 41,200 liters of diazinon, radio equipment, camping sets, vehicles, and operating and personnel costs.

Spain — donated 115 MT of BHC dust, valued at $62,000.

Sweden — provided a $560,560 grant to FAO for the purchase of 25,020 liters of fenitrothion ULV, 7 MT of propoxur, sprayers, and operating costs.

Yugoslavia — provided 100 motorized sprayers, valued at $56,000.

Non-Governmental Organizations

OXFAM/U.K. — paid for transportation costs, valued at $25,000.

TOTAL $4,901,560

Ethiopia

The first signs of a potentially serious pest infestation began to appear during the summer rainy season. Ethiopia had experienced a serious outbreak of armyworms in 1984, and small numbers of locusts had been sighted during the subsequent winter breeding season. With the return of the rains, farmers feared that swarms of locusts would devour their crops. In Ethiopia, farmers have responsibility for controlling non-migratory agricultural pests, while the Ministry of Agriculture (MOA) assumes responsibility for combating migratory pests, including locusts, armyworms, and quelea birds. In May, the MOA, in conjunction with DLCO, began surveying and mobilizing in preparation for a major locust outbreak. At the same time, FAO began issuing statements warning the international community that the worst locust plague in over 50 years could lead to another famine in Africa. In July, an ad hoc committee, comprising representatives of the MOA, DLCO, FAO, and other donors, began holding regular meetings in Addis Ababa. FAO served as the focal point for donor coordination and contributions and produced monthly situation reports. The MOA provided pesticides and application equipment to farmers and dispatched survey and control teams to the affected areas. DLCO furnished some vehicles and technical assistance to the MOA.

The most serious infestation occurred in the northern provinces of Wollo, Gonder, Tigray, and Eritrea. Two rebel secessionist movements operate in Eritrea and Tigray, making survey and spraying operations in those two provinces difficult. The Eritrean Relief Association (ERA), a relief organization affiliated with the Eritrean People's Liberation Front (EPLF), reported that there were uncontrollable levels of desert locust infestation throughout the province. The Relief Society of Tigray (REST), the relief arm of the Tigray People's Liberation Front (TPLF), made similar claims concerning the situation in Tigray. However, the Provisional Military Government of Socialist Ethiopia (PMGSE) reported much smaller concentrations of locusts and grasshoppers in isolated infested areas, based on sightings by helicopter and ground surveillance teams. Where independently verifiable assessments were possible, survey teams reported as many as 20,000 grasshoppers per ha in northwestern Gonder,

but much smaller concentrations of locusts (between 50 and 100 per ha) in portions of western and central Eritrea.

MOA/DLCO survey and control operations in the four affected provinces began in August. However, the MOA teams could not enter the rebel-controlled areas in Eritrea and Tigray. This added to uncertainty over the extent of the locust build-up. REST and ERA continued to disseminate alarming reports on the extent of the locust plague and levels of crop damage. (Some international donors contributed funds and supplies to the locust control campaign managed by ERA.) Despite the security problems, the MOA/DLCO teams were able to survey most of the identified infested areas. As of October, approximately 8,000 ha of infested land had been sprayed by ground control teams, and an additional 2,400 ha had been sprayed as a barrier to contain the pests. The MOA announced that the locust situation was under control and that the plague and famine that had been feared was averted. Although Eritrea and the western provinces did suffer crop damage, mostly from grasshoppers and armyworms, the rest of Ethiopia had good harvests.

Assistance Provided by the United States Government

On July 24, U.S. Chargé d'Affaires James Cheek determined that the threat of a locust plague warranted USG assistance. The U.S. Mission requested that OFDA provide a $75,000 grant to FAO to be used for the multilateral locust control effort. The grant was allocated to FAO and used to purchase 8,900 liters of fenitrothion 96 percent ULV, the pesticide of preference in Ethiopia. In August, the U.S. Mission requested the services of an entomologist to help sort out the conflicting accounts of the level of infestation in the north and make recommendations on any additional action that might be needed. George Schaeffers, Cornell University entomologist already on TDY in Sudan, went to Addis Ababa and prepared a report, with the help of John Gaudet, the USAID environmental officer stationed in Nairobi, Kenya.

TOTAL $75,000

Assistance Provided by U.S. Voluntary Agencies

American Friends Service Committee — provided $25,000 to ERA.

LWR — donated $50,000 to locust control operation in Eritrea.

TOTAL $75,000

Assistance Provided by the International Community

EC — provided 72,000 liters of pesticides and 2,000 ULV knapsack sprayers, value not reported.

Governments

Canada — provided 7,500 liters of pesticide, valued at $75,000.

China, People's Republic of — provided 20,000 liters of diazinon, value not reported.

Finland — donated fenitrothion, valued at $160,000.

Norway — donated $201,000 worth of assistance to ERA.

Switzerland — provided 7,000 liters of basudin and 40,000 liters of fenitrothion, value not reported.

United Kingdom — provided two Land Rovers and two station wagons, value not reported.

Non-Governmental Organizations

Christian Aid (U.K.) — provided $150,000 worth of assistance to the ERA.

Christian Relief and Development Association (CRDA) — donated two Bedford trucks and two four-wheel drive vehicles, value not reported.

Danchurch Aid — provided $1,176 worth of assistance to the ERA.

Norwegian Church Aid — donated 28,400 liters of fenitrothion, 1,000 hand operated knapsack sprayers, 200 motorized knapsack sprayers, and protective clothing to the ERA; value not reported.

Oxfam/U.K. — provided 7,000 liters of fenitrothion to the ERA.

TOTAL $587,176

Locust Infestation

Central and southern Africa are threatened by two species of locusts: the red locust *(Patanga septemfasciata)* and the brown locust *(Locustana pardalina)*. Historically, red locusts have emanated from several recognized outbreak areas, including the Kafufu and Wembere river valleys in Tanzania and the Kafue and Mweru Wantipa swamp regions in Zambia. They generally produce one generation per year, hatching after the end of the rainy season and surviving until the return of the rains in November. The most recent red locust plague lasted from 1930 until 1944 and infested most of central and southern Africa. Brown locusts, on the other hand, come from the Karoo and North West Cape areas of South Africa and can invade the countries of Botswana, Namibia, Mozambique and Zimbabwe. Outbreak periods for brown locusts usually last seven to 11 years, followed by recessional periods of approximately the same length.

A regional organization to combat red locusts, the International Red Locust Control Organization of Central and Southern Africa (IRLCO-CSA), was established in 1941 with headquarters at Mbala, Zambia. However, in recent years, IRLCO has not been able to maintain its aircraft and equipment and was not operational in this campaign.

The situations in Tanzania, Botswana, and Zambia are discussed in more detail in this section. South Africa also experienced an outbreak of brown locusts, but local authorities were able to control it. This greatly alleviated the situation in neighboring countries. In August, the Government of Zaire reported an infestation in the remote province of Haut-Zaire. At the request of the U.S. Mission, OFDA fielded an assessment team to investigate the report, but no infestation was found. The team's expenses amounted to $16,180 (of which $5,320 was from OFDA's travel budget).

Tanzania

Tanzania is one of the historic breeding grounds for red locusts in Africa. Small numbers of red locust nymphs emerged from the floodplains of Rukwa and Tabora Regions in early 1986. The Government of Tanzania (GOT) began survey and control operations in April. The Plant Protection Division (PPD) of the Ministry of Agriculture (MOA) took over the operation and leased private helicopters to conduct surveys along the Kafufu river in Ruwka and in the Wembere river valley in Tabora region. Also at PPD's disposal were four fixed-wing spray planes, two Piper Super Cubs, and two Cessna 185s. However, one of the Cessnas became damaged during a landing at Tabora and needed a new propeller and support brackets for the landing gear. USAID furnished the funds for the spare parts and repair of this airplane.

In August, FAO and the GOT established a locust Control Steering Committee to oversee PPD's operations. The Committee was chaired by FAO and comprised representatives from the MOA, the Prime Minister's Office, USAID, UNDP, UNICEF, Canada, the United Kingdom, Denmark, and West Germany. The Committee considered a Ministry of Agriculture proposal for a three-year program aimed at reducing the 1986 locust threat and prepositioning pesticides, vehicles, mobile radios, and aircraft for the anticipated 1987 locust outbreak.

Spray operations had to be completed before the onset of the rainy season in October. Fortunately, red locust swarms remained localized, making targeted spraying much easier. Over 12,000 ha in the Tabora and Rukwa regions were surveyed and sprayed. There were no reports of red locust swarms escaping into neighboring states. In September, the MOA estimated that 90% of the concentrated locust population had been eradicated, but predicted a much larger outbreak starting in April 1987.

Assistance Provided by the United States Government

The potential for a serious red locust plague in Tanzania prompted U.S. Chargé d'Affaires Joseph Segars to declare a state of disaster on August 13. After consultation with the Plant Protection Department, USAID/Dar Es Salaam requested OFDA to provide $50,000 to contract helicopter surveys and to pay for spare parts needed to repair the damaged Cessna 185 spray plane. The Mission allotment of $50,000 was used to pay for 65 hours of helicopter survey time and to purchase aircraft spare parts valued at $18,000.

TOTAL $50,000

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

China, People's Republic of — donated 20 MT of fenitrothion, value not reported.

Denmark — the Danish aid agency, DANIDA, contributed 30,000 liters of fenitrothion and $100,000 to cover operating expenses of the Ministry of Agriculture.

Worker wears protective face mask for pesticide application.

DLCO-EA — although specifically mandated to assist in the control of desert locusts in East Africa, DLCO-EA sent 10,000 liters of fenitrothion from its storage warehouse in Hergeisa, Somalia, to the PPD for red locust spray operations. However, 5,000 liters of this fenitrothion turned out to be ineffective, possibly because it was stored in high temperatures causing it to lose its potency.

FAO — provided 10,000 liters of pesticide and contributed to helicopter surveys, valued at $30,000.

UNICEF — loaned two of its trucks for transporting pesticides and fuel.

United Kingdom — the Overseas Development Administration (ODA) sent two Land Rovers, valued at $40,000, for ground operations.

TOTAL $170,000

Zambia

Two of the recognized outbreak areas for red locusts are located in Zambia, one in the Kafue Flats west of Lusaka, and the other in the marshy areas near Lake Mwera in the north. In August, small swarms of red locusts were spotted in both areas, threatening nearby sugar and tea plantations. The IRLCO-CSA prepared a list of materials and support it would require to mount a locust control campaign. On August 15, the Government of the Republic of Zambia (GRZ) and the local FAO representatives called a donors' meeting and appealed for foreign assistance to combat the likely red locust threat.

In the 40 years since the last serious red locust outbreak, IRLCO had lost most of its operational capabilities and resources. It had no working vehicles with which to conduct survey operations. All four of its fixed-wing aircraft needed repairs, and only one was equipped with spraying apparatus. As a result, GRZ Air Force helicopters were used to survey the Kafue Flats and Lake Mwera regions. Over 1,000 ha in the Blue Lagoon National Park within the Kafue Flats were treated. Donated pesticides and other commodities were prepositioned closer to the potential outbreak areas in anticipation of more serious outbreaks following the 1987 rainy season.

Assistance Provided by the United States Government

Following the request for assistance from the GRZ and IRLCO, U.S. Chargé d'Affaires Kenneth Hill determined on August 17 that the situation required USG assistance. The U.S. Mission contributed $100,000 for fuel and operating costs of GRZ helicopters used to conduct aerial surveillance. A mission allotment of $100,000 was presented as a grant to the GRZ Ministry of Agriculture and Water Development for helicopter surveillance and contingency aerial spray operations.

TOTAL $100,000

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

FAO — contributed 15,000 liters of fenitrothion, valued at $120,000, and paid $4,000 for general operating expenses for an FAO red locust control project in Zambia.

Denmark — gave 10,000 liters of fenitrothion, valued at $80,000.

Japan — donated 10,000 liters of fenitrothion, valued at $80,000.

United Kingdom — provided sprayers and fuel for IRLCO spray planes; valued at $62,000.

TOTAL $346,000

Botswana

After suffering from five consecutive years of drought, Botswana was faced with the threat of an invasion of brown locusts coming from South Africa. Swarms of brown locusts began developing in northern Cape Province of South Africa in early 1986. Fortunately, a combination of effective control programs, favorable weather conditions, and lack of foliage due to the drought prevented the swarms from causing much crop damage in Botswana. However, this first generation of brown locusts laid millions of eggs, which would begin to hatch following the return of the rains and warmer temperatures. In August, sightings of young locust hopper bands were reported in the Southern and Central districts of Botswana. On August 29, a small swarm descended upon the capital city of Gaborone, raising public awareness of the threat.

The Government of Botswana (GOB) and the FAO began preparing for a large scale invasion of brown locusts from South Africa. FAO sent two migratory pest experts to assist the GOB's Ministry of Agriculture in coordinating a locust control campaign. DLCO-EA, IRLCO-CSA, and the Southern African Regional Council for Conservation and Utilization of the Soil (SARCCUS) also sent experts to assist in training MOA agricultural agents in locust control methods. In August, the UNDP Resident Representative chaired several donor meetings to identify requirements for the late 1986 campaign and to cooordinate donor contributions. The United States, EC, Finland, Norway, and the United Kingdom provided grants to FAO in Rome to purchase the needed pesticides, equipment, and vehicles to be delivered to Botswana. Donor contributions began arriving in October, before any serious infestation occurred inside Botswana.

Despite unfriendly relations between the governments of Botswana and South Africa, agriculture officials from these two countries met at a SARCCUS technical meeting to coordinate their respective control campaigns. The South African Government (SAG) deployed over 200 ground spraying teams to 42 magisterial districts in the Cape and Orange Free State provinces. The GOB Defense Force conducted aerial surveys to locate bands and swarms of brown locusts inside its borders. The MOA dispatched its control teams, equipped with backpack and vehicle sprayers and radios, to spray groupings of locusts as soon as they were located. These control teams reported a 90 percent kill rate of locusts by ground spraying. In addition, many locusts died due to starvation or excessive heat or were killed by natural predators such as birds and rodents. By December, the situation in Botswana was under control, and all donor contributions had been prepositioned for the 1987 season.

Assistance Provided by the United States Government

On August 15, U.S. Ambassador Bellocchi determined that the impending locust infestation

in Botswana warranted USG assistance. The Ambassador used his $25,000 disaster assistance authority to purchase 12 single-sideband radios to provide to the GOB Ministry of Agriculture. OFDA also provided $100,000 bilaterally to the GOB to establish an emergency command center within the Ministry of Agriculture. In addition, OFDA provided two grants totaling $1,058,587 directly to FAO/Rome to purchase needed pesticides, sprayers, and aerial survey time for the Government of Botswana. The grants were used to purchase 32,000 liters of fenitrothion 96 percent ULV ($421,646), 20 backpack motorized ULV sprayers and 13 vehicle-mounted ULV sprayers ($28,342), radios ($35,743), helicopter and aircraft flying time ($164,583), quality control of pesticides ($2,500), and technical personnel support ($31,066). The remainder of $347,707 was set aside for future aerial surveillance and toward the 1987 brown locust control campaign in southern Africa.

TOTAL $1,183,587

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

EC — provided 52,000 liters of fenitrothion and storage sheds ($5,000) and paid for 120 hours of flying time for fixed-wing airplane and helicopter surveying and spraying.

FAO — contributed 2,800 liters of fenitrothion, 15 backpack sprayers, and paid for 45 hours of aerial surveying and spraying. FAO also dispatched two migratory pest experts to administer FAO activities and coordinate the locust control effort with the Ministry of Agriculture.

Finland — contributed 28,000 liters of fenitrothion and $20,000 for operational expenses.

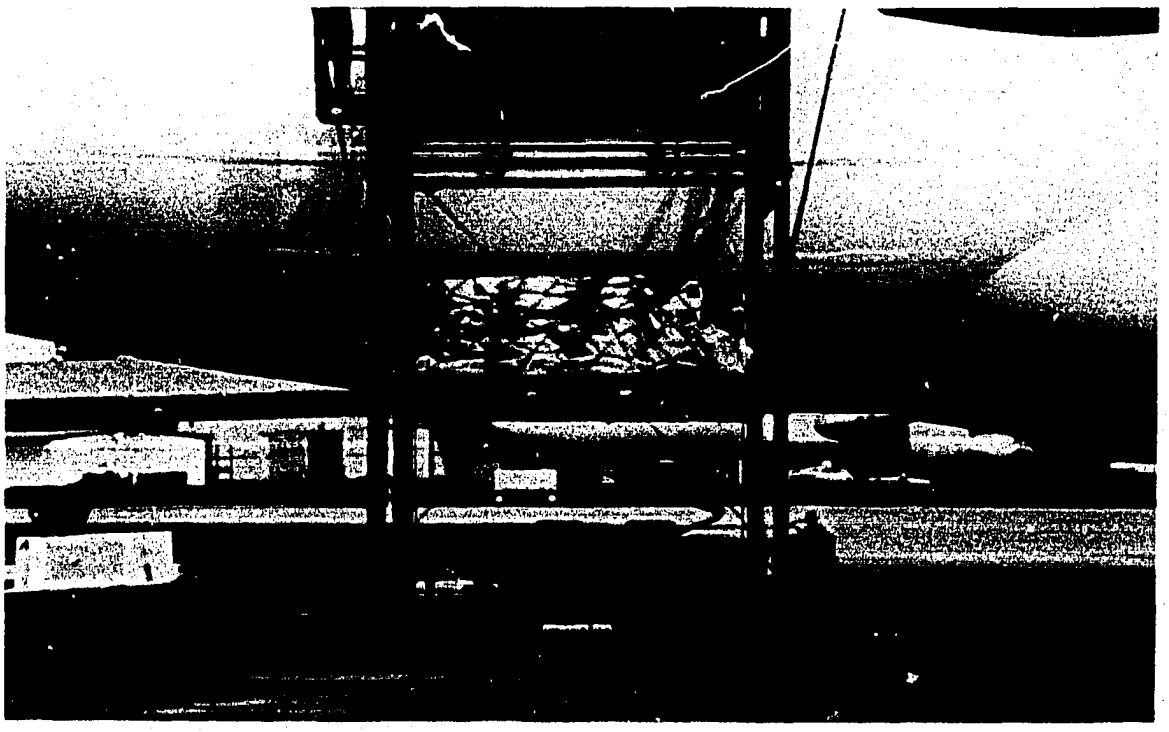
Norway — provided 16,000 liters of fenitrothion, 40 pick-up trucks, three landcruisers, five 5-ton lorries, and $830,000 for operational expenses.

UNDP — Resident Representative served as donor coordinator and supervised FAO experts. UNDP also donated 6,500 liters of fenitrothion and $377,000 for various operational expenses.

United Kingdom — donated 20 pick-up trucks valued at $375,150.

TOTAL $1,607,150

Unloading containers of pesticides



Drought

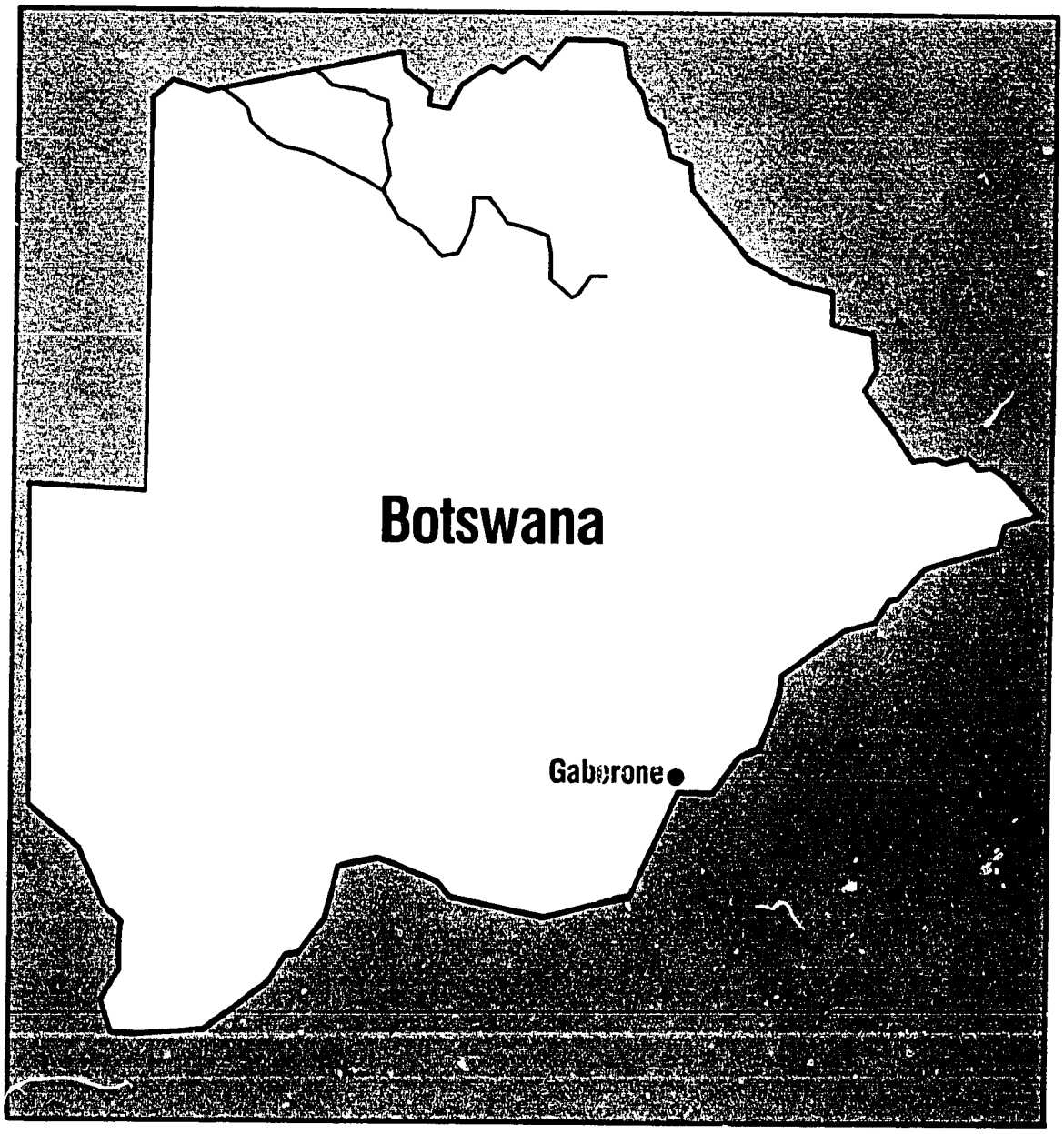
Botswana

Date:
1982-1986

Location:
Countrywide, except for Chobe District

No. Dead:
Not reported

No. Affected:
648,000



The Disaster

In April 1986, the President of Botswana announced that the country was experiencing the worst drought in over 60 years. For five successive years, the rains had been below average throughout most of the country. By the end of the 1985-86 rainy season in March, recorded rainfall amounted to only 57 percent of the long-term average. Only Chobe District in the far north reported above normal rainfall, while several districts which had been declared recovery zones in 1985 were redesignated as drought stricken areas in 1986. Total food production amounted to only 16,000 MT. As a result, Botswana was forced to import over 90 percent of its cereal needs.

The cumulative effects of five straight years of drought were particularly felt by the rural population, who had lost much of their crops and livestock and, therefore, their basic source of income. With improved rainfall in some areas in 1985, 24 percent of the population was designated as living in recovery zones. This dropped to one percent, however, in 1986. Nevertheless, the percentage of malnourished children in the country fell from 24 percent to 16 percent due to the improved effectiveness of supplementary feeding programs. The total affected population consisted of 240,000 children, 390,000 people from other vulnerable groups, and 18,000 remote area dwellers.

Action Taken by the Government of Botswana (GOB)

On April 11, 1986, President Masire declared the fifth consecutive year of drought and appealed to the international community for continued assistance. Since 1982, the GOB's Inter-Ministerial Drought Committee has developed and implemented the national drought relief program. Vice President Mmusi presented the 1986-87 program at an international donors meeting held in Gaborone in May. The drought relief program included the following components: supplementary feeding projects for malnourished children; a cash-for-work program for relief workers; subsidies and provisions for livestock owners; a water rehabilitation project; and a grain reserve program.

Assistance Provided by the U.S. Government (USG)

On April 30, U.S. Ambassador Natale Bellocchi declared a drought disaster in Botswana for the fifth year in a row. Ambassador Bellocchi contributed $25,000 to the Handstamping Project, part of the GOB's cash-for-work program. The Handstamping Project paid rural women to pound sorghum into flour for a school-feeding program.

As part of its emergency P.L. 480 Title II program, A.I.D.'s Office of Food for Peace allocated 4,360 MT of CSM to the GOB. Commodity cost was valued at $1,272,700, and ocean freight and inland transport costs totaled $761,900.

Total OFDA $25,000

Total FFP $2,034,600

TOTAL $2,059,600

Assistance Provided by U.S. Private Voluntary Agencies

None reported

Assistance Provided by the International Community

International Organizations

EC — provided 4,000 MT of maize and 200 MT of DSM; value not reported.

LWF — donated $500,000 for seed purchases.

UN/OEOA — gave $124,000 for seed purchases.

WFP — under WFP/Botswana Project 324/3, provided 7,000 MT of sorghum, 1,470 MT of vegoil, 4,810 MT of CSM, 1,223 MT of DSM, and 1,250 MT of beans; value not reported.

Governments

Australia — donated $125,000 for upgrading food storage facilities.

Canada — gave 2,160 MT of beans; value not reported.

Finland — provided $124,000 for the local purchase of 440 MT of seed.

Germany, Fed. Rep. of — donated 3,000 MT of maize purchased from Zimbabwe; value not reported.

New Zealand — gave 1,600 MT of maize; value not reported.

United Kingdom — provided $375,000 for seed purchases.

TOTAL $1,248,000

Cameroon

Lethal Gas Eruption

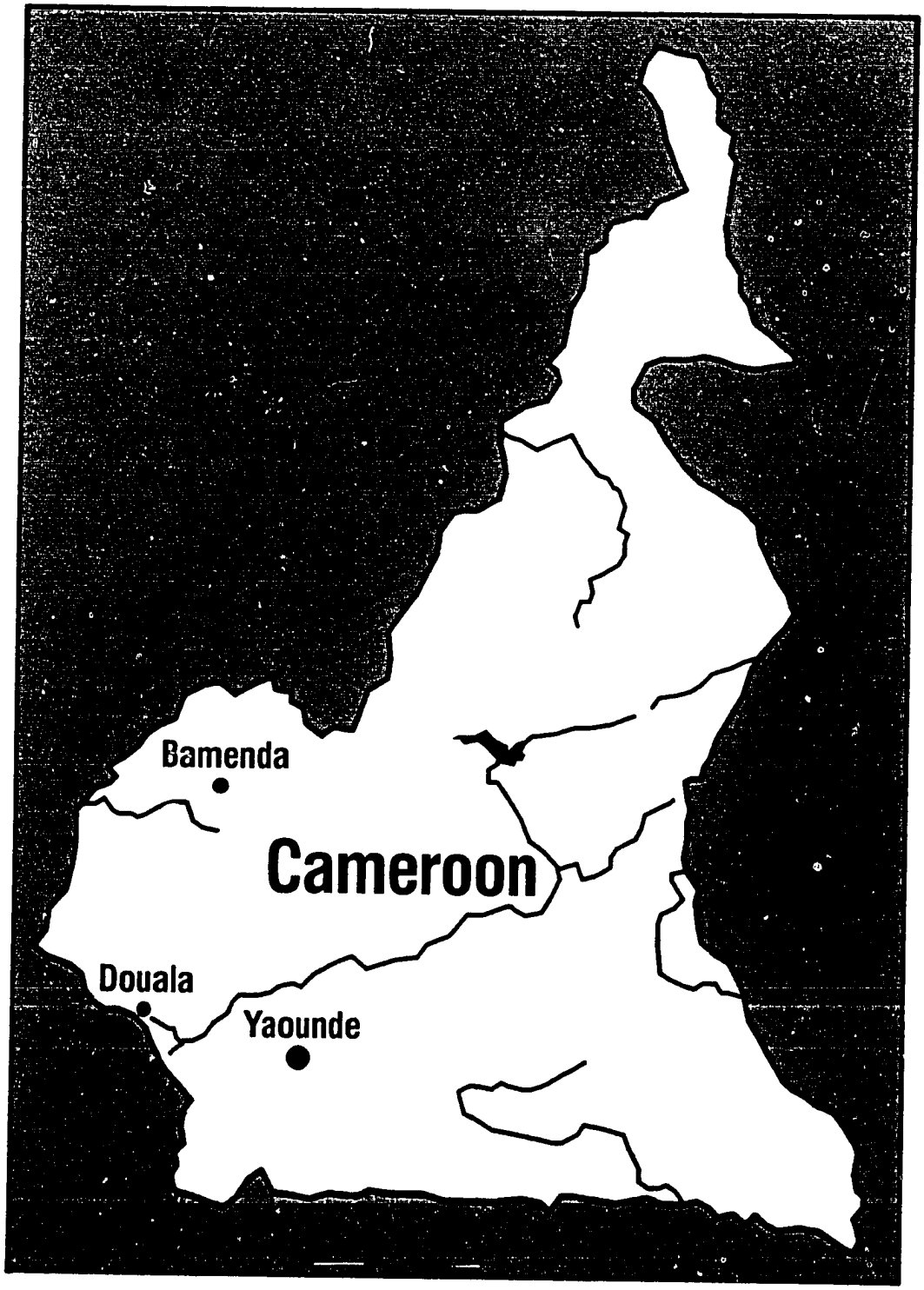
Date:
August 21, 1986

Location:
The Lake Nyos area in the northwest province of Menchum, especially the villages of Nyos, Cha, Fang, and Subum

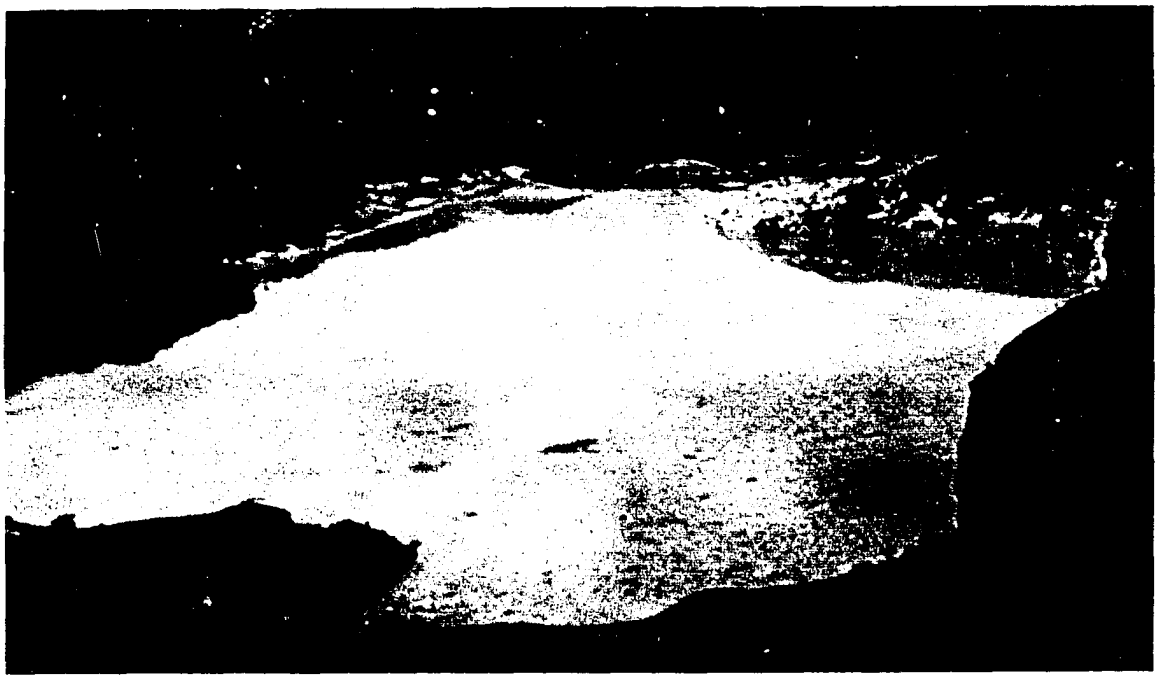
No. Dead:
1,734 (official GRC casualty figures); 500 injured

No. Affected:
4,634 registered as displaced persons; possibly as many as 10,000 in need of resettlement

Damage:
Animal herds destroyed (3,000 head of cattle) and hundreds of homes left unsafe for habitation



Lake Nyos after catastrophic gas release



The Disaster

The mysterious release of a deadly gas cloud from remote Lake Nyos in northwestern Cameroon brought sudden death to over 1,700 people on the evening of August 21 and forced the evacuation of thousands of others from their villages. At least 500 survivors required medical treatment for skin lesions, burns, bone fractures and dislocations, and gastrointestinal complaints. Thousands of animals perished on the hillsides and valleys where they grazed.

Disaster struck virtually without warning. Heavy rains and thunderstorms in the early evening, typical of the rainy season then in progress, gave way to calm weather and cool temperatures. Sudden low rumbling sounds from the lake at about 9:30 p.m. brought many people from their huts into the open where they quickly lost consciousness. Others were struck down inside their homes as they went about their usual evening activities. Only one survivor, who was on high ground above Lake Nyos, actually recalled seeing the cloud rise from the lake just as a large surge of water washed up on the southern shore.

The cloud moved outward along river valleys, killing nearly all the inhabitants of the village of Nyos and taking a heavy toll in the villages of Cha, Subum, and Fang. The pattern of death was not uniform, however, suggesting uneven concentrations of the gas. Survivors, both animal and human, were found in the same enclosed areas where others had died. Many of the survivors remained unconscious for up to 36 hours.

Lake Nyos is one of several crater lakes in a chain of volcanic mountains in the northwestern part of the country. Prior to the August 21 event, the lake was clear, and water flowed over a narrow spillway at the northern end to a depth of 60 to 70 cm during the rainy season (May to September). With the toxic gas release, a large water surge washed up the southern shore to a height of 25 m. A six meter surge overflowed the spillway, and a fountain of water or froth splashed over an 80 m promontory at the southwest side of the lake. The lake turned brownish-red, and mats of vegetation floated on the surface. The water level subsequently dropped below the spillway until August 24 when normal outflow returned.

The event would undoubtedly have provoked wide interest among the international scientific community even as an isolated phenomenon because of its unusual nature and tragic consequences. But this was not the first time such an event had occurred in Cameroon. Almost

exactly two years earlier (August 15, 1984), a lethal cloud issued from Lake Monoun, some 95 km southeast of Lake Nyos in the same mountain chain, claiming 37 lives.

U.S. scientists investigating the earlier disaster concluded that high concentrations of carbon dioxide in the cloud had been responsible for the fatalities. A similar conclusion was reached by the U.S. medical and scientific teams sent to Lake Nyos. At lethal levels, carbon dioxide kills by depriving its victims of oxygen and depressing the regulatory centers of the brain. There was no evidence of a volcanic eruption or a seismic shock as a triggering event for the release of the lethal cloud at Lake Nyos. The gas, however, was believed to have been derived from deep-seated magmatic sources.

(See also USG Assistance.)

Action Taken by the Government of the Republic of Cameroon (GRC) and Non-Governmental Organizations

Because of the remoteness of the area, news of the disaster did not reach the outside world until Saturday, August 23, when two helicopter pilots from Helimission (a Swiss missionary service) flew into the area and quickly reported their findings. An aide of the provincial governor described a "frightful sight" when he reached the stricken area on August 24, the same day that Cameroon's President Biya flew to Bamenda to oversee rescue operations. President Biya declared the region a disaster area and directed the establishment of a GRC crisis center in Bamenda.

Military units dispatched to the disaster site sealed off the affected area and completed the grim task of burying the dead in mass graves. The injured were evacuated to regional hospitals in Wum and Nkambe. Other survivors took refuge in neighboring villages where they were cared for by traditional hospitality. The GRC planned to build two tent cities to accommodate the displaced persons. Some 16 tons of canned rations were flown to Bamenda during the first few days of the relief operation, but, because the few roads to the area had been made largely impassable by seasonal rains, supplies were slow to get through to the disaster victims.

The Cameroon government appealed for international assistance on August 26, identifying the following principal needs: technical assistance to determine the cause of the disaster, tents, blankets, medical supplies, field rations, and suits with self-contained breathing apparatus. An interministerial committee was appointed to coordinate international aid. Regional coordinating committees were also established in Douala and Bamenda.

Local NGOs responded with prompt assistance. The Cameroon Red Cross (CRC) sent an assessment team from national headquarters on August 24, which was joined by members of the Red Cross Committee of Bamenda. Sixty Red Cross workers from other provinces augmented the relief team. The CRC cooperated with the government to ensure the transhipment of supplies from Yaounde and Douala to Bamenda. The Federation of Evangelical Churches and Missions in Cameroon (FEMEC) worked with a representative of the World Council of Churches and Lutheran World Relief to determine immediate and long-term needs.

Of particular concern to government authorities was the fate of the many children who had survived the disaster but whose parents had died. The GRC asked the U.S. voluntary agency, Save the Children, to conduct a survey of homeless and orphaned children to identify them for short-term assistance and eventual resettlement with relatives or others.

Cameroonian authorities cooperated with U.S. and other donor scientific teams in arranging logistical support to carry out field studies. The Council of Ministers announced several decisions on the Lake Nyos disaster after a September 18 meeting: (1) immediate steps would be taken to get relief supplies to the affected area, possibly by leasing or borrowing helicopters; (2) an international scientific conference would be held at "an early date" to discuss the cause(s) of the disaster and the means of establishing an alert system; and (3) a "reflection" committee would be set up under the chairmanship of the Minister of Plan to identify and resolve continuing problems associated with the disaster.

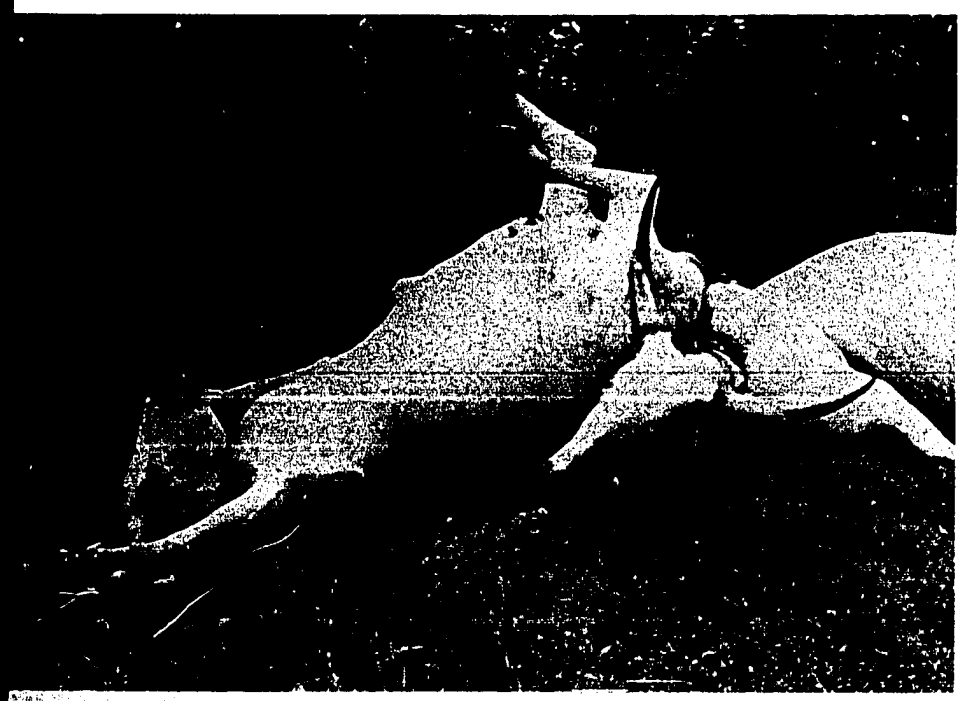
Assistance Provided by the United States Government

In response to the GRC's request for USG assistance, U.S. Ambassador Miles Frechette issued a disaster declaration on August 25. His $25,000 disaster assistance authority was used for the

local purchase of rice and canned food for survivors and relief workers.

Because of the extraordinary nature of the disaster, technical assistance was deemed essential, and Ambassador Frechette requested that U.S. medical and scientific experts be quickly dispatched to Cameroon. Within hours, OFDA had made arrangements to send a multidisciplinary team to the disaster site, accompanied by OFDA's Health Preparednness Coordinator. Two forensic pathologists and a forensic photographer from the Armed Forces Institute of Pathology made up the medical component of the team. The forensic team remained in Cameroon from August 27 to September 2, interviewing survivors and conducting post-mortem examinations in an effort to identify the agent, or agents, responsible for the deaths and injuries.

A scientific team comprising a geologist and two geochemists from the USGS, and a geologist from Brown University arrived in Cameroon on August 28 to investigate the cause of the gas emission and the type and origin of the gases involved. The team was joined by two members of the EPA's Environmental Response Team and a limnologist (specialist in fresh water geologic chemistry) from Duke University on September 1.



Cattle asphyxiated by lethal gas cloud

After completing a preliminary evaluation of Lake Nyos and collecting gas and water samples for further laboratory analysis in the United States, the U.S. scientific team, at the GRC's request, conducted a limnological survey of several other crater lakes in the region. Because of time and weather constraints, only a cursory inspection of seven lakes was possible; however, baseline data on 17 of the approximately 40 crater lakes in Cameroon had already been obtained in a USG-funded study after the Lake Monoun disaster. The team recommended a more thorough investigation of the remaining lakes at the earliest dry-season opportunity. The findings of the team are summarized in a separate section below.

OFDA also procured protective clothing and other safety gear for the use of a Cameroonian investigating team and the U.S. technical experts. The supplies, purchased from Safety Technology and Oilfield Protectors, Inc. (S.T.O.P.), consisted of 15 acid suits, 17 SCBA (self-contained breathing apparatus), three hydrogen sulfide detectors, compressors, gas bottles and racks, annd other components. Two trainers accompanied the shipment. On September 19, the U.S. Embassy presented the safety equipment to representatives of the Cameroon government.

As needs of the surviving victims were better identifed, OFDA arranged a DOD airlift of 250 tents and repair kits, the equivalent of 15 tons of supplies, from the A.I.D. stockpile in Leghorn, Italy. These items arrived in Bamenda, Cameroon, on August 29. OFDA also provided funds for the local purchase of food and internal transport costs. Part of the additional allocation was used to support the SCF survey of displaced Cameroonian children. Longer-term assistance of the orphaned children was expected to come from Mission funds previously earmarked for SCF's child survival program.

Summary of USG Assistance

FY 86

Ambassador's Authority $25,000

DOD C-130 airlift of tents from Leghorn $63,000

Local procurement of food and helicopter support $28,144

Purchase of safety equipment and expenses of trainers $88,360

U.S. scientific team gathers specimens for laboratory analysis.

Travel and administrative costs of medical team $15,623

Travel and administrative costs of EPA team $9,314

Travel and administrative costs of university scientists $13,457

Travel and administrative costs of USGS team $19,000

Film processing $800

250 tents and repair kits (value not included in total) ..... ($105,000)

Total FY 1986 ..... $262,698

FY 87

Additional scientific support costs $6,960

DOD preparation of topographic base maps $30,000

Total FY 1987 ..... $36,960

TOTAL $299,658

Findings and Recommendations of the U.S. Scientific Team

The findings and recommendations of the U.S. team, based on field and laboratory tests, are briefly summarized below. Final reports will be presented at an international conference on the Lake Nyos disaster, to be held in Cameroon in March 1987.

All scientific evidence points to carbon dioxide as the causative agent released from the lake, with no involvement of hydrogen cyanide, carbon monoxide, or hydrogen sulfide in the deaths or injuries. The skin lesions observed on many of the survivors were believed to be pressure sores from long periods of unconsciousness and immobility; burns from exposure to heat sources while the victims were comatose; or pre-existing skin conditions. The fractures, dislocations, and temporary paralysis suffered by some of the survivors were caused by falls or prolonged lying in a fixed position. Even the pungent, "rotten eggs" odor described by some survivors can be explained by the high concentrations of carbon dioxide which produces a phenomenon known as "olfactory hallucination."

The scientists concluded that the catastrophic degassing was not the result of direct volcanic activity. There was no evidence of severe disruption of lake bottom sediments, suspended sediment, or an increase in lake water temperature that would indicate a sudden injection of volcanic gas. The non-volcanic character of the gas was also apparent in the low concentrations of sulfur and chlorine compounds in the lake water.

The data from chemical, isotope, and geologic testing point to a magmatic rather than a biogenic source, however, for the bulk of the CO_2 released in this event. Magmatic gas is released from magma deep within the earth and, in contrast to volcanic gas, has a relatively low surface temperature; biogenic gas is produced by

the decomposition of organic matter. The gas had apparently entered the lake gradually, dissolved in ground water, reaching saturated levels in the bottom waters after a long period of time.

Previous stratification of the lake (i.e., a layer of less dense water overlying a layer of more dense water) would explain why the CO_2 had accumulated rather than escaping to the surface and safely dissipating into the atmosphere. Stratification would have prevented the mixing of bottom and surface waters until some mechanism such as an internal wave, a seismic shock, or a landslide triggered the formation of CO_2 bubbles which combined to form a large eruptive reaction. The burst of gas leaving Lake Nyos resulted in the formation of surface waves and a lethal cloud which initially rose 100 m above the crater rim. The reddish precipitate formed by the combination of deep-water dissolved iron with surface oxygen was further evidence that the lake was stratified and a mixing of surface and bottom waters had occurred.

The mechanism which initiated the release of the CO_2 could not be positively identified. No significant seismic activity was observed during or preceding this event, nor was there clear evidence that a landslide had occurred. An internal wave movement such as commonly occurs at the boundary between two layers of water at different densities remains a possible explanation. Such wave movements are often generated and intensified by wind stress or traveling pressure fields.

Because the lake is still 30% saturated with CO_2, the U.S. team recommends that monitoring of the lake be continued and that a method for "controlled degassing" be developed. The team also recommends that action be taken to intentionally modify the narrow spillway which drains the lake, since a failure of the weakly consolidated pyroclastic deposits of which it is formed could cause catastrophic flooding and another tragic gas release. Further field studies are also recommended to identify other lakes in the area with the potential for a catastrophic release of CO_2.

Water splashed to a height of 80 meters on the southwest shore of Lake Nyos.

Assistance Provided by U.S. Voluntary Agencies

Baptist World Alliance — provided an initial $5,000 to the Cameroon Baptist Convention to care for displaced persons and launched an appeal to the U.S. national bodies.

CARE — arranged transportation of U.S.-funded, locally procured food to the affected area.

CRS — gave $25,000 in cash for humanitarian use as deemed necessary by the country director.

CWS — forwarded $5,000 from the Executive Director's Emergency Fund and issued an appeal for $25,000 to put toward the WCC appeal.

SCF — donated $5,000 in cash to be used at the discretion of in-country staff; supervised a survey of surviving children up to age 15 to provide short-term support and a plan for long-term assistance.

WVRO — funded a $25,000 project for relief and rehabilitation assistance in coordination with the Cameroon Council of Churches.

TOTAL $65,000

Assistance Provided by the International Community

International Organizations

EC — with Spain, arranged an airlift of relief supplies. EC provided 50 tents, aircraft fuel, internal transport and logistics supervision, the total value of which was not expected to exceed 75,000 ECU (approximately $75,000). Another $75,000 was made available for a second operation, if required.

LRCS — sent a health adviser and liaison officer and launched an appeal for $263,019 to procure relief supplies and meet CRC operational costs.

UNDRO — on behalf of the GRC, issued an appeal for tents, blankets, camp beds, and food. In collaboration with the Italian government, UNDRO airlifted 18 tons of tents, blankets, and food. UNDRO also agreed to help the GRC establish an early warning system for the area.

WCC — in cooperation with the LWF, sent a field representative to assess needs; issued an appeal for $75,000 to purchase X-ray equipment and cattle to replace lost herds, and to establish an education fund for orphaned children; contributed $10,000 in cash for immediate needs.

WFP — authorized the GRC to use its in-country stocks if food aid was required.

WHO — provided three complete WHO emergency health kits, valued at $24,000, and a cash contribution of $40,000.

Governments

Canada — contributed $36,232 through LRCS and an additional $18,115 through UNDRO.

France — provided a team of two chemists, one physician, and three volcanologists and equipment, as well as medical supplies. France, with EC, also airlifted safety equipment (165 breathing apparatus, two compressors, and 5,000 masks), accompanied by 12 firemen; and provided one tank truck from French stockpiles in a neighboring country. On a combined French/Swiss relief flight, France sent two generators with technical staff.

Gabon — contributed $287,356.

Germany, Fed. Rep. of — arranged a relief flight consisting of 1,000 blankets, 1.5 MT of medicines and first-aid material, and 0.6 MT of protein biscuits, all valued at $35,545, and paid transport costs of a German Red Cross relief flight estimated at $37,914.

Israel -- sent a team of seven doctors and other medical personnel and equipment on a flight with Prime Minister Perez who arrived in Cameroon on August 25 for a state visit.

Italy — provided a scientific team headed by a volcanologist.

Japan — sent a team of nine experts to assist UNDRO in establishing an early warning system. The team included a member of the Technical Cooperation Division of the Ministry of Foreign Affairs, two volcanologists, a specialist in the use of protective gear and gas masks, a specialist in early warning, and two members of JICA (Japan International Cooperation Agency). A team of Japanese scientists planned to collect deep water samples from Lake Nyos with special pressurized containers during an October expedition. Japan also contributed $287,769 to the relief effort.

Netherlands — provided $100,000 for rehabilitation activities, and five generators, value not reported.

Spain — contributed 1 MT of medicine to the EC flight, value not reported.

Switzerland — provided a team of experts consisting of a coordinator, a physician, a gas analyst, a geologist, a construction specialist, a radio operator, and a mining engineer. The Swiss government also airlifted 120 tents, 700 kitchen utensil sets, 400 canvas covers, 2.5 MT of clothing, 1,500 blankets, 100 pairs each of rubber boots and gloves; all valued at $94,082. In addition, Switzerland donated $29,585 through UNDRO.

United Kingdom — sent a physician, a geologist, and a hydrochemist; also airlifted 200 tents, 2,000 blankets, 5,000 camp beds, antibiotics, dried/canned food items, and clothing, value not reported. The U.K. also provided locally procured milk and canned food, valued at $15,000, and transport from Douala to Bamenda.

Zaire — gave $100,000.

Non-Governmental Organizations

Australia Red Cross — donated $5,260 through LRCS.

Canada Red Cross — donated $3,183.

Young survivor of Lake Nyos disaster

Caritas Belgium — gave $23,255.

Caritas Germany, Fed. Rep. — provided $23,697.

Caritas Italy — donated $35,000.

Denmark Red Cross — contributed $22,409.

Finland Red Cross and Government — donated $35,402 and medicines, value not reported.

France Red Cross — contributed 60 first aid kits, valued at $6,840.

Germany, Fed. Rep., Red Cross — provided 400 tents, 6,000 blankets, and 2,000 foldable beds, all valued at $87,677.

Japan Red Cross — provided $36,297 and assisted the CRC in the purchase of two vehicles.

MSF — sent two physicians to help care for the injured.

Norway Red Cross — gave $5,971.

Secours Populaire Francais — provided a medical team.

Soviet Union Red Cross — gave 600 blankets and 200 sanitary kits, value not reported.

Spain Red Cross — donated 25 family tents, five hospital tents, and 2,000 blankets to the EC/Spanish relief flight; value not reported. A Spanish Red Cross team accompanied the flight.

Sweden Red Cross — donated $32,877 through LRCS.

Switzerland Red Cross — sent 120 tents, clothing, kitchen utensils, and camp beds, all valued at $80,532.

United Kingdom Red Cross — gave $19,805.

TOTAL $1,683,803

Cyclone

Date:
March 14-15, 1986

Location:
Central east coast, especially the port city of Toamasina (Tamatave)

No. Dead:
99

No. Affected:
83,885 homeless (GDRM estimates)

Damage:
Severe damage to the Toamasina port jetty, platform, and warehouses and to homes, public buildings (schools, health centers), and industrial installations; roads and railroad lines cut; communications disrupted; crops and food stocks lost.

The Disaster

Cyclone Honorinina was first detected as a tropical disturbance on March 9, some 600 km south of the Indian Ocean island of Diego Garcia. Moving in a westerly direction, the storm rapidly intensified, attaining a maximum wind speed of 280 km per hour on March 14 when it made violent landfall on the Malagasy east coast after devastating the island of Sainte Marie. The storm battered the coastal area for 30 hours, dumping 455.5 mm of rain on the country's main seaport city of Toamasina during a 24-hour period.

Damage was extensive along 800 km of the coast and up to 100 km inland as the storm followed a west-southwesterly course across the country. Toamasina, with a population of 120,000, was seriously affected, as were many smaller communities in the cyclone's destructive path. Fenerive-Est, Vavatenina, Ambatondrazaka, Brickaville, and Moramanga, all in the province of Toamasina, and Mananjary and Midongy du Sud in Fianarantsoa Province, were among the towns hardest hit.

The cyclone's strong winds flattened many traditional homes and poorly constructed buildings and ripped the roofs off thousands of others. Flying debris and falling trees caused further damage to walls and windows, and to telephone and electricity wires. The torrential rains penetrated roofless buildings, damaging personal goods, inventories, and machinery. Numerous public and commercial establishments were forced to close for repairs or reconstruction in the storm's wake, including schools, churches, office buildings, health centers, hotels, and factories.

Roads were cut in several areas because of washouts, earthslides, or damaged bridges. Both road and rail connections between Toamasina and the capital city of Antananarivo were temporarily severed. The airport in Toamasina was closed to all but light aircraft because navigational aids were damaged.

In addition to the damage from wind and rain, large sea waves whipped up by the storm wreaked havoc in the Toamasina port area. A 50-meter section of the port jetty was torn off and engulfed by the tide, leaving the port vulnerable to future storm damage. Full containers were picked up and tossed into the sea or smashed against the metal doors of warehouses. Four 3-ton cranes broke away and rolled to the water's edge, and a coastal road was rendered impassable by the overflowing sea.

Damage to the port warehouses resulted in the loss of some 4,000 tons of rice and 990 tons of stored cloves and cotton. Rice fields and palm plantations were affected in some regions, adding to the economic losses. The World Bank estimated that it would cost over $27 million to repair the highest priority commercial areas.

Action Taken by the Government of the Democratic Republic of Madagascar (GDRM) and Non-Governmental Organizations

The GDRM Minister of the Interior, chairman of the national relief organization, le Conseil National de Secours (CNS), met with the diplomatic corps and NGOs on March 20 to give a preliminary briefing and to appeal for disaster assistance.

The CNS followed its initial inspection of the stricken area with a careful survey to determine the extent of damages and rehabilitation/reconstruction needs. A detailed report of damages and specific requirements by administrative subdivision was published in April.

Between March 17 and April 9, the CNS delivered approximately 19 tons of relief supplies to Toamasina, Brickaville, Anosibe an Ala, Vavatenina, Sainte Marie, Fenerive-Est, and Ambatondrazaka. These items included milk powder, rice, soap, blankets, candles, matches, and articles of clothing.

Government grants to the affected regions and victims amounted to $113,287 ($59,687 to the regional committees and $53,600 to the victims and their families).

Caritas Madagascar and the Malagasy Red Cross (MRC) conducted independent shelter surveys. Caritas distributed food and clothing provided by Catholic Relief Services. The local Red Cross Youth worked with the LRCS delegate to set up food distribution centers. Milk, rice, clothing, blankets, and medicines were distributed in Toamasina and the most seriously

affected villages. The MRC provided 30 sacks of rice and 750 kg of soap from its own stocks.

Other reported donations to the relief effort included the following:

- Societe Record Antananarivo — gave 10 cartons of liquid soap and 50 cartons of candles, value not reported.
- Fifanampiana Malagasy — provided 120 sacks of milk powder, value not reported.
- SOTEMA Mahajanga — donated 678 kg of fabric, value not reported.
- SOTEMA Antananarivo — contributed 378 kg of fabric, valued at $3,556.
- Private groups and individuals gave a total of $15,700 in cash. (as of April 16)

Assistance Provided by the United States Government

Having determined that the damage from Cyclone Honorinina was of a magnitude to constitute a major disaster, U.S. Ambassador Robert B. Keating announced on March 18 his intention to exercise his disaster assistance authority to contribute to the relief effort.

At the Ambassador's request, medical supplies were procured by USCINCPAC from military sources in the Philippines and transported to Madagascar on a previously scheduled flight. The plane stopped in Mauritius en route to take on an additional quantity of medicines and other supplies — some purchased with funds from the Ambassador's Authority and others donated by the government of Mauritius.

The relief cargo, consisting of vaccines (typhoid, tetanus/diphtheria), medicines (chloroquine tablets, aspirin, penicillin), intravenous fluids, surgical and diagnostic supplies, oral rehydration salts, antiseptics, blankets, and tools (25 shovels, 25 saws, and two large tarpaulins), arrived in Antananarivo on March 20. Total cost of these items was $21,308 ($15,635 for those procured in the Philippines and $5,673 for those purchased in Mauritius). The supplies were put aboard President Ratsiraka's plane the following day for transfer to Toamasina where they were presented to local authorities by the A.I.D. Representative and a CINCPAC physician. The cost of the charter flight was $464. After inventory, the relief items were turned over to the LRCS delegate for distribution. A REDSO/ESA Food for Peace officer and a RHUDO/ESA representative, both resident in Nairobi, joined the A.I.D. Representative and the CINCPAC physician in Toamasina on March 22 to conduct a damage and needs assessment.

At the Mission's request, OFDA sent a two-person contractor team to Madagascar in April to work with the Embassy/A.I.D. staffs to improve disaster response procedures. After visiting Toamasina and meeting with other donors, the team suggested possible additional USG activities in response to continuing needs resulting from Cyclone Honorinina. The costs associated with this assistance were covered from existing OFDA contracts.

With USAID authorization, CRS made P.L. 480 Title II food available from its regular program stocks in Toamasina. The 18.5 MT of rice and 7.5 MT of NFDM, donated on a nonreplacement basis, were expected to feed 5,000 cyclone victims for a 15-day period.

A decision was made by USAID and RHUDO/ESA in June to close out all operations of the Kamisy housing unit project and transfer the remaining building materials to the Toamasina area for distribution to families whose homes had been damaged or destroyed by Cyclone Honorinina. The Kamisy project was initiated in 1984 as an AID/OFDA-supported housing rehabilitation and training program after Cyclone Kamisy devastated the Mahajanga and Antsiranana areas. (See "Madagascar—Cyclones," *OFDA Annual Report FY 1984.)* An estimated 7,700 roofing sheets and 94 bags of cement remained in storage in Mahajanga, along with limited quantities of wood and assorted building tools. USAID Antananarivo and RHUDO/ESA agreed to sell the remaining building materials to Caritas, at the subsidized Kamisy price, for distribution in Fenerive. Under this program, which was expected to benefit 500-700 families, materials would be sold to those people able to pay and donated to the destitute. Proceeds from the sales, beyond Caritas' expenses for operating the program, would go into the GDRM disaster account.

TOTAL $21,772

Assistance Provided by U.S. Voluntary Agencies

CRS—released 18.5 MT of rice and 7.5 MT of powdered milk from regular P.L. 480 program stocks for the emergency feeding of 5,000 cyclone victims for a 15-day period. (See USG Assistance.) Caritas Madagascar handled distribution.

Assistance Provided by the International Community

International Organizations

European Development Fund (FED)—gave $490,196 for the purchase of food and blankets and the reconstruction of public buildings.

EC—provided 200 tons of cereals and 100 tons of powdered milk through the Association Aide au Tiers-Monde, as well as blankets and protein bars distributed by the Malagasy Red Cross; value not reported.

LRCS—on behalf of the Malagasy Red Cross, launched an international appeal for foodstuffs and cash. The LRCS delegate in Madagascar remained in Toamasina throughout the emergency phase, working with Malagasy Red Cross Youth to operate food distribution centers.

UNESCO—donated $40,000.

UNICEF—provided medical supplies and roofing material valued at $150,000.

World Bank—carried out an assessment mission and helped the GDRM coordinate the reconstruction effort. The IBRD planned to finance the rebuilding of the damaged port jetty.

WFP—supplied 10 tons of rice and 500 kg of canned meat, value not reported. The supplies were distributed through the local Red Cross.

Governments

Canada — donated $43,176.

China, People's Rep. — gave 2,000 MT of cement, value not reported. The Chinese community in Antananarivo presented a cash gift totaling $4,329 to the CNS.

France — contributed 2,350 tons of medicine, valued at about $70,000; and 300 tons of rice and 16 tons of roofing sheets, with a total value of approximately $147,000.

Germany, Fed. Rep. — donated $21,459 for the purchase of pharmaceuticals.

Japan — gave $100,000.

Mauritius — donated medical supplies consisting of 10,000 packets of oral rehydration salts, antibiotics, chloroquine tablets, needles, syringes, and other items; value not reported.

Soviet Union — contributed 5,000 tons of cement, 600 tons of iron sheeting, 100 tons of nails, and two trucks; value not reported.

Switzerland — provided $1,970,954 for the rehabilitation of National Road 44 from Ambatondrazaka to the Centre Agricole Du Lac Alaotre.

United Kingdom — gave $240,000 for the reconstruction of public buildings.

Vatican — gave $20,000.

Voluntary Agencies

Australia Red Cross — gave $1,414 through LRCS.

Canada Red Cross — donated $1,439 through LRCS.

Council General of Reunion (under the aegis of the French Red Cross) — provided four tons of medicines, value not reported.

China, People's Rep., Red Cross — contributed medicines valued at $20,000 to the Malagasy Red Cross.

Denmark Red Cross — donated $5,946 through LRCS.

Finland Red Cross — gave $9,524 through LRCS.

France Red Cross — provided food, medical supplies, and gas stoves and lamps; value not reported.

German Dem. Rep., Red Cross — donated medicines, value not reported.

Ireland Red Cross — contributed $6,645 through LRCS.

New Zealand Red Cross — gave $526 through LRCS.

Norway Red Cross — made a cash donation of $15,228 through LRCS for the purchase of tarpaulins.

Soviet Union Red Cross — provided 100 tents, one ton of medicines, and one ton of baby food, value not reported.

Secours Populaire Francais (France) — donated $2,850 for the purchase of relief supplies.

Sweden Red Cross — contributed $13,514 through LRCS.

TOTAL $3,374,200

Cholera Epidemic

Date:
December 1985-March 1986

Location:
Northern Province in Kambia, Port Loko, and Tonkolili districts, as well as Bo and Moyamba districts in Southern Province, and Kanema and Kono districts in Eastern Province

No. Dead:
352

No. Affected:
3,000

The Disaster

Reports of numerous cases of acute diarrheal disease leading rapidly to severe dehydration were received from several districts in Sierra Leone's Northern Province in early December 1985. Kambia District, about 320 km north of the capital, reported an alarming increase in fatalities from what was believed to be acute diarrhea. Cases of acute diarrhea disease are common in the district due to the poor water supply and sanitary system. However, when deaths continued to increase through late December, district Ministry of Health (MOH) officials began to suspect cholera as the cause.

Cholera was confirmed as the cause of deaths following a joint MOH-UNICEF investigation and was traced to the island of Yelibuya, not far from Kambia. By February, the cholera had spread all over the Northern Province and to Kanema and Kono districts in the Eastern Province and Bo and Moyamba districts in the Southern Province. A few cases were also noted in Freetown, the capital. By March, a total of 352 people had died from the disease and 2,045 people were infected out of a threatened population greater than 2.1 million.

Action Taken by the Government of Sierra Leone (GOSL)

The Ministry of Health took prompt action to address the increased incidence of cholera-like symptoms in the districts of Kambia, Port Loko, and Tonkolili. Local Kambia MOH officials requested assistance from UNICEF which joined them in an investigation. A press release was issued advising those traveling in the affected areas to boil all drinking water and maintain high standards of personal hygiene.

The GOSL established a national-level medical committee with representatives from the MOH, WHO, and UNICEF to develop plans to control the outbreak. District-level committees were also established and headed by the senior district medical officer. Rather than transfer the affected patients to central health centers in the towns, the District Medical Committees created mobile medical teams which treated patients where they were found. This program aimed to reduce the spread of the disease. Twenty-two fully equipped health units were set up in the Kambia District, the area of greatest incidence. Four teams were established in Port Loko District and one in Koinadugu District. In addition, more than 100 medical aides augmented medical personnel regularly assigned to the regional hospitals and health centers.

At an emergency meeting with representatives of the MOH, WHO, and UNICEF, a list of emergency medical supplies and equipment required to combat the spread of the disease was compiled. The MOH shared this list with the U.S. Ambassador and other donors and appealed for U.S. assistance in transporting the drugs to Sierra Leone.

By the end of March, the GOSL declared the outbreak under control.

Assistance Provided by the United States Government

Upon receipt of the Ministry of Health press release and subsequent appeal for assistance, U.S. Ambassador Arthur Lewis determined on February 13 that a disaster existed in the Northern Province within the districts of Kambia, Port Loko, and Tonkolili. The Ambassador offered to contribute to the cost of procuring and shipping the emergency medical supplies and equipment identified by UNICEF, WHO, and MOH personnel.

Working through UNICEF, OFDA provided $22,800 to cover the entire cost of the medical supplies and equipment requested. This included oral rehydration salts, tetracycline tablets, disposable needles and syringes, washbasins, cups, water containers, hurricane lanterns, megaphones, and other supplies to stock ten treatment centers in the affected zone. The supplies arrived in Freetown on February 18.

TOTAL $22,800

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

International Organizations

EC — provided a grant of $200,000 in emergency aid to finance a cholera control program to be implemented by Medecins Sans Frontieres.

UNICEF — fielded a team to supervise the distribution of drugs and other supplies and provided overall coordination.

Governments

France — paid for the air freight of drugs provided by the U.S. Government.

Germany, Fed. Rep. — provided an unspecified quantity of drugs.

TOTAL $200,000

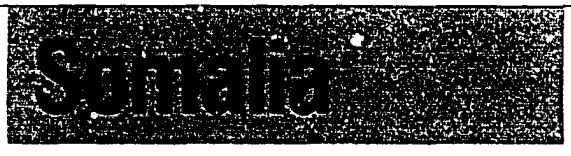
Cholera Epidemic

Date:
May 1985 - May 1986

Location:
Southern Somalia, especially the Bay, Gedo and Middle Jubba regions

No. Dead:
at least 1,307

No. Affected:
at least 7,693 cases



The Disaster

An outbreak of cholera in Somalia in the spring of 1985 took a severe toll in several refugee holding camps in the northern part of the country. (See "Somalia — Epidemic," *OFDA Annual Report FY 1985.*) As the situation in the north was being brought under control, the first signs of an incipient epidemic were noted in the southern districts of Bay, Gedo, and Middle Jubba. During the peak period of March 22-28, 1986, a total of 691 cases and 225 deaths were reported in the Bay region alone. Cases were also reported in the Middle Shabelli District in the south and in the Biyale refugee camp in the northwest during this period. The daily incidence of the disease could not be easily quantified due to inadequate health services and virtually nonexistent communications. Health officials feared that the onset of the rainy season would exacerbate transmission of the disease.

Action Taken by the Government of the Democratic Republic of Somalia (GDRS)

The GDRS convened several donor meetings to alert the international community to the developing emergency and to appeal for assistance in combating the disease. All available statistics on the epidemic were released by the Ministry of Health at a meeting held on April 5, 1986, to coordinate donor contributions.

The Ministry of Health sent assessment and medical teams to the affected districts and attempted to seal off the areas in which cases were concentrated.

Assistance Provided by the United States Government

In response to the GDRS appeal, U.S. Ambassador Peter Bridges determined on April 17 that a disaster existed in Somalia which warranted USG assistance. His disaster assistance authority of $25,000 was applied toward the cost of a UNICEF/Oxfam airlift of medical supplies from Copenhagen to Mogadishu. The supplies were turned over to Ministry of Health officials on April 25.

TOTAL $25,000

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

International Organizations

EC — provided approximately $500,000 in emergency aid, which included funds for dealing with the cholera epidemic.

UNICEF — airlifted 27 MT of supplies from UNIPAC, including 25,000 sets of Ringer's lactate with I.V. sets (500 ml), 6,000 infusion sets, 5,000 tins of halazone tablets, 2,000 tins of sulfa methaxazole with trimethoprin and 6,000 bottles of the same drug in syrup form, 5,000 bottles of cetrimide, and 200,000 packets of ORS. Total value was reported to be $77,910.

WHO — shipped 5,000 bottles of Ringer's lactate and 300,000 packets of ORS, value not reported.

Governments

Sweden — provided unspecified assistance.

Non-Governmental Organizations

Oxfam (U.K.) — provided 8 MT of medicines, shipped on the UNICEF flight. This included 50,000 tablets of cotrimoxazole, 500 bottles (100 ml) of cotrimoxazole suspension, 50,000 erythromycin tablets, 500 bottles of erythromycin syrup, and 100 syringes; value not reported.

TOTAL $577,910

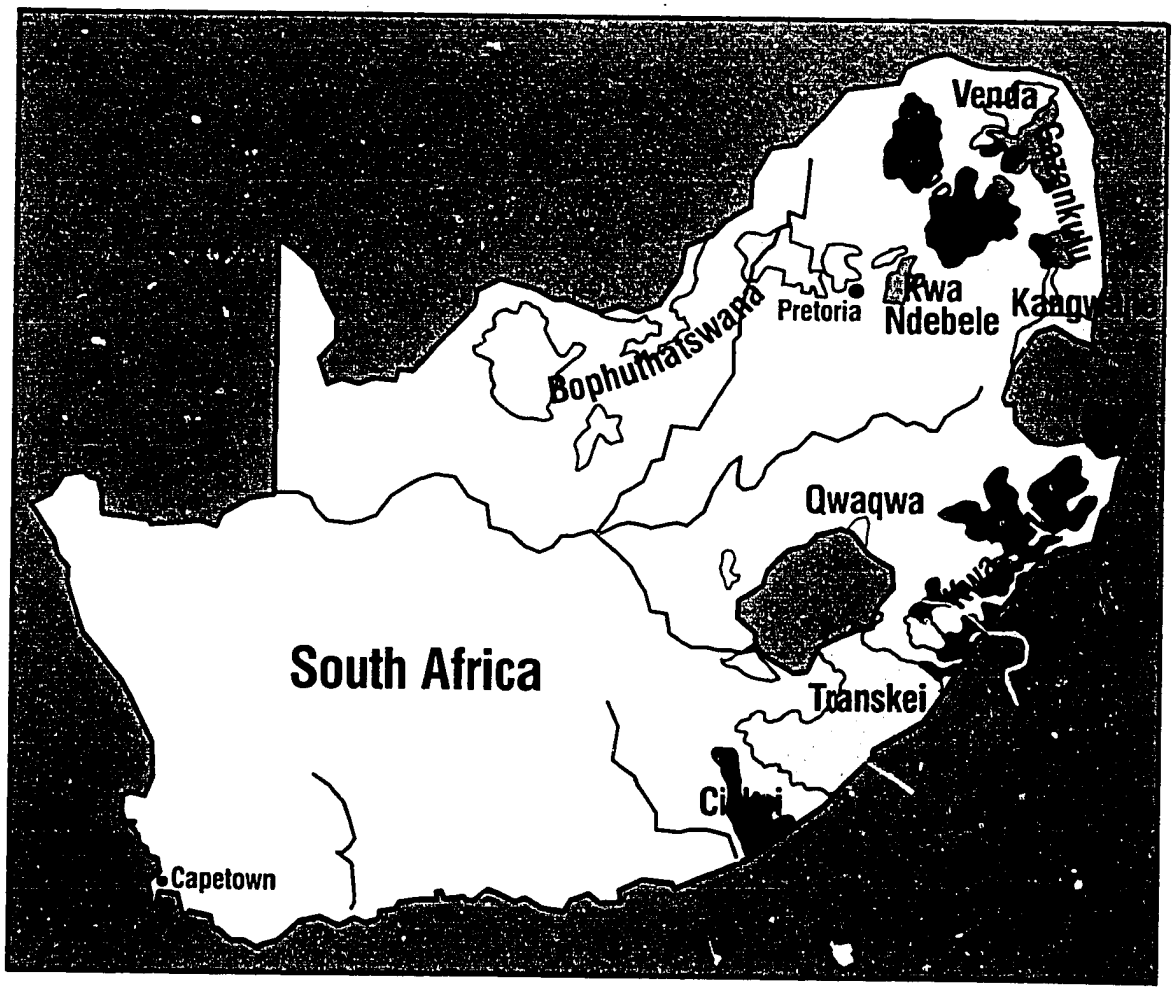
Civil Strife

Date:
May 18-23, June 10-11, 1986

Location:
Crossroads squatter camp, about 19 km southeast of Cape Town

No. Dead:
62 (according to newspaper reports) — 48 were killed in the first round of violence and 14 in the second

No. Affected:
60,000-70,000 (35,000 from the first round)



The Disaster

According to press reports, the South African Government (SAG) had attempted for more than a decade to move residents from Crossroads, a black squatter camp not far from Cape Town, to either the Transkei "homeland" or to another black settlement further away from Cape Town. However, residents refused to be moved. Finally in 1985, the SAG agreed to allow about 40,000 of the approximately 85,000 residents to stay in Crossroads and to upgrade the settlement to a "model urban community" with paved roads and urban services. The remaining people were to be moved to the new town of Khayelitsha, 10 km away.

This proposal appealed to many of the 47,000 residents of Old Crossroads, the oldest section of the settlement. Newer residents did not want to be moved out of Crossroads, fearing that they would actually be "moved" to one of the rural "homelands." Antagonism between the two groups erupted into violence on the night of May 18 when about 1,000 vigilantes from Old Crossroads, calling themselves the Witdoeke ("white rags," after the strips of white cloth which they tied around their necks or pinned to their clothes), attacked the young activists, known as the Comrades, from the satellite sections.

The battle raged for five days until, after setting fire to the shanties in the three satellite sections, the vigilantes finally prevailed. Forty-eight people lay dead; 120 were seriously wounded; and 35,000 residents of the burned out sections were left homeless, forced to seek shelter in community centers or remain in the surrounding bush. The militant Comrades retained control of only one section. On June 10, the vigilantes moved to take over the Comrades' last bastion, and a pitched battle was fought for two days. The Witdoeke expelled the Comrades and burned the remaining shanties.

Action Taken by the South African Government (SAG) and Local Non-Governmental Organizations

According to the U.S. State Department, reports of police complicity with the vigilantes were widespread. The SAG denied this charge, but South African security forces moved into the Crossroads area after the fighting stopped and bulldozed the burned out sections. The SAG provided a limited amount of shelter, food, and clothing only at Khayelitsha, the site where the SAG had orginally wanted to move the squatters.

Several local NGOs provided the bulk of relief assistance to the displaced persons. The South African Red Cross fed 12,000 people daily for more than two months; this covered 77 percent of the total feeding effort. The Red Cross also set up satellite kitchens away from the refugee centers and provided the homeless with kits of stoves, fuel, soap, plastic, and cooking utensils.

St. John's Ambulance provided food for slightly more than 2,000 per day and ambulance service to the townships. The Students' Health and Welfare Committee (SHAWCO), an organization of medical students at University of Cape Town, fed 1,500 people daily and organized mobile clinics to provide medical care. The Nyanga East Zone Committee, the Rotary Club, and the Mbekweni Residents Association also provided relief to the homeless. The latter group comprises the black leadership of a community of 80 families displaced by the fighting at Crossroads. The organization distributed resettlement kits containing food, wood, plastic, and cooking fuel.

Assistance Provided by the United States Government

On May 19, 1986, U.S. Ambassador Herman W. Nickel declared that the situation at Crossroads warranted OFDA disaster assistance. The U.S. Mission and OFDA decided to provide grants to those local private voluntary agencies providing assistance to the victims of the violence at Crossroads. The grants were distributed as follows:

South African Red Cross — $146,600
SHAWCO — $31,720
St. John's Ambulance — $50,000
Mbekweni Residents Association — $15,000
Nyanga East Zone Committee — $5,000

TOTAL $248,320

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

Germany, Fed. Rep. — gave unspecified assistance.

Italy — gave unspecified assistance.

United Kingdom — gave unspecified assistance.

Food Shortage

Date:
1986

Location:
Gazankulu, Kangwane, Lebowa, and Venda homelands in eastern Transvaal Province.

No. Dead:
Unknown

No. Affected:
850,000 in need of food assistance

The Disaster

Thousands of children in the so-called black homelands of South Africa die of malnutrition and disease every year, according to the World Health Organization. The infant mortality rate in the homelands is one of the highest in the world, estimated between 200 and 300 deaths for every 1,000 live births. In addition, in some homeland communities, as many as 65 percent of one to five-year-olds suffer from malnutrition. Nutritional deficiencies, such as kwashiorkor, marasmus, pellagra, and xerophthalmia are prevalent among the black population. The homelands constitute some of the most densely populated areas in the world, and most of the inhabitants live in overcrowded shantytowns without potable water, sanitation, or adequate health services. To further exacerbate the situation, thousands of Mozambican refugees have migrated into the Gazankulu, Kangwane, Venda, and Lebowa homelands in the Transvaal Province of South Africa. According to Operation Hunger, the largest PVO working in the homelands, approximately 850,000 people in these four territories were in need of emergency food rations in 1986.

The underlying cause of the poverty and malnutrition in the homelands is South Africa's system of apartheid. During the 1950s and 1960s, the white minority government forcibly resettled millions of black South Africans into small, segregated, rural enclaves scattered inside the boundaries of South Africa. Although the Government of South Africa considers the homelands to be self-governing or independent countries, not one national government or international organization in the world recognizes them as sovereign nations. The homeland population is entirely dependent on the economy of South Africa for its meager existence. Approximately 60 percent of the black males residing in the homelands work as migrant laborers in the mines or cities located in South Africa. The income from these workers, who earn barely a subsistence wage, accounts for roughly 70 percent of the gross income of the entire homelands. Women, children, the elderly, and the increasing number of unemployed are most in need of emergency food assistance.

Six years of drought have also taken their toll on the population of the homelands. South Africa's corn crop, the main staple of the black South African diet, was reduced by almost one half during the drought. The amount of arable land continues to diminish due to overgrazing, overcultivation, and deforestation. Most of the homelands produce less than ten percent of the food needed to sustain the population. While the white-owned farms in South Africa benefit from irrigation schemes, fertilizers, and farm machinery, the black family farms located in the homelands are denied any state support or private investment by the South African government. As a result, the once marginal pasture and cropland has become a barren, eroded wasteland.

Action Taken by South African Non-Governmental Organizations

Operation Hunger, a South African PVO, manages the largest food assistance program in the homelands. In 1986, Operation Hunger provided daily emergency food rations to approximately 700,000 residents in the Gazankulu, Lebowa, Venda, and Kangwane homelands. The basic food ration consisted of dehydrated protein stew and a portion of mealie meal, the staple of the black South African diet. Churches and local civic organizations served as distribution centers for the emergency food rations. In virtually all cases, communities receiving food assistance were required to implement food gardening programs in an effort to reduce community dependence on donated food. In return, Operation Hunger provided seeds, fertilizer, pesticides, tools, and technical assistance to these communities. Operation Hunger receives most of its donations from local businesses, church groups, non-governmental organizations, and public fund-raising campaigns.

Assistance Provided by the United States Government

Since the South African Government restricts access to the homelands, no qualified group could conduct nutritional assessments in the affected areas. In October 1985, U.S. Ambassador Herman W. Nickel visited the Lebowa homeland, northeast of Pretoria, and saw widespread hunger and malnutrition among the population. Operation Hunger appealed to

Ambassador Nickel to provide a $250,000 grant to continue its feeding program in the homelands. Following Operation Hunger's submission of a funding proposal, Ambassador Nickel declared a food shortage disaster in the homelands on May 23. OFDA agreed to provide a $125,000 matching grant to Operation Hunger, with an additional $125,000 to be allocated in FY 1987. Under the terms of the matching grant, the USG would match one dollar for every three dollars collected by Operation Hunger.

TOTAL $125,000

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

ICRC — provided medical and non-food relief assistance to over 10,000 Mozambican refugees in Gazankulu homeland.

World Vision International — supported a daily feeding program for children, a potable water and irrigation project, and a skills training program for women.

Civil Strife

Please note:
This disaster was declared in August 1986 and remained active at time of publication.

Date:
Protracted civil war; disaster declared August 26, 1986

Location:
Southern Sudan — the provinces of Equatoria, Bahr El Ghazal, and Upper Nile

No. Affected:
Up to 2 million people at risk from starvation

Damage:
Social structure disrupted; herds decimated and agricultural activity drastically reduced

Sudan

The Disaster

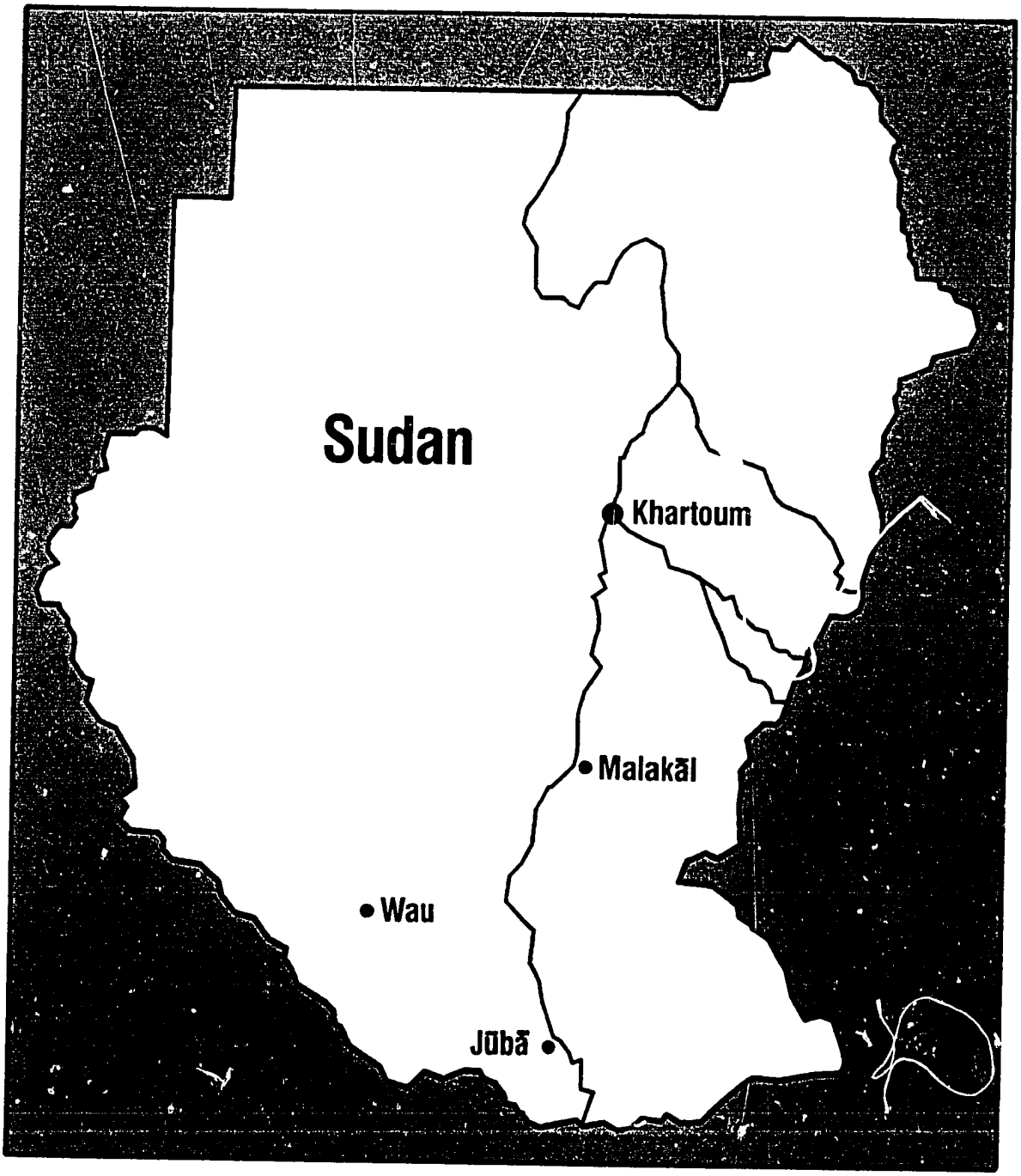
Historic enmity between the Islamic north and the Christian and animist south has flared into intermittent fighting in Sudan over the past 30 years. In the present three-year conflict between the rebel forces of the Sudan People's Liberation Army (SPLA) and the national army of the Moslem-dominated government, hundreds of thousands of people in a vast area of southern Sudan have been put at serious risk of starvation as a result of tactics employed by the opposing sides.

According to rebel leaders, whose chief demand is an end to Islamic law (Sharia) in the non-Moslem south, the rural populations of the SPLA-controlled areas outside the major towns were prevented by government forces from obtaining food. In retaliation, the SPLA blocked all roads and rivers so that food could not reach the government-held garrison towns of Wau, Juba, and Malakal. The food supply was further disrupted by the general insecurity which interfered with normal crop production. By August 1986, near famine conditions prevailed, affecting up to 2 million people.

Relief food shipments came to a virtual standstill after the August 16 downing of a Sudanese civilian airliner by a rebel missile and the subsequent closing of airports in the major towns. Thus, barges loaded with emergency food in Renk and destined for Malakal, and a cargo train carrying food supplies from Babanusa to Aweil, were delayed for weeks before making delivery in November. Insecurity in northern Uganda and inadequate transport infrastructure in both Uganda and Zaire were constraints to the movement of food by road through those neighboring countries. A humanitarian airlift, under the name Operation Rainbow, was undertaken by the government of Sudan and the U.N. after the airports in Juba and Malakal were reopened in September. Flights to Juba and Isiro (Zaire) began on October 12 after many delays, but were suspended less than two weeks later because of continuing security concerns.

As food supplies were exhausted, the movement of people accelerated throughout the region. An influx of 7,000 people weekly raised Juba's displaced population to 50,000 by mid-October. Town dwellers from Wau and Aweil, especially women and children, flocked to the countryside where some food from the meager harvest remained. Much of the traffic was northward, however. By the end of December 1986, an estimated one million displaced southerners had joined the existing urban poor on the outskirts of Khartoum and other northern towns.

The prevailing insecurity and inaccessibility of the affected provinces hampered attempts to assess relief needs. Despite the arrival of limited food shipments in southern Sudan, the situation was still described as precarious in February 1987. According to figures released in late December 1986 by the government's Commissioner of Relief and Rehabilitation, a total of


Sudan
Khartoum
Malakāl
Wau
Jūbā

71,250 MT of relief foods would be required for 1,174,000 people during the first six months of 1987. Identified needs by province were as follows:

Equatoria — 23,000 MT for 312,000 people;
Upper Nile — 9,900 MT for 172,000 people (excluding Jonglai); and
Bahr El Ghazal — 38,350 MT for 690,000 people (excluding Lake Province).

This amount of food would provide full rations for 300,000 displaced and destitute people and half rations for the remaining affected population.

Action Taken by the Government of Sudan (GOS) and Non-Governmental Organizations

With all routes and airspace to the south closed after the Sudanese plane was shot down on August 16, the GOS stated its intention to reopen the transportation links under its control to ensure delivery of food to the needy population.

The Coordinator for the Sudanese Relief and Rehabilitation Commission (RRC), M.K. Shawki, notified U.N. agencies, several embassies, and other potential donors in early September 1986 of the plan for a humanitarian airlift to be organized by the GOS in collaboration with the WFP. The name "Operation Rainbow" was chosen as evidence of its multinational character and mission of goodwill. At the GOS's initiative, the operation was given media attention to gain international support.

The airports at Juba and Malakal reopened on September 14, clearing the way for the airlift; however, the SPLA's rejection of a U.N. request for a guarantee of safe passsage for the flights, and the consequent difficulty in obtaining insurance, delayed the start of Operation Rainbow until October 12. Flights from Khartoum to Juba and Isiro (for onward shipment to Equatoria and Bahr El Ghazal) delivered 320 MT of supplies in the few days before the operation was suspended for security reasons.

The GOS provided police and army protection for other major food shipments within Sudan. Truck convoys with military escorts reached Juba in August and again in November, carrying WFP and EC foodstuffs. Armed escorts also accompanied the 40 barges carrying 2,350 MT of relief commodities and 8,000 MT of commercial food to Malakal on November 7, and the 22-car train which delivered food and other supplies to Aweil on November 8. Convoys were later organized to deliver relief supplies to Wau, via Aweil and Tambura.

The GOS supported both the first- and second-line approaches proposed by UNEOS and WFP to care for displaced southerners in the north. The first-line approach, a plan to establish feeding centers at accessible sites on the periphery of the south, was never vigorously pursued because several of the locations were considered unsafe. The RRC Commissioner appointed a Working Group to conduct an assessment of the numbers and status of displaced persons who had passed through the first line and arrived in Khartoum, Kosti, and other more northern cities. Local voluntary agencies and churches played a major role in registering newcomers and providing assistance. By the end of December 1986, the Sudan Council of Churches (SCC) and Sudanaid had surveyed 27,000 families in the Khartoum area and given assistance to 5,600 families. A combined (RRC, Sudanaid, UNICEF) ad hoc committee planned a further survey to assess the nutritional and economic needs of the urban migrants. In addition to their activities with displaced southerners in urban areas surrounding Khartoum, the SCC and Sudanaid conducted food distribution programs in Bahr El Ghazal and Upper Nile and arranged the loading of the relief barges in Kosti. The SCC also initiated a cattle vaccination campaign in Upper Nile.

Local coordination groups active in each of the affected provinces worked with PVOs in the distribution of relief supplies. The Wau Emergency Relief Committee (a combined effort of Catholic and Episcopal churches) and the Relief Agency Coordinating Committee in Malakal served the Bahr El Ghazal and Upper Nile provinces, respectively. In Equatoria, the Combined Agencies Relief Team (CART) delivered relief food to rural areas near Juba as well as to the town itself. CART distributed the supplies transported to Juba by WFP convoys and Operation Rainbow.

The Technical Committee for Coordination of the Southern Sudan Emergency, a group comprising PVOs, donors, and UNEOS, met weekly under the auspices of the RRC. At a December 29 meeting called by UNEOS and the RRC, Commissioner Shawki identified an immediate

need of 71,250 MT of basic food commodities for southern Sudan for the first six months in 1987. He appealed to the USG and other donors to provide food to meet those requirements.

A commission designated by the RRC and chaired by WFP's Management and Logistics Team (MALT) developed a logistics plan to transport the required food to the three affected provinces. Major donors and PVOs participated in the development of the plan. As of late January 1987, the logistics capacity to move food to southern Sudan before the rainy season was calculated to be 33,400 MT, roughly equal to what had been committed by donors at that time but less than half the required total.

Assistance Provided by the United States Government

The A.I.D. Mission staff monitored events in southern Sudan, meeting with representatives of ICRC and other NGOs in an effort to assess needs and determine an appropriate response. U.S. Ambassador Hume Horan issued a disaster declaration on August 26, 1986.

In a press release on August 28, A.I.D. Administrator M. Peter McPherson appealed to the GOS and the SPLA to allow desperately needed food and other supplies to reach those in need. The A.I.D. Offices of Foreign Disaster Assistance and Food for Peace were prepared to assist the relief effort as opportunities for delivering food and relief supplies occurred.

With FFP approval and REDSO/ESA assistance, the Mission arranged a swap agreement with the government of Kenya to exchange 2,190 MT of P.L. 480 Title II bulk wheat, valued at $1,906,000, for 3,000 MT of Kenyan white maize. Under terms of the agreement, the Kenyan National Cereals and Produce Board would release the maize to implementing agencies identified by USAID/Khartoum for distribution in southern Sudan. As of March 1987, 1,000 MT had been allocated to CRS, 1,500 MT to WVRO, and 500 MT to CWS. A shipment of 500 MT of pinto beans for the ICRC program was also approved by FFP. The total value of the beans (commodity and transport) was $437,500.

Other USG food stocks already in-country were utilized, as well. The Mission funded the airlift of 500 MT of commodities, mainly milk products, donated to Operation Rainbow. The food supplies delivered by train to Aweil in November 1986 included sorghum from the previous year's drought relief program. In addition to food, the Mission released a total of 80 MT of fuel to support southern Sudan relief activities.

The Mission participated regularly in meetings of the Technical Coordinating Committee, chaired initially by UNEOS, then by the RRC. In response to the RRC's request for assistance in meeting identified food requirements for the first six months of 1987, the Mission pledged an initial 12,000 MT of commodities. Over 2,300 tons of this amount were loaded on barges in Kosti in February 1987 for departure to Malakal. The Mission also intended to pay transport costs of 1,000 MT of relief supplies on the barges. Along with other donors, Mission staff participated in the development of logistics plans for moving much needed supplies to the south before the beginning of the rainy season in April.

The Mission's own strategy to help ease the suffering of the population in the south was enunciated in February 1987. The objectives were to strengthen the indigenous PVOs providing relief services in affected areas; create strategic food reserves; evaluate and improve key logistic and transport systems; facilitate the early return to villages of displaced persons; and provide technical assistance and leadership to the collaborative efforts of the GOS, the U.N., other donors and private groups.

With the Mission's concurrence, OFDA provided a grant in the amount of $406,717 to WVRO in January 1987 as start-up funds for a food delivery effort in and around the town of Wau in Bahr El Ghazal. The grant covered some of the costs of staffing, logistics, fuel, and the leasing of vehicles. The Mission agreed to provide local currency to fund transport costs, the local hire of personnel, and other contributions.

Total OFDA FY 1987	$406,717
Total FFP FY 1987	$2,343,500
TOTAL	**$2,750,217**

Assistance Provided by U.S. Voluntary Agencies

CARE — helped conduct surveys of displaced persons in Kadugli.

CRS — received 600 MT of Kenyan maize from the USAID swap program for distribution in Equatoria.

Mennonite Central Committee — donated 500 MT of beans to CART, value not reported.

SCF — gave 500 cooking pots, valued at $12,142, for distribution by CART.

USA for Africa — provided $385,000 to WVRO for food transport to Wau.

WVRO — undertook a six-month relief program in the area of Wau, using food provided by the USG and other donors and up to 2,400 MT of commodities purchased by WVRO in Zaire. Food will be prepositioned in Yambio (near the Sudan/Zaire border), then reloaded onto Sudanese trucks and carried to storage facilities in Wau. WVRO intends to construct and repair roads and bridges between the two towns to make transport possible. Along with the delivery of the initial food supply, WVRO plans to send a health/nutrition/medical team to visit all areas in which food is distributed. WVRO's contribution of $125,000 is expected to support the cost of food purchases, additional start-up costs, and general operational expenses. (See also USG Assistance.)

TOTAL $522,142

Assistance Provided by the International Community

International Organizations

EC — a major food donor in southern Sudan, had committed 8,715 MT of food as of mid-October 1986. At the time, this included 300 MT en route via Zaire; 1,265 MT being transported by train to Aweil; 2,000 MT of sorghum in Ed Daien; 1,000 MT on hold in Kenya; 1,000 MT provided to WFP in Kenya; 400 MT in Kosti to be sent via barge to Malakal; 700 MT in Gedaref; and 50 MT on hold in Khartoum for an airlift. Truck convoys carrying EC-donated food reached Juba in August, November, and December, and an airlift of five flights from Khartoum to Juba delivered 150 MT of food in November. The EC also donated at least 100 MT of diesel fuel for Juba; the value of food and fuel was not reported. The EC has developed a plan for relief operations when conditions permit known as the European Community Emergency Program, South (ECEPS). The overall estimated budget for the plan is 8,740,000 ECU (approximately $8.4 million) and includes an assessment team, food relief, medical and rehabilitation programs, management support to the RRC, and financial and technical assistance for emergency repairs to barges and rail transport.

ICRC — from Lodwar and Lokichokio in Kenya, operated a feeding station for some 20,000 displaced persons in Narus, Sudan, distributing directly to those who lived in Narus and via landbridge for the majority who lived some distance away; delivered 40 MT of food to Wau by air prior to suspension of the program with the downing of the Sudanair plane. The ICRC planned to reduce its presence in Narus as the displaced persons began their traditional migration away from that area. The ICRC will be providing those returnees food, agricultural supplies, and other needed commodities.

UNEOS — was the lead agency in the southern Sudan relief program in the early months; chaired the Technical Committee for Coordination of the Southern Sudan Emergency. This function was later assumed by the Coordinator of the RRC.

UNICEF — with other NGOs, carried out a nutritional survey in Malakal and feeding programs in first- and second-line approach towns; gave $100,000 to Operation Rainbow; provided food to churches and local relief committees for child feeding programs in Equatoria.

WFP — had committed 2,610 MT of food as of mid-October 1986 to the southern Sudan relief effort. The WFP's Management and Logistics Team (MALT) coordinated food donations for Operation Rainbow, arranged several truck convoys, and assisted the RRC in developing a logistics plan to transport food to the south before the onset of the 1987 rainy season. The WFP also donated $250,000 in cash to Operation Rainbow and food valued at $453,200 for 20,000 malnourished children.

Governments

Australia — donated 400 MT of food for Operation Rainbow, value not reported.

Austria — planned to purchase 750 MT of maize in Kenya, value not reported.

Canada — provided $255,000 for Operation Rainbow and 500 MT of peas, value not reported.

Denmark — donated $261,438 through UNICEF.

France — contributed $600,000 for Operation Rainbow.

Germany, Fed. Rep. — provided 1,000 MT of food distributed by ICRC, value not reported; $222,772 through UNICEF for Operation Rainbow; and $502,513 to SCC for the purchase of seeds and tools for Bahr El Ghazal.

Ireland — provided $67,625 through WFP for Operation Rainbow and an additional $207,342 for food transport.

Italy — pledged 9,500 MT of rice, value not reported; and provided 73 trucks to the GOS for the transport of emergency food supplies and rehabilitation activities in the south. The trucks carried 200 MT of rice, supplemental food, and medicine (donated by the Italian government, Sudanaid, and UNICEF) from Khartoum to Wau in early January in a U.N.-sponsored convoy.

Netherlands — donated $200,000 for Operation Rainbow.

Sweden — gave $71,942.

United Kingdom — supported the activities of CART.

Non-Governmental Organizations

CAFOD (U.K.) — provided 10 MT of oil, value not reported, and, with several other British voluntary agencies, supported the activities of CART.

Irish Concern — worked in the first-line approach to establish feeding centers for vulnerable children in Renk.

Norwegian Church Aid — provided 1,000 MT of food for the ICRC program; airlifted 525 MT of cereals from Nairobi to Juba in November for distribution on the East Bank; value not reported.

Oxfam/U.K. — provided food, medicine, blankets, and plastic sheeting, all valued at $311,285, and the services of a nutritionist through CART, valued at $9,532. Oxfam also planned to buy and distribute seeds for farmers in the Juba area and to conduct a cattle vaccination campaign in Equatoria and Bahr El Ghazal.

Saudi Arabia Red Crescent — assisted with surveys of displaced persons in Khartoum.

TOTAL $3,512,649

Displaced Persons

Date:
March 1986

Area Affected:
Luwero Triangle (Luwero, Mubende, and Mpigi districts north and northwest of Kampala), Mbarara area (southwestern Uganda), Lira and Gulu areas (northern Uganda), and the West Nile Province

Dead:
Not reported

Affected:
1,000,000 estimated by GOU; about 700,000 of this number in the Luwero Triangle and 25,000 in Mbarara

The Disaster

Uganda has been the scene of prolonged civil strife and terrible atrocities. Beginning in 1971, Idi Amin's eight-year reign of terror brought economic decline, social disintegration, and massive violations of human rights. The country suffered further abuses under subsequent military governments that gained control by force. As many as one million Ugandans were displaced as a result of these years of violence, insecurity, and destruction.

In late January 1986, a takeover of the government by the National Resistance Movement (NRM) put President Yoweri Museveni in power and signaled the end of hostilities. Museveni's policy of reconciliation with partisans of former regimes as well as the restored stability and security in previously war-torn areas prompted the return of Ugandans who had fled to neighboring countries. In late 1985 and early 1986, approximately 29,000 Banyarwandan refugees had already returned to Uganda from Rwanda staying initially in a reception center and later, after the NRM takeover, returning to their homes in the Mbarara and Rakai districts in southwestern Uganda. Between 1979 and 1983, more than 350,000 Ugandans fled to southeastern Sudan from the West Nile Province. By March 1986, the NRM had established law and order in this region, and, by June 1986, 105,000 people had returned there. Others came back from Kenya and Zaire. As a result of this influx, as well as displacement within the country, hundreds of thousands of displaced people resettled in abandoned and looted areas without the basic necessities to sustain family life or restore agricultural productivity.

About 200,000 of the estimated affected population relocated in the districts of Luwero, Mubende, and Mpigi (the Luwero Triangle), just north and northwest of Kampala. Another 25,000 displaced persons were identified near Mbarara (in the southwest) and others in Lira and Gulu. The tragedy and devastation experienced throughout the Luwero Triangle over the last several years were evidenced by piles of skulls and other human remains placed along roadsides. The physical destruction — of homes, trading centers, schools, churches, etc. — was also manifest. Economic productivity also suffered a tremendous decline, as farms and market roads were overgrown with vegetation and supply centers were leveled.

Action Taken by the Government of Uganda (GOU) and Non-Governmental Organizations

As more areas of the country came under NRM jurisdiction, the overall security situation stabilized and economic activity resumed. The NRM's Emergency Relief and Rehabilitation Program (ERRP), with a total budget of $161 million, used its resources to help resettle displaced persons and restore basic industries and services. The GOU, NGOs, and donors worked together to avoid duplication and formed an NGO Aid Coordination Subcommittee.

The Uganda Red Cross (URC) chaired donor meetings in March and worked with LRCS to provide assistance to 75,000 people resettling in the Luwero area. The URC and LRCS also surveyed the southwest and areas in northern Uganda, when security permitted, in order to assess needs and plan the distribution of family kits in the Luwero Triangle and in eastern Uganda.

The Church of Uganda, using funds provided by Lutheran World Federation, distributed 7,500 family kits along the southern edge of the Luwero Triangle to the west and southwest of Kampala. Among relief items distributed were beans and maize seed, blankets, hoes, and pangas (a curved machete-like tool). It also provided medical assistance in Soroti (in eastern Uganda) and the West Nile. The Catholic Secretariat worked in the area north of Kampala distributing seeds and hoes.

The Ministry of Health provided mobile medical teams in the Luwero Triangle and Soroti, where the teams also distributed some food. The Ministry of Foreign Affairs provided food throughout the country while the Ministry of Works began implementing repairs on major roads to facilitate relief distribution.

Assistance Provided by the United States Government

On March 28, 1986, because of the growing number of displaced persons in Uganda, U.S. Ambassador Robert G. Houdek declared that a disaster existed. The U.S. Embassy requested OFDA funding for family kits.

OFDA immediately approved $250,000, to be used by LRCS to purchase blankets, saucepans, hoes, 12,000 pangas, and seeds for 13,130 family kits (benefiting approximately 65,000 persons). Kits provided by OFDA were distributed mostly in the districts of Mpigi and Mubende in the Luwero Triangle.

USAID/Kampala's program plan for Uganda supported immediate resettlement priorities and medium- and long-term economic and development objectives. The combination of OFDA-funded self-sufficiency kits and agricultural inputs from ongoing West Nile and Food Production Support Projects contributed to the resettlement and rehabilitation efforts.

Two A.I.D./Washington personnel, Timothy Knight, Director of OFDA's Africa and Europe Division, and Brian Kline, Director of A.I.D.'s Office of East African Affairs, visited Uganda from April 20-26 to review emergency needs. They traveled by road through the northwestern districts of Arua and Moyo, Guiu, Lira, and the Luwero Triangle. Based on team recommendations, OFDA approved an additional $250,000 in a grant to LRCS for another 13,130 family kits. In addition, OFDA provided 52,000 A.I.D. emblems, at a cost of $5,018, to label A.I.D.-donated supplies.

Two hydrology experts from WASH (Water and Sanitation for Health) conducted a three-week assessment of water needs and conditions, surveying potential potable water sources in war-ravaged areas. They identified emergency rehabilitation needs of both urban and rural water systems and recommended the installation of replacement pumps for boreholes in the towns of Moyo, Arua, and Lira, and support for UNICEF's welldrilling and rehabilitation project. OFDA provided a total of $550,000 for these projects ($290,000 to UNICEF to rehabilitate 119 borehole wells and pumps in the West Nile Province, and $260,000 to two local firms for rehabilitation of the municipal water systems mentioned above).

Summary of USG Assistance

26,260 family kits (through LRCS)	$500,000
52,000 A.I.D. emblems	$5,018
Grant to UNICEF for an emergency rural water program	$290,000
Contract with local firms for rehabilitation of urban wells	$260,000
TOTAL	**$1,055,018**

The restoration of hand-pumped boreholes was urgently needed in war-ravaged areas.

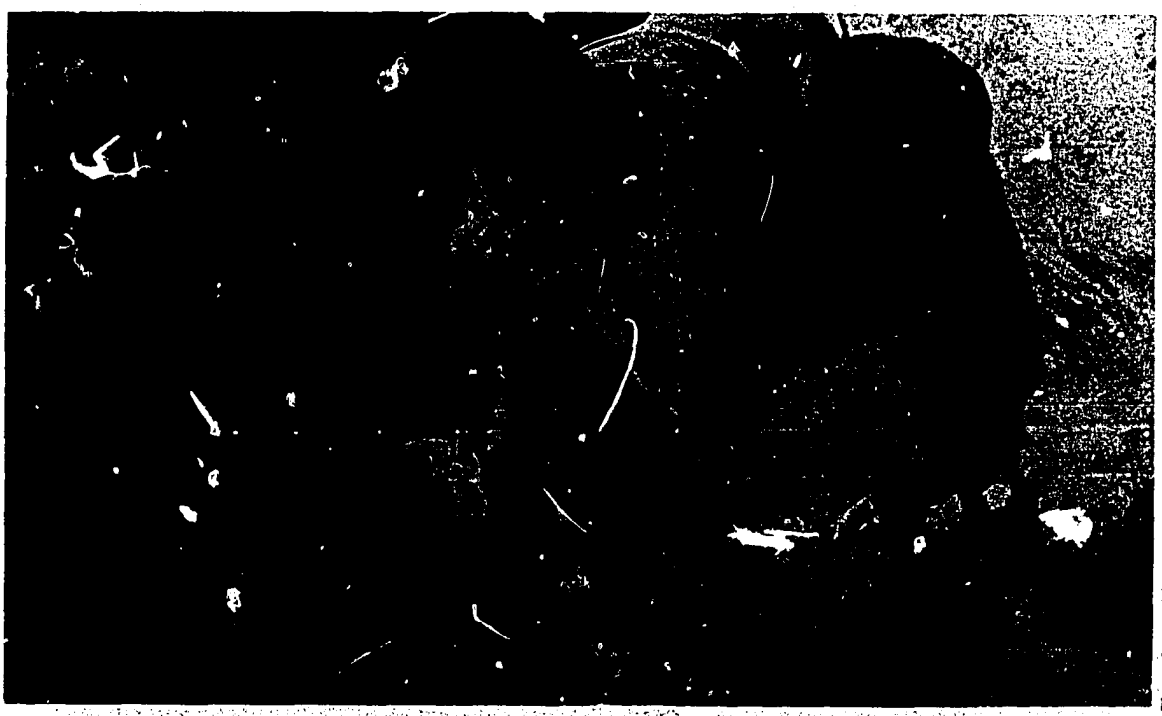


Photo Courtesy of UNICEF

Assistance Provided by U.S. Voluntary Agencies

CARE — with USAID/Kampala, provided a survey team to assess needs in the West Nile and worked with UNICEF on its emergency water program.

Assistance Provided by the International Community

International Organizations

EC — contributed $240,000 through LRCS for family kits; also donated 500 MT of skimmed milk powder, valued at $337,000, and 100 MT of butteroil, valued at $120,000.

ICRC — in cooperation with the URC, distributed family kits including seeds, tools, blankets, soap, and cooking utensils to about 20,000 families in the Luwero Triangle; in the north, provided asylum to about 1,000 civilians fleeing the conflict in March; distributed food and blankets at Arua; helped with the distribution of medical supplies in the West Nile; surveyed needs in eastern Uganda (Karamoja); and operated transit centers for the displaced.

LRCS — distributed family kits to approximately 40,000 families, mainly in Luwero and northern Uganda; and with the URC, surveyed the country's southwestern and northern regions.

LWF — worked with the Church of Uganda to distribute family kits and to rehabilitate schools, clinics, and water sources for 70,000 Ugandans in the West Nile who had recently returned from Sudan.

UNDP — started a pilot agricultural rehabilitation project in the Luwero Triangle.

UNHCR — monitored conditions of returning refugees in the southwest and in the West Nile region.

UNICEF — implemented an emergency water project in conjunction with OFDA, the Swedish disaster team, and CARE.

WFP — diverted 4,600 MT of maize to Uganda.

Governments

Canada — contributed $72,000 through LRCS for family kits.

Germany, Fed. Rep. — donated medical supplies, worth $1,000,000, channeled mostly through German Emergency Doctors, and $6,530,000 for trucks, spare parts, and other commodities.

Italy — pledged $30,000,000 to the GOU, of which $5,000,000 was to be allocated for fisheries, health, and agriculture, and the balance for sectors specified by the GOU.

Sweden — planned emergency aid totaling $2,000,000.

United Kingdom — contributed $1,391,982 to be channeled through ICRC, LRCS/URC, and Oxfam for family kits and committed an additional $5,567,928 to the GOU for agricultural rehabilitation and spare parts for the electricity grid.

Non-Governmental Organizations

Denmark Red Cross — contributed $55,000 through LRCS for family kits and delivered drugs to the Soroti area of eastern Uganda.

Dutch Interchurch Aid (DIA) — provided funds for child nutrition projects.

Euro-action Accord — distributed 50,000 hoes in the north.

German Emergency Doctors (GED) -- operated two medical teams at Makaseke Hospital which handled upward of 300 outpatients per day.

MSF — provided health services in Luwero.

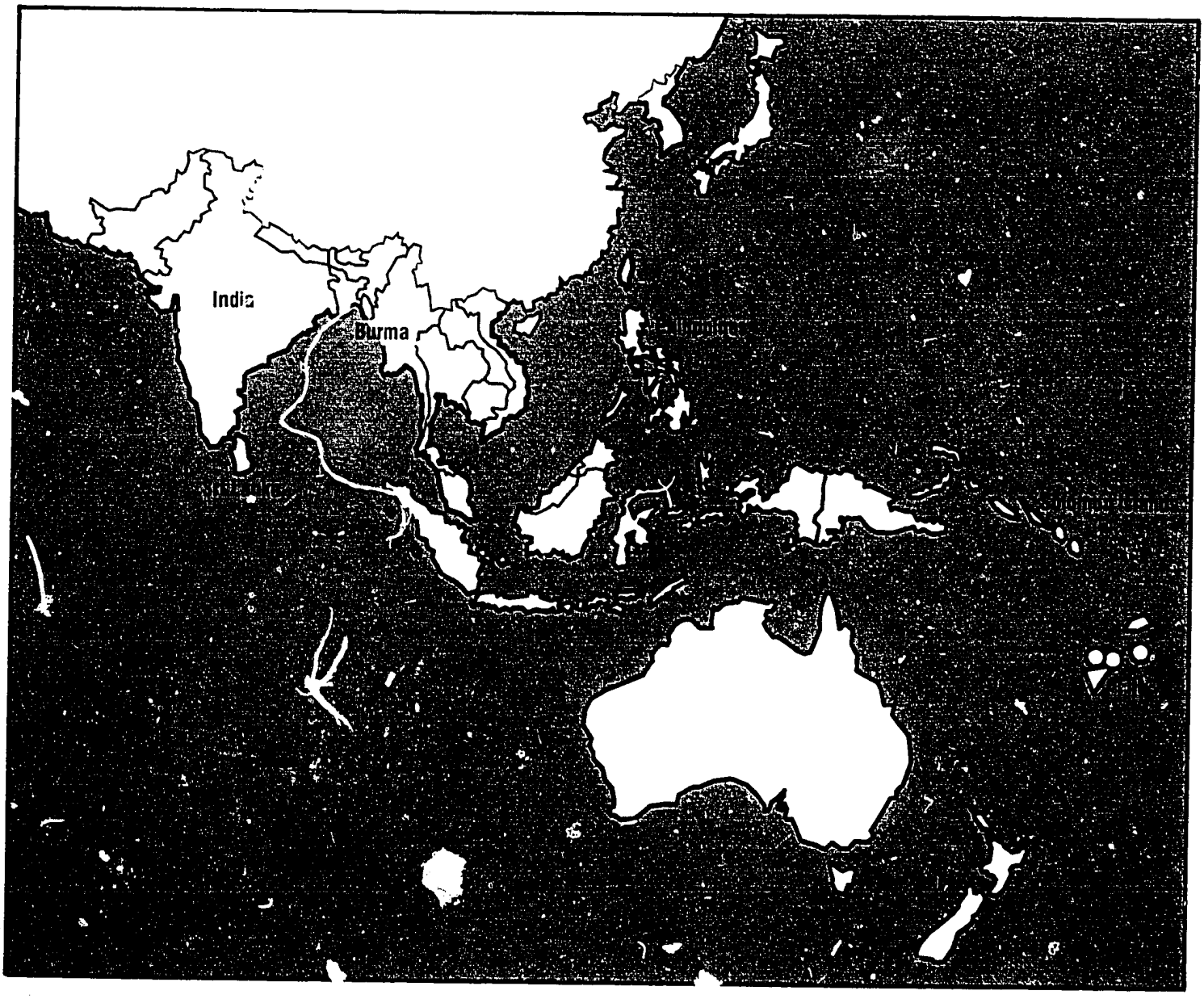
Oxfam/U.K. — distributed clothes to children in selected sites in Luwero District and brought in oxen and plows to the Luwero region.

SCF/U.K. — has been working in the Luwero Triangle since 1983; conducted nutrition surveys and distributed food, soap, and medicine to children's homes in Kampala and nutritional clinics in Luwero and surrounding areas. SCF sent a technical advisory team to assist an immunization program and another team to assist in the rehabilitation of Mulago Hospital.

United Kingdom Red Cross — contributed $114,000 through LRCS for family kits.

TOTAL $15,427,910

ASIA AND THE PACIFIC



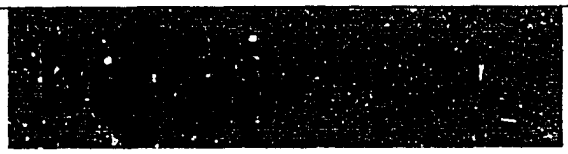
Fire

Date:
March 4, 1986

Location:
Sinmalaik and Thingangyun sections of Rangoon

No. Dead:
1

No. Affected:
21,500



The Disaster

At approximately 1:30 a.m. on March 4, 1986, a major fire began in a residence near the railroad and Kyandaw cemetery in Ward 6 of the Sinmalaik section of eastern Rangoon. The fire started from an open cooking fire and was fanned by light breezes, causing it to quickly spread over a densely populated area. The flames eventually moved across an area about 650 m from the point of origin. About 1,900 homes were destroyed and an estimated 3,885 families displaced. One person was reported killed, and 40 were injured. Additional structures destroyed included a primary school, a library, a ward council office, a match factory, 15 monasteries, and a cooperative.

Later that same day, another large fire broke out in the Thingangyun section of Rangoon. This fire gutted 500 homes and left 2,500 people homeless.

During the latter part of the dry season, from March to mid-May, low-income Burmese residential areas become especially vulnerable to fires. Most houses in such areas are built of highly flammable teak and bamboo frames with thatched roofs. In addition, kerosene lamps and open cooking fires, the usual sources of light and energy, add to the fire hazard. This year's fire in Sinmalaik was significantly larger in area and impact than similar fires that have occurred in Rangoon in recent years.

Action Taken by the Socialist Republic of the Union of Burma (SRUB)

The Burmese relief effort was organized by an emergency disaster relief committee chaired by Colonel Kyaw Thein, chairman of the Rangoon Division of the People's Council. As is standard for such fires, the Council coordinated donations of food by people in the neighboring wards and identified emergency relief sites for people to establish temporary shelters.

The Council and the Burma Red Cross then set up makeshift bamboo and thatch shelters. Within 24 hours, the Red Cross had established three clinics in the Sinmalaik section and one in Thingangyun. Volunteers passed out fresh water containers and distributed emergency supplies to each family. These included a blanket, two aluminum cooking pots, one lungi, three yards of cloth, and a one-week ration of rice, cooking oil, and salt.

Assistance Provided by the U.S. Government

On March 5, 1986, Acting Chief of Mission William E. Spruce determined that the Rangoon fires of March 4 constituted a disaster. Consequently, the USG gave a check to the Burma Red Cross for 175,000 kyat, equivalent to US $24,000. The funds were used to purchase 4,600 blankets and 2,230 lungis for people displaced by the fire.

OFDA commended the Rangoon Mission for its excellent assessment and situation reports. These were deemed to be exemplary of disaster reporting.

TOTAL $24,000

Assistance Provided by U.S. Private Voluntary Agencies

None reported

Assistance Provided by the International Community

International Organizations

EC — made a cash contribution of $98,039 to the Burmese government.

LRCS — issued an appeal for clothing, towels, blankets, and medicines.

UNDRO — sent a delegate to study fire vulnerability and preventive measures, and in conjunction with WHO, procured and transported medical supplies (paid for by Norway).

Governments

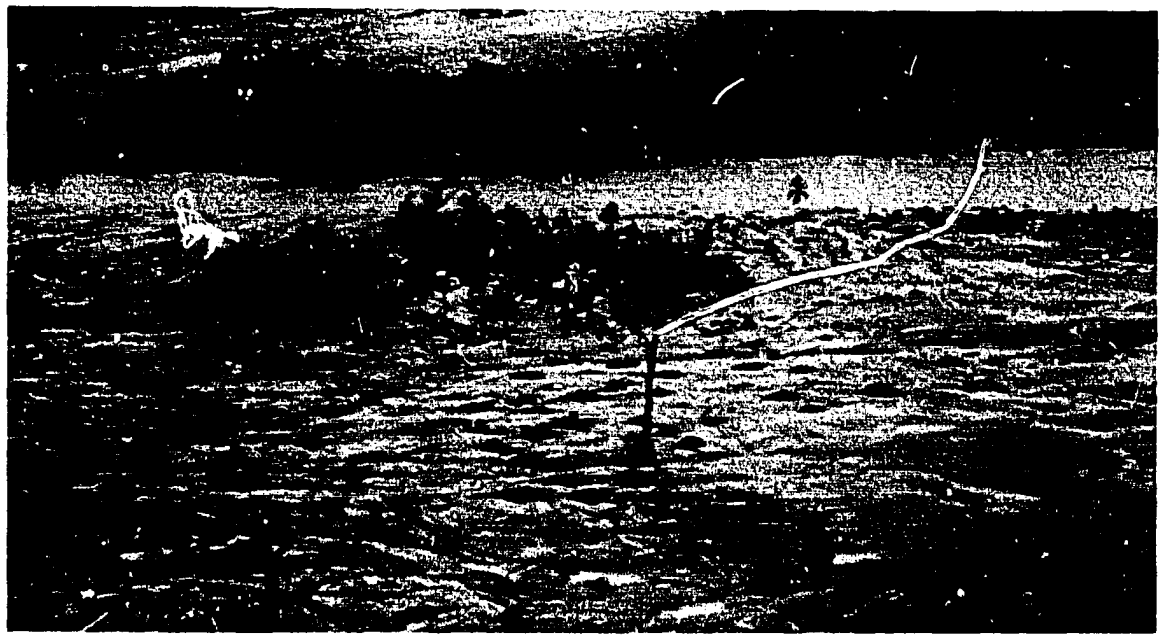
Australia — donated $10,714 to the Burma Red Cross.

Germany, Fed. Rep. — gave $14,545.

Norway — provided $4,000 through UNDRO for the purchase and transport of medical supplies.

United Kingdom — contributed $14,151.

TOTAL $141,449



Floods/Cyclone

Date:
Cyclone: April 12-13, 1986
Flooding: April 17-23, 1986

Location:
Cyclone: Vanua Levu, from Labasa to Undu Point
Flooding: Central Division, especially Suva

No. Dead:
Cyclone: 2 Flooding: 17

No. Affected:
Cyclone: 15,000
Flooding: 200,000

Damage:
Cyclone: The cyclone destroyed or damaged 1,822 houses and 34 classrooms. Sugar, kava, coconut, and rice crops were damaged.
Flooding: Flooding and landslides in the Central Division wiped out roads, bridges, and houses. Damage to pumping stations disrupted the city's piped water supply for several days.

The Disasters

Cyclone Martin raced through the second largest island in the Fiji group, Vanua Levu, and smaller surrounding islands on April 12-13. The cyclone, with winds over 65 knots, left a trail of devastated crops, bridges, and buildings approximately 65 km wide. Sugar crops suffered the greatest damage, unofficially estimated at $9 million.

Storms and torrential rains immediately preceded and followed the cyclone. Soon after Martin passed by, a second cyclone began to form about 650 km north of the Fiji group. This second weather system became a slow-moving depression rather than a cyclone. It caused extremely heavy rains on April 17-18, bringing widespread flooding to the eastern part of Fiji's main island of Viti Levu. Areas bordering the Rewa River and its tributaries were devastated by the storm which released an estimated 740 mm of rain within a 24-hour period. Flooding forced Nausori Airport to be closed for one week and severely affected Suva, the capital city. Landslides demolished houses and blocked many roads, cutting off entire communities. Hundreds of people were trapped as the floodwaters submerged their homes and livestock. More than 8,000 people were temporarily sheltered in evacuation centers operated by the government. Blockages of silt at the pumping stations caused the shut off of piped water to about 200,000 people in the Suva/Nausori area for several days. Repair/replacement costs for various sectors were estimated as follows: posts and telecommunications — $275,229; water systems — $344,037; roads and bridges — $5,412,844; electric utilities — $91,743; and housing (Suva district only) — $275,229.

In a related catastrophe, a barge delivering relief supplies to cyclone-stricken Vanua Levu capsized during the storms, killing eight people.

Action Taken by the Government of Fiji (GOF) and Non-Governmental Organizations

Fiji's Emergency Services Committee (EMSEC) was activated on April 12 in response to Cyclone Martin. EMSEC workers used government vehicles to evacuate villagers in the storm's path. In the aftermath of the cyclone, EMSEC officials toured the stricken area by helicopter and sent out survey teams. Based on survey results, donor governments and international organizations were asked on an individ-

ual basis to supply relief items and assistance. Within a few days, the GOF had distributed tents and food rations from government supplies to the most needy cyclone victims. As EMSEC's emergency role in the cyclone disaster began to wind down, responsibility for the relief effort shifted to the Prime Minister's Relief and Rehabilitation Committee which addresses long-term needs.

EMSEC was reactivated on April 17 in response to new storms and massive flooding in the Central Division. Sixty-eight evacuation centers were set up for people affected by the floods. The GOF utilized private boat owners to assist in the evacuation. The flood damage was assessed by helicopter and survey teams were sent out. However, landslides blocking major roads and the unavailability of aircraft prevented the teams from completing the assessments for several days. The military was deployed to re-establish communication with affected areas, and the Public Works Department cleared roads and delivered water in Suva and environs by tank truck. The Ministry of Health, fearing an outbreak of infectious diseases, issued warnings to boil water and destroy mosquito breeding grounds.

On April 22, the Foreign Secretary called a meeting of all heads of diplomatic missions for a briefing. Donor representatives were later presented with specific requests and were asked to respond. Local voluntary agencies carried out relief efforts under the informal leadership of the Fiji Red Cross (FRC). The Seventh Day Adventists and Fiji's Methodist Youth Fellowship were also heavily involved in relief work. The Seventh Day Adventists contributed $34,400 to the relief effort. The FRC distributed food packs, blankets, and other relief assistance, all valued at $17,000. Fiji's national airline, Air Pacific, donated cargo space for goods collected in Australia.

Assistance Provided by the United States Government

On April 21, U.S. Ambassador C. Edward Dillery determined that a disaster existed in Fiji and used his Ambassador's Authority of $25,000 for the local procurement of pharmaceuticals, medical supplies, and insecticides. OFDA contributed an additional $19,096 for these supplies.

OFDA also supplied equipment requested by the GOF Ministry of Health to help prevent an outbreak of dengue fever and Ross River fever (both endemic in Fiji). The supplies included 24 backpack sprayers and 24 sets of respirator masks, hard hats, gloves, and splash goggles, all valued at $3,123. In addition, USAID/Suva requested that OFDA provide spare parts for two vehicle-mounted sprayers that were donated by the USG in the cyclones of 1985. The spare parts cost $383.

To reduce the public hazard posed by the increased presence of rats in the flooded areas, OFDA gave a supply of rat poison valued at $2,204.

TOTAL $49,806

Assistance Provided by U.S. Voluntary Agencies

CWS — donated $5,000 in cash from the Executive Director's Emergency Fund.

TOTAL $5,000

Assistance Provided by the International Community

International Organizations

FAO — contributed $8,000 for a foodcrops reactivation scheme.

LRCS — gave a grant of $10,152 to the Fiji Red Cross.

WCC — gave $10,000 to the Fiji Methodist Church and issued an appeal for $30,000.

WFP — donated canned fish for free distribution to the affected population, valued at $123,000.

Governments

Australia — donated $280,374 for roofing iron and building material through the Australian High Commission; shipped 40 tons of blankets and clothing donated by the public, value not reported.

Japan — provided $103,681 which included the cost of sending two medical teams.

New Zealand — provided reconnaissance aircraft, value not reported.

United Kingdom — gave $51,170 through the British High Commission.

Non-Governmental Organizations

Australia Catholic Relief — gave $6,800.

Australia Red Cross — donated blankets, value not reported.

Caritas Germany, Fed. Rep. — gave $20,270.

Caritas Switzerland — gave $4,800.

TOTAL $618,247

Floods

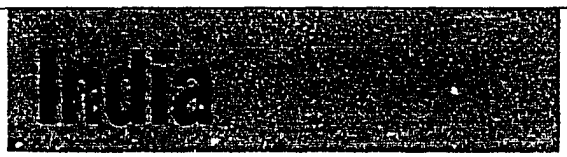
Date:
November 12, 1985

Location:
Coastal areas of Tamil Nadu State

No. Dead:
130

No. Affected:
500,000 in nearly 2,000 villages

Damage:
Extensive damage to homes, croplands, and irrigation systems; disruption of essential services



The Disaster

Storms lashed the southern Indian state of Tamil Nadu in early November, dumping over 100 mm of rain in coastal areas in a one-week period. Over half that amount fell between November 12 and 14 when the tropical depression responsible for the deluge was most intensive. Flash flooding and gale-force winds destroyed thousands of huts in the low-lying sections of Madras City and in the countryside, leaving at least 130 people dead and 400,000 homeless. Sixty lives were lost in a single incident when a bus was swept from a road near the rain-swollen Thondiyar River in Cuddalore.

Normal rail, road, and air traffic came to a virtual standstill in most parts of the state, and all shipping operations in Madras port were halted for four days. Power was cut in a wide area around Madras City. The agricultural sector was seriously affected by the flooding, as more than a dozen irrigation tanks were breached in Thanjavur, Chengalpattu, and South Arcot districts, and thousands of hectares of rice croplands were submerged.

Action Taken by the Government of India (GOI) and the Government of Tamil Nadu (GOTN)

Government troops, ships, and aircraft joined the search for survivors and helped evacuate the thousands of people stranded by rising flood waters. In the evacuation centers set up in schools and community buildings, flood victims received food packets and inoculations against cholera. Some 150,000 evacuees were still being sheltered in relief camps in Madras by November 19. The central government promised a quick allocation of the Rs. 91 crores (approximately $76 million) in emergency relief requested by the state government.

Assistance Provided by the United States Government

In view of the extensive damage caused by the flooding in Tamil Nadu, U.S. Ambassador John Dean determined on November 15 that a disaster existed in which U.S. assistance was appropriate and warranted. He exercised his disaster assistance authority to contribute $10,000 to the Prime Minister's National Relief Fund. In addition to the Ambassador's cash donation, Catholic Relief Services made available on a non-replacement basis 130,813 kg of Title II foods from regular program stocks to feed 73,150 disaster victims. The P.L. 480 commodities were valued at $48,640, inclusive of ocean freight.

TOTAL $58,640

Assistance Provided by U.S. Voluntary Agencies

CRS — diverted food commodities from P.L. 480 Title II stocks for emergency feeding. (See USG Assistance.)

Assistance Provided by the International Community

None reported

Floods

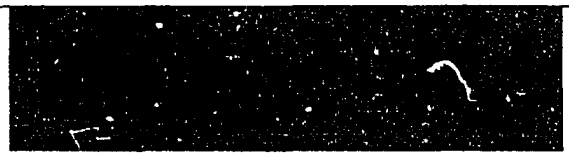
Date:
August 1986

Location:
Andhra Pradesh State

No. Dead:
187

No. Affected:
At least 245,000 people homeless

Damage:
By preliminary estimates, damage to the irrigation system alone was put at $560 million. In addition, more than 150,000 houses were damaged or destroyed; transportation links were severed; and crops on over one million ha were affected.



The Disaster

Torrential monsoon rains during the first three weeks in August caused severe flooding in the Godavari River in India's southeastern state of Andhra Pradesh. As many as 3,775 villages were affected by the floods, which were described as the worst in the area in 134 years. Several villages were completely swept away by the rising waters, and hundreds of others were marooned for up to two weeks. More than 150,000 houses were destroyed or damaged, leaving at least 245,000 people homeless. Road and rail lines were breached and vital services disrupted. Agriculture in the region was seriously affected by the loss of crops on over one million ha in 13 districts and the extensive damage to some 1,500 sources of irrigation.

Action Taken by the Government of India (GOI) and the Government of Andhra Pradesh (GOAP)

GOI military personnel, using helicopters and naval vessels, joined the search for survivors and assisted the relief effort. Hundreds of thousands of people were evacuated, and food was air dropped to stranded villagers. A disaster management center was established in the state capital of Hyderabad from which the situation was closely monitored. Relief camps were set up to provide temporary shelter for over 200,000 displaced persons.

Prime Minister Rajiv Gandhi surveyed the stricken area and announced a central government advance of $24 million for the care of flood victims in the camps, as well as the provision of 50,000 tons of rice, 5,000 tons of edible oil, and 10,000 kiloliters of kerosene. An additional $240,000 was released from the Prime Minister's Relief Fund.

The Andhra Pradesh Chief Minister announced that the National Remote Sensing Agency would be asked to take aerial photographs of the floodravaged areas to help plan long-term rehabilitation measures and the construction of monsoon shelters.

Teams from the Churches Auxiliary for Social Action (CASA) were quickly dispatched to the disaster area to assess needs and begin distribution of relief supplies. CASA provided 3,000 sets of relief items as well as medical assistance.

Assistance Provided by the United States Government

Based on reports of the devastation caused by flooding in Andhra Pradesh, U.S. Ambassador John Dean determined on August 26 that a disaster existed which warranted USG assistance. Exercising his disaster assistance authority, he contributed $25,000 to the Prime Minister's Relief Fund.

TOTAL $25,000

Assistance Provided by U.S. Voluntary Agencies

CWS — $58,000 to CASA for relief items.

World Relief — sent funds to assist the relief activities of the Brethren Mission in India, value not reported.

TOTAL $58,000

Assistance Provided by the International Community

WCC — provided $80,000 as an immediate response to the needs resulting from flooding in four states, including Andhra Pradesh. The WCC issued an appeal for $150,000 to recoup funds advanced.

TOTAL $80,000

Typhoon

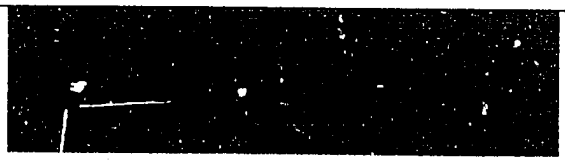
Date:
July 9-10, 1986

Location:
Northern and central Luzon
and Metro Manila

No. Dead:
106

No. Affected:
830,357

Damage:
- houses: 13,896 partially destroyed; 1,098 totally destroyed
- agriculture: 42,420 ha of rice land damaged; 12,279 MT rice production lost; 86,600 ha of corn land damaged; 31,732 MT corn production lost
- property and agriculture: $33,700,000



The Disaster

On July 9, 1986, Typhoon Peggy ("Gading" in the Philippines) ripped through northern Luzon. Peggy's center winds raged at 150 km/hour while crossing the provinces of Cagayan, Kalinga-Apayo, and Ilocos Norte. The typhoon finally pushed off into the South China Sea toward the Chinese coast after lingering in northern Luzon for 12 hours. The provinces of Pangasinan, Ilocos Norte, Ilocos Sur, La Union, and Bengued in Region I, and Cagayan and Kalinga-Apayo in Region II bore the brunt of the storm, although central Luzon and Metro Manila were also seriously affected. An estimated 129,020 ha of rice and corn cropland were damaged in northern, north-central, and central Luzon. Many rice fields were inundated by flood waters while the corn crop in the northern highlands was destroyed and could only be replaced by planting upland rice.

The intensification of the southwest monsoon rains, induced by the typhoon, brought flood waters to Manila. Of the total 106 dead, more than 20 were from Metro Manila; 15,000 families in the Manila area were affected.

Action Taken by the Government of the Philippines (GOP)

President Corazon Aquino declared a state of calamity in 18 provinces of northern and central Luzon and Metro Manila shortly after the typhoon struck. Relief operations were carried out by the Ministry of Social Services and Development (MSSD), Ministry of Health, Ministry of Food and Agriculture, and the Philippine National Red Cross (PNRC). During the first weekend after the storm hit, the National Disaster Coordinating Council and its local counterparts assessed the affected areas with support from the new armed forces. The GOP then identified emergency shelter assistance, repair of houses, rice, and rehabilitation of urban works as emergency needs. The PNRC served more than 61,000 families (about 358,000 people) while MSSD conducted a large emergency feeding program for 500,000 disaster victims in Luzon.

The Ministry of Health authorized the release of funds to provide medicine in the disaster areas and directed all hospitals to treat incoming victims. Meanwhile, the Citizens' Disaster Rehabilitation Center (CDRC) urged the public to contribute to the relief effort. The CDRC said food, medicine, and clothing were particularly needed and established drop stations to receive donations. The Philippine Air Force provided transport for many of the disaster relief supplies.

The value of the response of government relief agencies and civic and religious organizations amounted to approximately 7,045,735 pesos ($343,694). This consisted primarily of clothing, medicine and food (rice, canned goods, noodles, biscuits, sugar, coffee, and dried fish).

Assistance Provided by the U.S. Government

U.S. Chargé d'Affaires Kaplan determined on July 11, 1986, that the destruction wrought by Typhoon Peggy constituted a disaster. He donated the $25,000 Disaster Assistance Authority to the Philippine National Red Cross.

The Ministry of Health requested assistance to replace the medicine distributed in the stricken areas. OFDA therefore provided $101,000 for the local purchase of antibiotics, expectorants, and antipyretic/analgesics.

Other top priorities in the relief effort included food and seeds for replanting. Accordingly, OFDA provided $102,500 to USAID/Manila for the purchase of 1,670 cases of 5-ounce tins of sardines in tomato sauce ($36,500), 115 MT of rice ($36,000), and 1,500 cases of 6-ounce tins of condensed sweetened milk ($30,000). Another $10,000 was provided to MSSD for the transportation costs of these commodities. MSSD used the food as in-kind payment for food-for-work projects involving the repair of community facilities and damaged houses. Close to 20,000 people participated in this project.

OFDA also gave a $17,000 grant to CRS for a relief project to provide locally procured food (rice, canned sardines, and dried fish), medicine, seeds (rice, corn, and vegetable), and transport. This project was implemented through the Catholic dioceses in the less accessible mountainous areas of five provinces (Kalinga-Apayo, Abra, Bengued, Mountain Province, and Ifugao) where GOP delivery systems are least developed. The program reached 5,363 families.

Finally, OFDA provided $100,000 to the GOP Ministry of Food and Agriculture (MFA) for replacement seeds. MFA used these funds to buy 166 MT of rice seed and 23 MT of corn seed for its program to assist small farmers to replant crops. This program provided a 50 percent subsidy of the market price of the seeds enabling 3,862 severely affected farmers to buy enough seed for two hectares of land.

The U.S. military in the Philippines also provided assistance. The Office of Civic Action of Clark Air Force Base spent $10,000 on rice and clothing which it distributed in areas around the base and Camp John Hay in Baguio. Clark AFB also provided medical help in affected villages. Subic Naval Base collecteed $44,000 worth of supplies and turned them over to CRS for distribution. The U.S. Navy also donated 24 MT of food (brown rice, pinto beans, tomato sauce, nutrilite drink mix, and nutri-snacks), eight MT of pharmaceuticals, and three MT of clothing, all valued at $147,500.

Total OFDA	$355,500
Total DOD	$201,500
TOTAL	**$557,000**

Assistance Provided by U.S. Voluntary Agencies

CRS — provided food and clothing, valued at $35,000, and implemented a relief project supported by USAID (see USG assistance).

TOTAL $35,000

Assistance Provided by the International Community

Germany, Fed. Rep. — donated $43,478 for food and rehabilitation of schools in Bengued Province.

Japan — provided 300,000 rations of hard biscuits, worth $340,000, to relieve hunger on Negros Island; transport of the biscuits was $100,000; also contributed $100,000 through UNICEF for additional food and $100,000 to the Ministry of Public Works and Highways for the repair of bridges and roads.

Japan Red Cross — donated clothing, value not reported.

Soviet Union Red Cross — provided 34 bales of blankets and 36 cases of medicine, value not reported.

TOTAL $683,478

Typhoon

Date:
August 17-August 27, 1986

Location:
Luzon

No. Dead:
23

No. Affected:
482,700 people
(96,540 families)

Damage:
699 houses partially damaged, 473 houses totally destroyed; $13,150,000 damage to property.

The Disaster

The tropical weather disturbance named Miding hovered in the Pacific waters northwest of Luzon for two weeks in late August, alternately gaining and losing strength. Miding first entered Philippine waters west of Manila on August 17, but dissipated the following day. On August 24 Miding returned, moving away two days later. The storm entered Philippine's waters a third time on August 27, this time gaining strength and attaining wind speeds of 150 km per hour. It followed a very erratic course as it lingered over the Pacific before finally dissipating more than a week later. Although Miding did not actually hit the Philippines, it affected the weather system and brought torrential rains which flooded Luzon, including Metro Manila.

As much as 70% of Manila was flooded, some areas inundated by nearly two meters of water. In places outside the metropolitan area, the floods were reported to be even higher. In several villages people stranded by the rising water had to be rescued by helicopter.

The heavy rains and the floods that followed killed 23 people and affected 96,540 families. In the stricken area, 473 houses were destroyed and 699 were damaged. Nearly 50,000 people had to be evacuated. Total estimated damage surpassed $13 million, including $7.5 million to crops, $4.6 million to infrastructure, and the remainder to livestock, fish ponds, and private property.

Action Taken by the Government of the Philippines (GOP)

The Government of the Philippines immediately took action to respond to the disaster. President Corazon Aquino declared a state of calamity in Luzon including Metro Manila, and the Ministry of Social Services and Development (MSSD) and NGOs were mobilized. The President also convened ministers of social services, health, highways, education, budget as well as local officials to discuss ways of providing relief to the stricken areas. MSSD provided $8,084 in food, clothing, and cash and the Ministry of Health (MOH) supplied $49,733 worth of medicine to the relief effort.

Emergency rescue operations were conducted through a joint effort of the New Armed Forces of the Philippines and the Ministry of Public Works and Highways. Forty-seven evacuation centers were established in schools and other government buildings on higher ground. Philippine Air Force helicopters were called in to rescue people isolated by flood waters in several villages.

Non-governmental agencies in the Philippines played an important role in the disaster response. Relief operations were conducted by local disaster coordinating councils composed of members of MSSD, Philippines National Red Cross (PNRC), MOH, local governments, and private relief agencies. The PNRC supplied $26,873 in relief food and medicine. Civic and religious organizations and private voluntary agencies raised funds and solicited food and clothing donations totaling $4,959. Local governments contributed an additional $4,214 to the relief activities.

Assistance Provided by the United States Government

U.S. Ambassador Stephen Bosworth determined that the disaster warranted USG assistance. On September 3, he declared a disaster and presented a check for $25,000 to President Aquino for immediate relief activities.

TOTAL $25,000

Assistance Provided by the International Community

Unspecified donations from international organizations and foreign governments totaled $9,507.

TOTAL $9,507

Cyclone

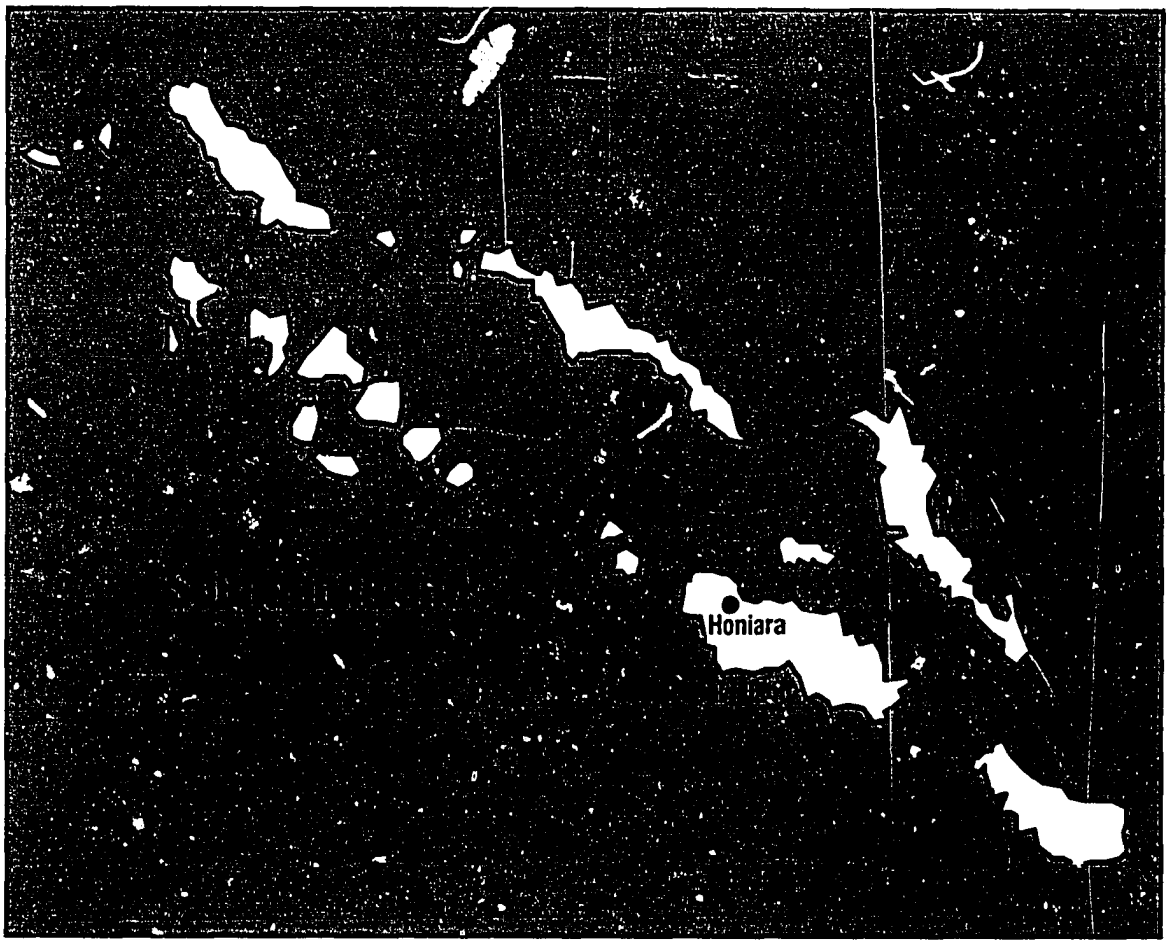
Date:
May 19, 1986

Location:
Sikaina, Malaita, Guadalcanal, Ulawa, Makira, Rennell, and Bellona Islands

No. Dead:
101

No. Affected:
90,000 without food; at least 60,000 homeless

Damage:
Severe damage to houses, public buildings, commercial and garden agriculture; water sources contaminated and sewage systems disrupted; bridges washed out, airstrips buried and ports closed; telephone and electrical lines downed and communications disrupted.



The Disaster

On May 18, Cyclone Namu swept through the southeastern Solomon Islands, causing more fatalities and damage than any cyclone on record for these islands. Crossing from the northeast to the southwest, the cyclone dumped torrents of rain and caused heavy wind damage as it passed. Namu first struck the small island of Sikaina, wrecking t[illegible]nal houses constructed of palm fr[illegible], flooding the island with water, and contamin[illegible]ing fresh water wells so that the entire isl[illegible]d was left without potable water. The cyclone then moved southwest across the southern part of Malaita, the most populated island. Here the cyclone remained virtually stationary for five hours. Waves damaged coastlines and heavy winds tore off roofs and defoliated the hills in the southern, western, and central parts of the island.

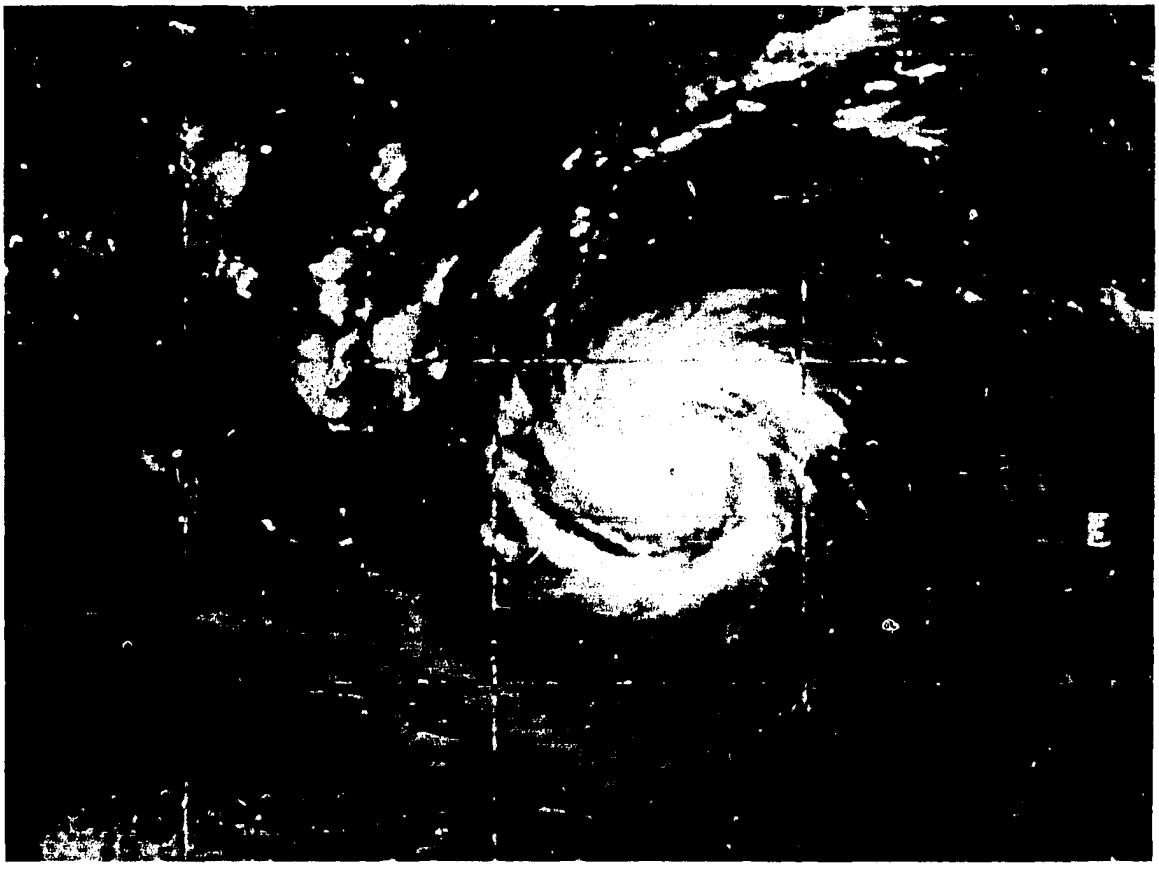
By mid-morning on May 19, Namu had reached the eastern end of Guadalcanal Island and the western part of Makira Island. On Guadalcanal, the coincidence of hurricane force winds and massive flooding destroyed forests, gardens, and commercial agriculture. Rivers swollen to several t[illegible]mes their normal size carried tons of mud and timber. The logs destroyed bridges, then jammed and created water impoundments. The large volume of water and log obstructions caused rivers to overflow their banks and change course. Thou-

sands were left homeless and without food as their houses and a large portion of the commercial and garden crops were buried in mud and timber. The flat Guadalcanal Plains, the center of the country's commercial agricultural development, were particularly affected. In the mountainous central area, mudslides wiped out entire villages. In the capital city of Honiara, winds and falling trees knocked out both power and telephone lines. Water supplies were cut when sections of the water pipes were swept away.

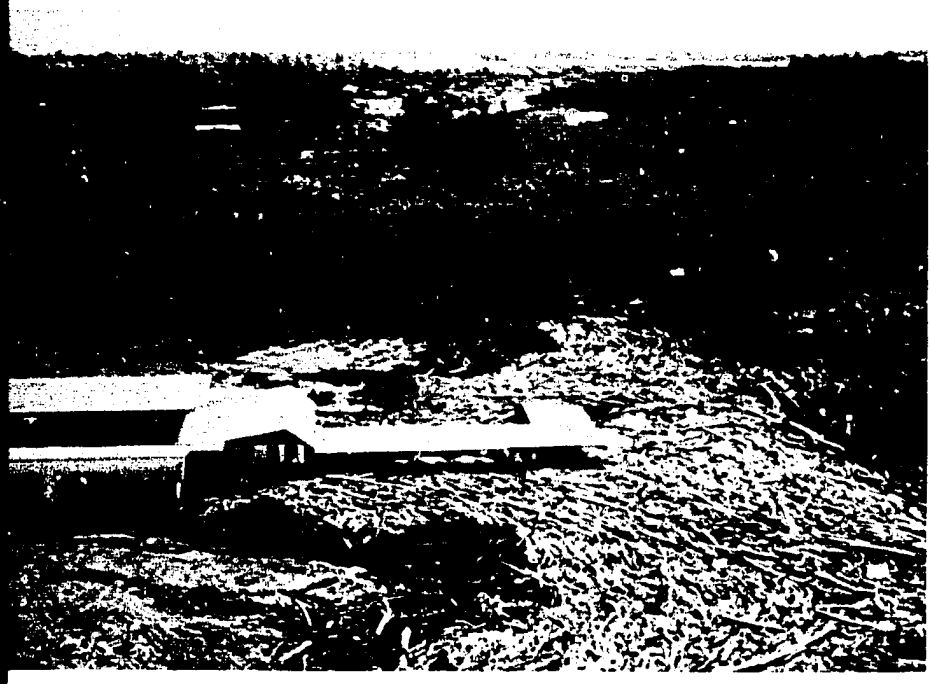
By May 20, Namu had moved south of Guadalcanal and passed just west of Rennell and Bellona Islands. Both islands felt the effects of the cyclone, although the damage to Bellona was more serious. Namu then left the Solomon Islands waters, losing intensity as it moved south.

The number of casualties from the cyclone topped 100; at least 60,000 people were left homeless; and 90,000 people were without food. Much of the rice crop was totally destroyed and taro, yams, and other foods were damaged in many locations. Contamination of water sources created a critical shortage of potable water, especially in outlying areas. Sewage disposal in heavily populated areas became a potential health hazard. Moreover, pools of stagnant water caused by heavy rains and floods created ideal mosquito breeding conditions. An increase in mosquitos presented the possibility of an outbreak of malaria or dengue fever.

International and inter-island communications were disrupted making it impossible to know the full extent of destruction. Radio and phone links between islands were inoperable. Henderson Airport in Honiara and many other provincial airports were closed because of flooding. Honiara's port remained open, but other minor ports were destroyed. Logs constituted a significant navigation hazard in rivers and coastal areas. International Telex Communication was restored within a few days, but it took much longer to reinstitute communication among the islands.



This May 20 satellite picture captures Cyclone Namu as it is leaving Solomon Island waters and an unnamed cyclone north of the equator.



Action Taken by the Government of the Solomon Islands (SIG) and Non-Governmental Organizations

On May 20, just after the cyclone had passed over the Solomon Islands, Prime Minister Kenilorea declared a disaster and requested assistance to meet the urgent need for cash to purchase relief supplies locally. Food and emergency shelter for the homeless were identified as immediate short-term needs for the islands of Malaita and Guadalcanal. On May 23, the SIG formally requested UNDRO to launch an international appeal for assistance.

The Solomon Islands Disaster Council (SIDC) coordinated all relief activities. The SIG experienced extreme difficulty in assessing the total picture because blocked roads, smashed bridges, and floodwaters restricted access to stricken areas. Broken communications between islands also interfered with evaluation. Attempts to assess the number of houses affected were soon abandoned and villages were counted instead. In July, a more thorough damage survey was undertaken by the SIG with the assistance of communication teams from the U.S. and the United Kingdom.

Australian helicopters, small private helicopters, and a local light plane fleet made relief food drops and conducted medical evacuations. These flights operated out of Henderson Airport and initially concentrated on the Guadalcanal Plains area. Destruction and damage to major bridges over rivers in the Guadalcanal Plains hampered ground movement into and out of this badly affected area. Eventually fuel supply dumps were established in outlying areas and the helicopter relief operation began to focus on southern Malaita and Makira Islands.

The SIDC used emergency funds to purchase food and equipment locally. The Council also purchased tinned fish and 2,000-gallon water tanks in Papua New Guinea and requested U.S. assistance to airlift the equipment and two technicians to the Solomon Islands. The Ministry of Health began a spraying program to prevent disease outbreaks from mosquitos and other insects. In areas where road links were cut by downed bridges, sprayers were transported by boat.

Local groups and citizens also contributed to the disaster relief effort. The Solomon Islands Red Cross (SIRC) distributed its entire stock of relief items, including blankets, cooking utensils, and 500 rolls of fabric for lavalavas. Solomon-Taiyo, a SI-Japan joint venture, contributed 4,500 MT of blue tuna. A Solomon Islands Broadcasting Corporation radio appeal collected over $61,000. People in unaffected areas also contributed food and clothing.

The Development Services Exchange (DSE), a coordinating body of NGOs working in the Solomon Islands, was authorized by the SIG to negotiate and accept contributions and identify agencies to conduct rehabilitation programs. The focus of DSE activities was middle to longer term programs to restore housing and gardens.

Assistance Provided by the United States Government

On May 20, U.S. Ambassador Paul E. Gardner, operating from the U.S. Embassy in Papua New Guinea (PNG), declared that a disaster existed in the Solomon Islands. Excercising his Ambassador's Authority, he donated $25,000 to purchase food locally.

In response to an immediate request from the Solomon Islands Disaster Council, OFDA supplied 345 rolls of plastic sheeting from its Guam stockpile to be used for temporary shel-

ter. DOD transported the materials in two C-130s to Henderson Field, which had previously been closed to traffic due to flood damage. Later an additional shipment of 153 rolls was sent, making a total of 498 rolls contributed. OFDA dispatched a disaster specialist from Washington who accompanied the first load of plastic sheeting arriving from Guam. A representative from the South Pacific Regional Development Office (SPRDO) in Suva arrived with the second aircraft. These specialists provided field support, conducted aerial damage assessment, and coordinated relief activities with the SIDC, PVOs, and the PNG U.S. Embassy Representative in the Solomon Islands. OFDA also loaned two water purification units capable of purifying 2,000 gallons of water per hour and donated eight 3,000-gallon capacity water tanks. The equipment, also from the Guam stockpile, was transported along with the second shipment of plastic sheeting aboard a C-130. Two technicians were sent to service the equipment and train host country personnel in their operation. In addition, AID's Water and Sanitation for Health Project (WASH) sent an engineer to assess damage to water supply systems.

Distribution of OFDA plastic sheeting

OFDA also supplied equipment requested by the SIG to reduce mosquito and fly proliferation in order to prevent a possible outbreak of malaria or dengue fever. Four vehicle-mounted fogging machines were purchased in the U.S. and airlifted to the Solomon Islands. OFDA made a cash donation of $5,500 to the government for local purchase of insecticide, batteries, and insecticide containers for the machines.

AID's Office of Food for Peace allocated 900 MT of food to meet emergency needs; 300 MT of P.L. 480 rice were taken from in-country stockpiles and another 600 MT of rice were shipped to help ease the food shortage.

OFDA requested DOD assistance to provide communications equipment needed by the SIG in their survey operations. DOD supplied 30 portable two-way radios, spare parts, and batteries from Okinawa and airlifted them to Guadalcanal. Six Marine communications experts were deployed with the equipment, which was used to support the Ministry of Agriculture and Lands' systematic survey of cyclone damage. The Marines trained SI police in the operation of the radios. Teams were formed and deployed to the field by helicopter where they assessed conditions and radioed information back to a central headquarters.

Peace Corps Volunteers became involved with helicopter food distribution, communications, and relief in the Honiara area. Volunteers also assisted with training as part of the USAID housing rehabilitation project. The Peace Corps Director made his headquarters available as a base of operations for the OFDA disaster specialist and the SPRDO representative. This proved invaluable particularly concerning communications with the U.S. Ambassador in PNG and OFDA in AID/W. Clerical services were also provided and the entire staff was always available to assist.

The damage to housing was especially disruptive because locally available sago palm, which is the basic construction material used to build traditional houses, was heavily damaged. At the same time, a tremendous amount of timber was swept out of the hills by flood water and deposited on beaches and river banks. USAID/SPRDO in Fiji, with OFDA input, initiated a grant program with International Human Assistance Programs (IHAP) to use the timber for housing rehabilitation. OFDA contributed five moveable sawmills purchased from Papua New

American technician setting up water purification units.

Guinea, 24 tents to accommodate rehabilitation teams, and technical consultants from INTERTECT. USAID/Fiji allocated a total of $200,000 in both FY 86 and FY 87 for this project. The funds were to be distributed by IHAP to support costs for local procurement, administration, and training.

Just after the disaster, the SIG requested USG assistance in obtaining satellite images of the Solomons in order to assess changes in river courses and measure the size and location of landslides. Despite several attempts in May and June, it was not until August that the cloud cover cleared sufficiently to allow a readable satellite picture. The resulting images, prepared by SPOT-Image Corporation, were transferred to the SIG via the U.S. Embassy in Papua New Guinea.

Summary of USG Assistance

Ambassador's Authority used to purchase food locally $25,000

498 rolls of plastic sheeting from OFDA stockpiles in Guam $155,442

8 3,000-gallon water tanks from OFDA stock in Guam (FY 87) $19,496

DOD C-130 airlift of 2 loads of plastic sheeting, water purification units, and water storage tanks from Guam; airlift of SIG-purchased tinned meat and PNG technicians from Port Moresby $75,000

2 U.S. technicians to train personnel in water purification system operation $31,292

4 vehicle-mounted fogging machines for mosquito/fly control and transport .. $22,354

Local procurement of batteries, insecticide, and containers for fogging machines $5,500

30 radios, spare parts, and batteries from Okinawa ($90,000) and temporary assignment of 6 DOD communications personnel ($20,000) and transport ($65,000) $175,000

24 tents from OFDA stockpile in Guam (to be replaced in FY 87) $10,080

5 sawmills from Papua New Guinea and shipment to Honiara $50,000

Contract with INTERTECT for technical assistance on housing rehabilitation project $22,000

Satellite imagery $2,400

Travel and administrative expenses of OFDA disaster relief officer (operating expenses) $3,445

900 MT of rice from Food for Peace ($270,000) and transport ($130,500) $400,500

Services and expenses of AID/WASH engineer $7,000

USAID funds for support costs of housing rehabilitation project; funds dispersed through IHAP ($100,000 FY 86, $100,000 FY 87) $200,000

Total OFDA FY 86 ..... $567,433
Total FFP FY 86 ..... $400,500
Total Other USG FY 86 ..... $107,000

Total FY 86 ..... $1,074,933

Total OFDA FY 87 ..... $29,576
Total Other USG FY 87 ..... $100,000

Total FY 87 ..... $129,576

TOTAL $1,204,509

USAID disaster specialist and medical personnel visit a disaster site.

Assistance Provided by U.S. Voluntary Agencies

ADRA — sent $17,500 in cash in addition to food, clothing, blankets, and diapers.

ANRC — donated $5,000.

CRS — gave $35,400 for the purchase of 4 boats/outboards, 200 sets of garden tools, 14 chainsaws, and vines and seedlings. An additional $10,000 grant was given to Honiara Diocese Project Committee.

CWS — contributed $5,000 from the Executive Director's emergency fund to the Solomon Islands Christian Association.

Foundation For the Peoples of the South Pacific (FSP) — assisted the SIG in coordination of disaster relief operations, established a committee of all NGOs, dispatched a nine-person volunteer medical team and supplies, and coordinated food aid.

SCF/US — supplied a cash grant of $5,000 in support of an Australian medical team.

World Vision International, South Pacific Regional Office — donated $70,000 for relief and recovery, of which $10,000 was allocated for food, an equivalent amount for chain saws and sawmills, and the remainder for seed, reconstruction of houses and schools, and support of skilled craftsmen for three months to assist in reconstruction.

TOTAL $147,900

Assistance Provided by the International Community

International Organizations

EC — provided $97,000 in cash for immediate relief items and $396,430 for local purchase of food.

UNDP — supplied an emergency grant of $50,000.

UNDRO — sent a field delegate on May 25 to work with SIDC and launched an international appeal.

UNICEF — contributed $25,000.

WFP — donated 1,000 MT of rice ($420,000), 108 MT of tinned fish ($123,000), 3 MT of tea, 3 MT of sugar, and 15 of MT biscuits (value not reported); and dispatched a staff member to assist in food distribution.

WHO — donated $7,000.

Governments

Australia — supplied and transported 2 helicopters, 30 tents, 1,000 small and 100 large tarpaulins, first aid kits, 2,000 water containers, 40 kg of water purification tablets, and food, all valued at $1,086,956. A six-person AODRO medical team ($100,000) and radio team were dispatched. The Australians also brought in Bailey Bridging to span rivers where old bridges had been destroyed.

China — contributed $55,333.

Germany, Fed. Rep. — donated $36,000.

India — sent $41,000 worth of medical supplies.

Japan — donated $100,000 cash grant and dispatched two medical teams, the first on May 24, the second on May 29. $103,681 worth of antibiotics, vitamins, medical equipment, and water purifiers accompanied the teams. An additional $100,000 to purchase and transport tinned fish was donated through WFP.

Korea, Rep. of — gave $21,622.

Nauru — contributed $29,203.

New Zealand — provided tents, food, helicopters, electrical equipment, and medical kits, all valued at $1,069,833; sent an assessment team of engineers and a four-person medical team.

Papua New Guinea — donated $32,400.

Thailand — gave $27,333.

United Kingdom — gave $120,000 in cash and sent a six-person communications team and equipment.

Non-Governmental Organizations

ADRA (Australia) — contributed food and cooking sets, valued at $111,111.

Australia Agricultural Consultants — donated 1,160 kg seeds, value not reported.

Australia Red Cross — contributed $8,000.

Australian Catholic Relief — gave $6,800 in cash.

Caritas Germany, Fed. Rep. — gave $20,275.

Caritas Switzerland — gave $4,800.

China, People's Rep., Red Cross — contributed $15,000.

Kirbati Red Cross — gave $360.

Lions (Australia) — supplied medicine, food, and shelter worth $14,472.

Marist Brothers (Australia) — donated 3 MT of food, value not reported.

Miseroir (Germany) — gave $200,000 to the Foundation for the Peoples of the South Pacific, of which $90,000 was for the purchase and operation of a sawmill.

Mrs. Saunders Group, Brisbane (Australia) — donated 50-60 cases of apples, cooking utensils, and clothing, value not reported.

National Provident Fund — gave $10,000.

New Caledonia — donated $1,439.

New Zealand Labour Trust — contributed $11,667.

New Zealand Red Cross — gave $2,825.

Papua New Guinea Red Cross — supplied $6,970.

PNG Women's WANTOK Association, Canberra (Australia) — sent 1 bail of clothing, value not reported.

St. Vincent de Paul (Australia) — sent 20 bails clothing, and $2,171 worth of corrugated iron.

Shell — donated $3,333 in cash.

Sweden Red Cross — contributed $6,850.

Switzerland Red Cross — contributed $5,263.

Tuvalu Red Cross — gave $1,333.

Watertower Society (Australia) — sent 45 MT of food, value not reported.

Western Samoa Red Cross — donated $1,333.

United Kingdom Red Cross — contributed $7,450.

TOTAL $4,483,252

Floods

Date:
January 1986 (Floods)
April 20, 1986 (Dam burst)

Location:
Eastern and central Sri Lanka

No. Dead:
43 (Floods)
125 (Dam burst)

No. Affected:
529,000 (Floods)
25,000 (Dam burst)

Damage:
Extensive damage to homes and paddy croplands in both disasters; transportation, power, and telecommunications infrastructure damaged and water supply for cultivation cut off by dam burst.

The Disaster

Heavy and continuous rains in early January caused severe flooding in the eastern and central regions of Sri Lanka. Thousands of families were evacuated from threatened areas in the most seriously affected districts of Ampari, Batticaloa, and Pollonnaruwa. Earthslides posed an additional hazard in Badulla and Nuwara Eliya. With the rice crop ready for harvesting, significant paddy losses were expected.

In a second and apparently related disaster, the bund of the Kantalai reservoir, located 45 km southwest of Trincomalee, burst on the morning of April 20, inundating a vast area. At least 68 people died and 57 were missing as 35 villages were flooded. Some 8,000 people sought temporary refuge in public buildings; however, over three times that number were affected by the loss of the water tank on which they were dependent for cultivation. The government estimated that it would take at least six months to repair the breach and provide irrigation again. Moreover, most of the recently harvested paddy crop was washed away, leaving the population with no immediate means of subsistence. Rail, road, telecommunications, and power lines were also cut in the affected area.

Action Taken by the Government of Sri Lanka (GSL) and Non-Governmental Organizations

Temples, schools, and other public buildings were opened to the victims of the January flooding as places of temporary refuge. At the direction of the GSL, government agents distributed cooked meals and dried rations to the affected people. The value of government relief assistance was estimated at $934,000. Over 12,000 families were identified by the government as requiring resettlement or rehabilitation assistance. The Ministry of Social Services appealed to the WFP for help with a rehabilitation project.

Using boats and helicopters, the police and armed forces rescued stranded people after the Kantalai reservoir disaster. The Sri Lanka Red Cross (SLRC) sent a first aid team to the disaster site with medicines and other relief supplies. The SLRC also appealed to LRCS for milk powder and sleeping bags.

CEDEC, an indigenous PVO, agreed to construct 75 houses, value not reported, in the area affected by the bursting of the irrigation tank.

Assistance Provided by the United States Government

U.S. Ambassador James W. Spain determined on January 16 that a disaster situation existed in Sri Lanka as a result of severe flooding. He exercised his Disaster Assistance Authority to commit $25,000 to the relief effort.

At the request of the GSL, the USG also contributed 750 MT of milk powder for distribution among 25,000 people affected by the breach of the Kantalai reservoir. The Mission Disaster Relief Officer, with the assistance of other Mission officials, monitored the program which was to be administered by the GSL Department of Social Services. The milk powder, provided under the Dairy Products Donation Program (Section 416) of Food for Peace, was valued at about $619,000, including transport costs.

Total OFDA	$25,000
Total Food for Peace	$619,000
TOTAL	**$644,000**

Assistance Provided by U.S. Voluntary Agencies

SCF/U.S. pledged $5,000 for assistance to children affected by the Kantalai disaster.

TOTAL $5,000

Assistance Provided by the International Community

International Organizations

LRCS — launched an appeal on February 4, 1986, for food, household items, medicine, and transport vehicles to assist 5,000 victims of the January flooding.

UNICEF — provided medicine in response to needs identified by the GSL's Ministry of Health.

Ministry of Health.

World Bank — agreed to meet 60% of the cost of reconstruction of the reservoir bund, as the tank had already been earmarked for rehabilitation in an IBRD project.

Governments

Japan — gave $100,000 to help repair the reservoir, roads, and railways.

United Kingdom — donated approximately $160,000 for relief activities and sent an expert to investigate the cause of the breach.

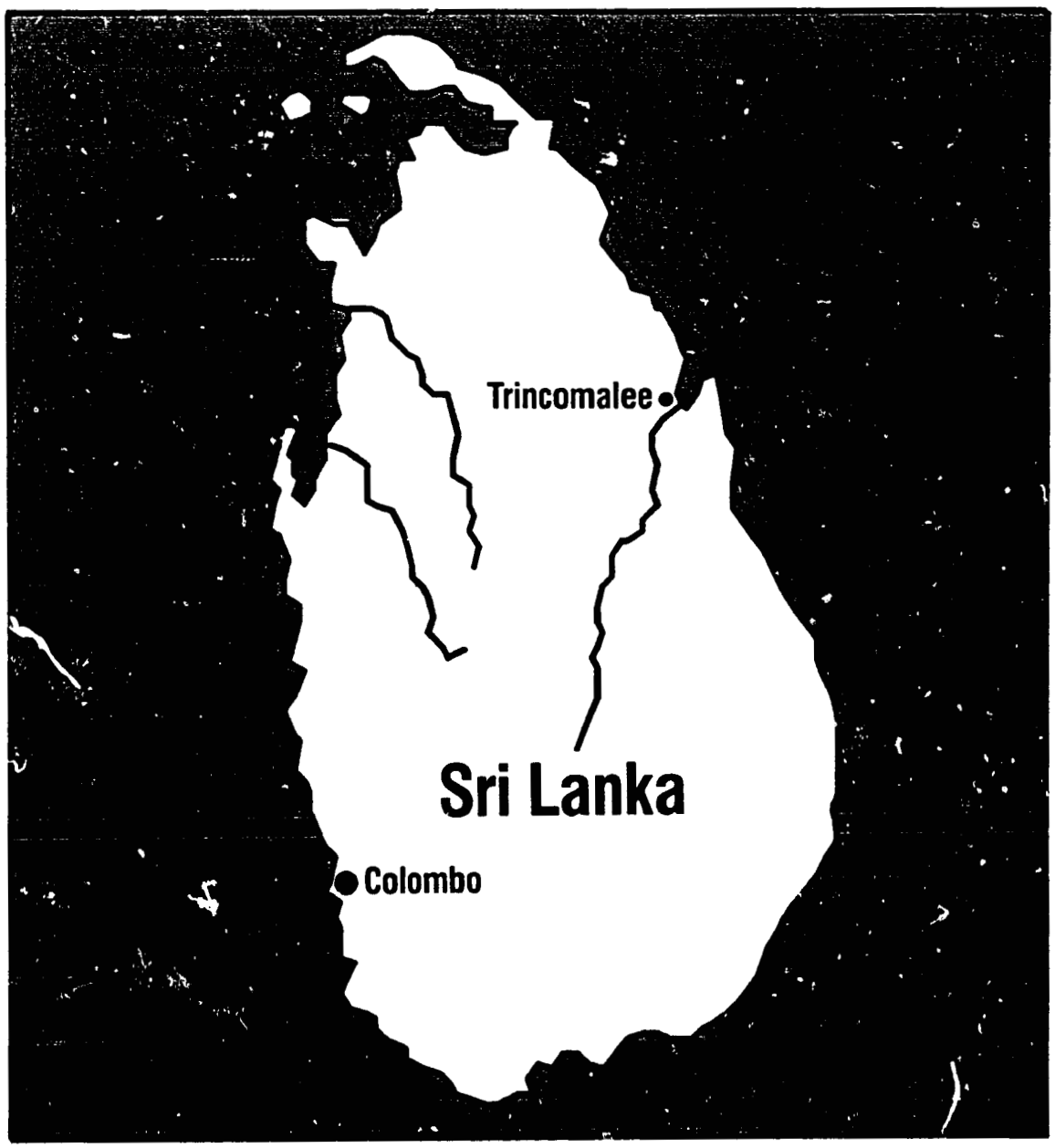
Non-Governmental Organizations

Norway Red Cross — gave $127,000 to the SLRC for the construction of 300 houses after the Kantalai disaster.

Redd Barna — provided cash for the construction of 75 houses, value not reported.

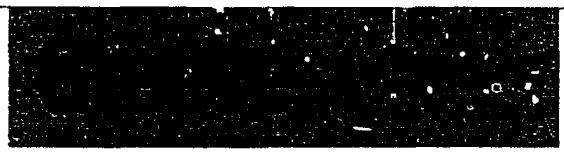
SCF/U.K. — donated five pumps for existing wells, value not reported.

TOTAL $387,000



EUROPE

Earthquake



Date:
September 13 and 15, 1986

Location:
Southwestern Peloponnesus: town of Kalamata

No. Dead:
20

No. Affected:
45,000

Damage:
246 houses and three churches collapsed; 462 houses rendered uninhabitable; 3,176 houses seriously damaged

The Disaster

On the evening of September 13, as townspeople were sitting down to dinner, a moderate magnitude, shallow earthquake rocked Kalamata and surrounding villages in Greece's Southern Peloponnesus. The quake occurred approximately 240 km southwest of Athens with its epicenter in the Bay of Messinia. The National Observatory in Athens registered the quake as a 6.2 magnitude event; other international seismic observers reported the magnitude at 5.8 on the Richter scale. Buildings in villages around the bay suffered serious damage while the town of Kalamata, population 45,000, was 70 percent damaged. The nearby village of Eleochori was almost completely leveled. Two days later, on September 15, the entire area was struck by a large aftershock registering between 4.6 and 5.4 on the Richter scale. The effect of the second quake was to further damage buildings weakened by the initial event. Fortunately, no further loss of life occurred.

Collapsed five-story apartment building

Action Taken by the Government of Greece (GOG)

The GOG response to the earthquake in the Kalamata area was rapid: Prime Minister Papandreou immediately declared a state of emergency in the affected region and initiated rescue and airlift operations, deploying medical supplies and personnel from Athens to Kalamata. President Sartzetakis, the Deputy Prime Minister, and two other ministers flew to Kalamata to coordinate the rescue operations and an interministerial group was established to coordinate overall assistance. Within hours of the quake, rescue teams were mobilized to extract survivors from beneath collapsed buildings. Twenty people were killed in the quake and 300 people suffered injuries requiring treatment (fractures, concussions, head wounds and deep cuts from glass).

Although the GOG did not appeal for international assistance, contributions of clothing, blankets, and temporary shelter were welcomed. In addition, the GOG established an account at the National Bank of Greece for voluntary cash contributions.

The Ministry of Health and Welfare provided 1,600 tents which the Army erected by Sunday night. Two Greek naval vessels carrying emergency supplies arrived at Kalamata within 24 hours of the quake. A team of 300 engineers was deployed throughout the city to assess damages and identify those buildings which were uninhabitable.

Four Greek naval ships which berthed in Kalamata were requisitioned for emergency accommodation. The owner of a luxury cruiser made his ship available as a shelter for approximately 1,000 elderly, and the newly commissioned Kalamata-Crete ferry was also employed for shelter for the homeless.

Field kitchens were set up on Sunday to serve hot food to the homeless. After two weeks, the system of providing cooked food was scaled down and replaced by a food distribution system for those with their own cooking facilities. Food distribution continued for six weeks after the quakes.

Assistance Provided by the United States Government

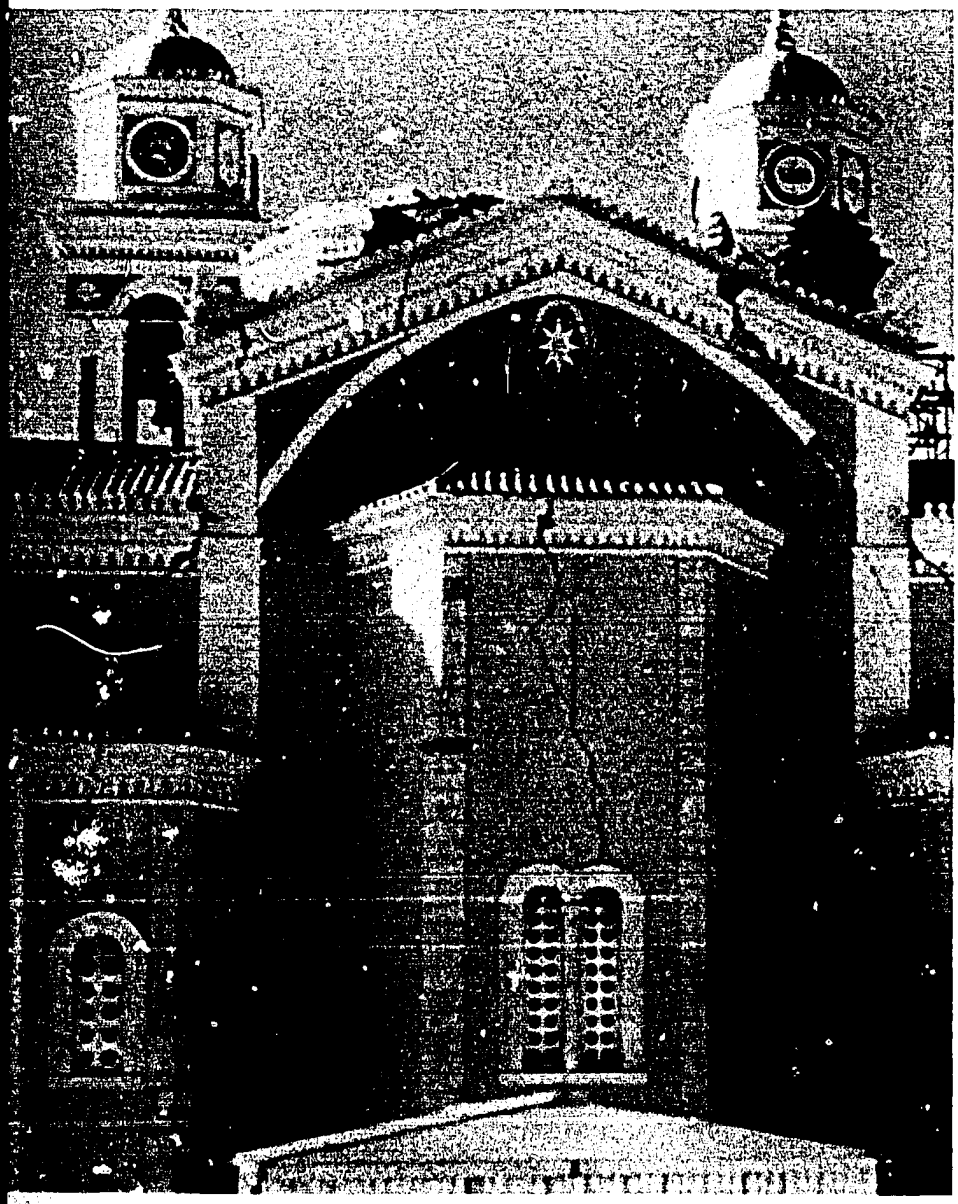
Upon learning of the quake, U.S. Ambassador Robert Keeley contacted the GOG to offer U.S.

assistance if required. On September 16, after the second quake, Ambassador Keeley declared the situation to be a disaster warranting USG assistance and contributed $25,000 to the Emergency Relief Fund established by the GOG at the National Bank of Greece.

In addition, OFDA assembled and deployed a technical assistance team composed of two architects and a civil engineer. Team members had extensive experience in all aspects of repair and anti-seismic strengthening of earthen and stone masonry housing. The team worked with the Greek anti-seismic planning and construction organization to define repair and reconstruction options for low- and middle-income housing in the affected area. Total cost of the three-person team was $22,527.

Total FY 1986	$25,000
Total FY 1987	$22,527
TOTAL	**$47,527**

Late 19th century cathedral



Assistance Provided by U.S. Voluntary Agencies

American Hellenic Educational Progressive Association — established a special fund for the Kalamata Earthquake Relief and received contributions of $1,000,000.

CWS — issued an appeal for $30,000 and contributed $5,000 through the WCC.

Greek Orthodox Archdiocese — established a Kalamata Earthquake Victim fund with an initial contribution of $100,000 from the Archdiocese.

Special Relief Fund for Greeks Abroad — opened an account for contribution at the central branch of the National Bank of Greece.

TOTAL $1,105,000

Assistance Provided by the International Community

International Organizations

WCC — launched an appeal for $100,000 for mobile clinics and relief materials.

LRCS — dispatched a member of the emergency standby team from the Spanish Red Cross and distributed tents and blankets from its own stocks as well as from the national societies of Bulgaria, Czechoslovakia, Greece, and Yugoslavia; value not reported.

Governments

France — sent a rescue team with specialized search equipment and trained dogs; value not reported.

Germany, Fed. Rep. of — sent a 14-person technical disaster team with relief material and equipment; all valued at $146,341 including transport.

TOTAL $146,341

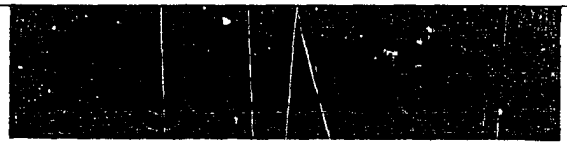
Floods

Date:
February 18-20, 1986

Location:
Montenegro and southern Serbia

No. Dead:
None

No. Affected:
1,000+



The Disaster

Heavy rains combined with accumulated snowfall to cause severe flooding in the mountainous republic of Montenegro. The waters later spilled over to the southern part of the Serbian republic. The worst damage occurred in the old Montenegrin capital of Cetinje, a city of 25,000 people. Two-thirds of the town was flooded, in some places as deep as 4.5 m. Press reports stated that 900 Cetinje families were evacuated and that more than 1,000 homes and several of the city's factories had been badly damaged.

The rains and melted snow caused numerous landslides in this rugged, mountainous region. The rail link between Belgrade and the Montenegrin port of Bar on the Adriatic coast was cut by a landslide, which covered more than 400 m of the track. Electric and telephone service to many towns and villages was interrupted. Furthermore, many highways were cut by slides, hampering efforts to evacuate flooded regions and restore communication links. Montenegrin officials described the disaster as the worst since the 1979 earthquake which claimed 121 lives.

In southern Serbia, the flooding affected towns along the Ibar, Timok, and Western and Southern Morava rivers. A regional health center and telephone lines were damaged in Pozegar, while in the village of Bresje 30 houses were damaged and livestock fodder was destroyed. The town of Rekovac was left without water and electricity, and the Belgrade-Nis highway was damaged.

Action Taken by the Government of Yugoslavia

Local officials coordinated the relief effort. The swift action and effective organization of relief workers earned the praise of city officials. The Yugoslav army and the police were also called in to assist with evacuation and relief efforts. Most of the infrastructure of the town of Cetinje remained intact. Although schools closed during the floods, they soon reopened, and the local hospital continued to operate throughout the disaster.

Assistance Provided by the United States Government

Because of the severe damage caused by the flooding, U.S. Ambassador John D. Scanlan declared a disaster on February 21, 1986, and donated $25,000 to the town of Cetinje. The Ambassador presented the Mayor of Cetinje with a check for 7,722,503 dinars made out to the city's disaster relief fund.

TOTAL	**$25,000**

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

None reported

LATIN AMERICA AND THE CARIBBEAN

Floods

Date:
October-November 1985

Location:
Province of Buenos Aires

No. Dead:
12

No. Affected:
150,000

No. Homeless:
56,000

Damage:
6,400,000 ha under water; over 300,000 MT of cotton and sorghum lost; approximately 150,000 livestock drowned. Total agricultural losses estimated at $1.3 billion.

The Disaster

Incessant rains starting in late-October and lasting until mid-November caused widespread flooding in Buenos Aires Province. Flooding occurred along the Salado, Reconquista, Matanza, and Lujan river basins, affecting approximately 100 towns in the northern, central, and western districts of the province. While the towns of Dolores and Lago Epecuen were completely inundated, the situation in the capital city of Buenos Aires remained manageable. Five provincial highways were cut; almost 34,000 houses were damaged or destroyed; and approximately 56,000 people were left homeless. However, the greatest damage occurred in the agricultural sector, with losses estimated at $1.3 billion.

Action Taken by the Government of Argentina (GOA) and Non-Governmental Organizations

On November 10, the Provincial Office of Civil Defense declared a state of emergency in 54 districts of Buenos Aires Province. Approximately 46,000 people were evacuated to schools, churches, and other public shelters. The national armed forces provided helicopters, boats, and other logistical support and the government oil company, Yacimientos Petroliferos Fiscales, donated fuel for these rescue operations. The National Directorate of Social Emergencies, part of the Ministry of Health and Social Action, provided food, blankets, mattresses, clothes, and medicines to the evacuees. Several local charity organizations, including the Argentine Red Cross, Caritas, the Argentine Federation of Churches, and the Salvation Army, donated relief items to people left homeless by the floods. On November 19, President Alfonsin designated a personal representative to coordinate the GOA relief and rehabilitation program. The government announced that affected areas would be guaranteed rehabilitation loans and credit arrangements.

Assistance Provided by the United States Government

On November 15, the Governor of the Province of Buenos Aires and the GOA Foreign Office made an official request for assistance. On November 19, U.S. Ambassador Theodore E. Gildred determined that the disaster warranted USG assistance. He sent the MDRO to La Plata to determine the most urgent needs and to ascertain how the Ambassador's Authority of $25,000 could be used. Following the MDRO's recommendation, the Ambassador presented two checks of $12,500 each to Caritas and AMAD (Ayuda a la Minoridad y Ancianidad Desprotegida — Assistance to Unprotected Children and Elderly People), a local charity organization. Caritas used the donation to purchase materials to construct temporary shelter, and AMAD bought milk, blankets, and protective footwear for children and the aged.

TOTAL $25,000

Assistance Provided by U.S. Voluntary Agencies

CWS — donated $5,000 to the Federacion Argentina de Iglesias Evangelicas (Argentine Federation of Churches) to buy shoes, blankets, and mattresses for evacuated persons.

TOTAL $5,000

Assistance Provided by the International Community

None reported

Floods

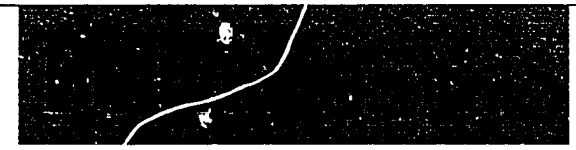
Date:
January-May 1986

Location:
Lowlands surrounding Lake Titicaca, lands bordering the Desaguadero River, the shores of Lake Poopó, the city of La Paz, and the departments of Cochabamba and Santa Cruz

No. Dead:
29

No. Affected:
estimated 260,000 have destroyed or damaged houses and/or fields

Damage:
Flood waters inundated 65,000 ha of cultivated cropland, damaged at least 21,000 dwellings (of which 3,000 on the shores of Lake Titicaca were destroyed), blocked railways and roads, and severely damaged the ports of Desaguadero and Guaqui.



The Disaster

The early arrival of rains in October coupled with heavy and persistent rains beginning in the first week of January caused severe flooding and landslides in Cochabamba, Santa Cruz, Oruro, and La Paz departments. It was the worst flooding of this century.

The rains fell unceasingly and the water level of Lake Titicaca, a large lake which straddles the Bolivia-Peru border, rose at a rate of two to three cm each day. By February, 11,300 people had been evacuated from the surrounding area. Flood conditions existed up to five km inland from the lake's former shoreline. By March, the lake had reached a level approximately 2.8 m above normal. As the lake overflowed its banks, it washed away adobe houses and blanketed cultivated fields in the department of La Paz. The Desaguadero River, which flows south from Lake Titicaca to Lake Poopó (in the department of Oruro), also swelled and overflowed, causing additional damage.

Losses to families in the flooded areas were quite serious. In the capital city of La Paz, heavy rains and landslides destroyed at least 95-100 houses. In the department of La Paz, 3,376 homes around the lake's edge were destroyed and 12,599 ha of cultivated land were flooded, affecting approximately 83,000 people. Some families that had suffered crop damage were able to harvest crops in higher, less-affected areas. Others, however, were unable to harvest any of their crops. The food supply in the stricken area was not expected to last beyond June or July. Homes and agriculture in other departments were similarly affected. Countrywide, an estimated 21,000 homes were damaged with 65,000 cultivated ha flooded and 260,000 people affected.

Floods caused serious damage to infrastructure throughout the country. Roads and railways were buried under water or cut off by mudslides. The main artery between La Paz and Cochabamba was blocked by overflowing rivers, severely disrupting transportation. In eastern Bolivia, a train bridge across the Río Grande near Santa Cruz was partly damaged, thus hampering transport to Brazil. In one area, a landslide buried a bus and killed 29 passengers. The port cities of Guaqui and Desaguadero were under water. Both experienced damage to public buildings, port facilities, and railways.

Action Taken by the Government of Bolivia (GOB) and Non-Governmental Organizations

By December, continued heavy rain and rapidly rising water levels threatened to cause severe flooding. During the first week of January civil defense authorities conducted a field assessment of flood conditions. Based on this report, the president of Bolivia declared a state of emergency in the departments of La Paz and Cochabamba on January 10. Three days later, the GOB requested that UNDRO launch an appeal for international assistance.

The National Civil Defense Committee (NCDC) coordinated all aid and continued to monitor the situation. In February the NCDC prepared an updated damage report which was made available to USAID, voluntary agencies, and other donors. The NCDC also distributed some of the initial relief supplies in coordination with the Bolivian Red Cross and the army. The Ministry of Health established an epidemic surveillance system in the affected area and delivered additional medical supplies as needed.

Local groups were also active in disaster relief activities. The Bolivian Red Cross established three camps sheltering 6,678 people in the area near the Desaguadero River. Bolivian artists contributed $14,000 to the relief effort.

Assistance Provided by the United States Government

In response to a GOB request of January 27, USAID agreed to provide water-testing equipment and spare parts for road-clearing equipment. The water-testing equipment was already in-country in support of an existing project. In February USAID responded to the need for emergency food supplies by providing 64 MT of P.L. 480 Title II food, enough to feed 25,000 people for one month. These in-country stocks were distributed by ADRA and Food for the Hungry International (FHI).

The GOB's assessment of conditions in February made it clear that the rains and flooding had caused widespread dislocation and hardship. On February 28, U.S. Ambassador Edward M. Rowell declared a state of disaster and allocated his $25,000 Ambassador's Authority toward meeting immediate relief needs. These funds were given to CARE/Bolivia ($8,000), Caritas Bolivia ($14,000), and Meals for Millions ($3,000). In addition, the Ambassador requested

plastic sheeting to be used for family shelters. OFDA responded by providing 360 rolls of plastic sheeting from its Panama stockpile and arranging for two DOD airlifts aboard a C-130 and a C-141 Channel Mission. When the plastic sheeting reached Bolivia, it was loaded on USAID trucks and distributed directly to those in need, including 81 families in the city of La Paz and 1,710 families whose homes had been destroyed by the high waters of Lake Titicaca. In April, OFDA sent two additional shipments of 100 rolls transported by DOD through regularly scheduled flights. OFDA also contributed $1,250 for local purchase of 27,600 m of rope, which was cut into 20 m lengths and distributed along with the plastic sheeting. Temporary housing needs were further assisted by an OFDA grant of $75,000 to Caritas Bolivia. These funds purchased materials for self-help efforts to build small adobe dwellings on high ground.

The USG also contributed to the rehabilitation of roadways. In March, USAID allocated $200,000 from its on-going disaster recovery project to purchase spare parts for construction equipment to rehabilitate roads in the department of La Paz.

As the rains continued and flood damage became more widespread, food needs also increased. USAID arranged for an additional 150 MT of P.L. 480 Title II food to be delivered by April 30, enough to sustain 47,000 people through May. In view of the fact that agricultural recovery would not occur until March 1987, a larger donation of 3,000 MT of food was subsequently made to CRS in order to sustain the same number of people for an additional nine months.

During the disaster, the USG sent a number of disaster specialists to Bolivia. The OFDA regional disaster expert and an American National Red Cross delegate visited flood-damaged areas in Bolivia and similarly affected regions in Peru to assess needs and aid relief efforts. The Director of OFDA's Latin America and the Caribbean region also visited the stricken area to observe how USG assistance was being used and determine if further aid was required.

Summary of USG Assistance

Ambassador's Authority provided $8,000 to CARE, $14,000 to Caritas and $3,000 to Meals for Millions $25,000

560 rolls of plastic sheeting from OFDA stockpile in Panama $166,836

Cash grant for local purchase of 27,600 m of rope $1,250

DOD airlifts of plastic sheeting $33,488

Grant to Caritas to purchase materials for temporary shelters $75,000

3,214 MT of P.L. 480 Title II food (214 MT from in-country stocks and an additional 3,000 MT imported for CRS) $1,559,000

Spare parts for construction equipment to repair roads from USAID disaster recovery project funds $200,000

Travel and administrative expenses of OFDA disaster relief officer (OFDA travel account) $1,126

Total OFDA $302,700
Total FFP $1,559,000
Other USG $200,000

TOTAL $2,061,700

Flood victims in Chahuira Pampa use plastic sheeting for temporary shelter.

Assistance Provided by U.S. Voluntary Agencies

ADRA — reallocated in-country stocks of P.L. 480 Title II food.

ANRC — donated 2,000 articles of new clothing, valued at $87,000.

CARE/Bolivia — with a grant from OFDA, purchased and distributed local food supplies and tools.

CRS/Caritas — distributed a supplemental 3,000 MT of P.L. 480 Title II foods for an emergency rehabilitation program; built 240 temporary housing units, financed by OFDA; and distributed blankets, valued at $5,000.

Food for the Hungry International — reallocated in-country stocks of P.L. 480 Title II food.

Meals for Millions — purchased and distributed food with funds provided by OFDA.

WVRO — provided 100 shovels, 100 pick axes, 50 wheelbarrows, three water-pumps, 140 mattresses, 280 blankets, 70 stoves, 70 sets of kitchen utensils, and 2,000 liters of diesel oil; total value $25,370.

TOTAL $117,370

Assistance Provided by the International Community

International Organizations

EC — provided a physician, three logistics experts, and two locally hired drivers through Medecins sans frontières; donated 600 small tents, ten large tents, and 6,000 blankets, as well as transport for these items; gave a cash grant for the local purchase of sheet iron, medicine, and material for temporary shelter; and supplied rental and maintenance of two vehicles; total value $351,782.

LRCS — donated 4,000 blankets, 200 tents, and other housing material; value not reported.

PAHO/WHO — locally purchased medical supplies with money supplied by Canada and UNDRO.

UNDRO — contributed $30,000 to PAHO/WHO for medical supplies.

UNICEF — provided $5,000 worth of medicine and basic health services for mothers and children; valued at $100,000.

Governments

Argentina — 600 blankets, 100 tents, ten rolls of plastic, and 12.6 MT of food; valued at $20,000

Australia — contributed $1,786 through the Bolivian Red Cross and $7,143 through UNDRO.

Canada — contributed $25,000 through UNICEF for malaria and respiratory tract medicine and rehydration salts, $17,986 through LRCS for local purchase of food, blankets, tents, medicine, and clothing, and $16,547 through PAHO/WHO for five portable water purifiers.

Germany, Fed. Rep. — contributed $38,220 to cover local purchase of relief items.

Japan — gave $100,000 for local purchase of priority relief items.

Norway — gave $46,980 to the Pentecostalist Missionary Society for repair of the children's village, Nueva Esperanza, and $50,000 through the Norwegian Missionary Alliance for local purchase of food, clothes, medicine, blankets, gas stoves, beds, and school material.

Spain — donated 2.5 MT of medicine; valued at $13,793.

United Kingdom — contributed $55,944 for medicine, $129,171 for local purchase of supplies, $59,080 to UNDRO for relief supplies, and $37,313 to LRCS for tents and blankets.

Vatican — provided $20,000 through Caritas Bolivia.

Buildings crumbled when water inundated Guaqui.

Non-Governmental Organizations

Andorra Red Cross — gave $500.

Australia Red Cross — contributed $2,142.

Brazil Red Cross — provided 10,250 water purification tablets; value not reported.

Canada Red Cross — donated $3,597.

Contributions from national Caritas organizations through Caritas Internationalis:

Austria — $11,500
Belgium — $4,425 and 2,000 blankets
France — $5,520
Germany, Fed. Rep. — $53,252
Italy — $30,375
Netherlands — $24,505
Spain — $5,000
Switzerland — $50,761

Chile Red Cross — donated 100 blankets and 80 bottles of water purification tablets; value not reported.

Denmark Red Cross — gave $11,560.

Developpement et Paix/Canada — donated $7,400 through Caritas Internationalis.

Finland Red Cross — gave $9,524.

Iceland Red Cross — gave $2,688.

Japan Red Cross — contributed $5,555.

New Zealand Red Cross — donated $526.

Norway Red Cross — contributed $13,699.

Secours Populaire Francais — contributed $4,300 and provided the services of a physician.

Soviet Union Red Cross — supplied 1 MT of medicine, 1,000 blankets, and 100 tents; value, induding transport, was $63,552.

Spain Red Cross — provided 3,000 blankets, 2 MT of clothing, 20 large tents, 2 rafts, and 673 kg canned food; valued at $45,513.

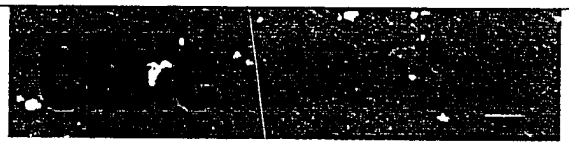
Sweden Red Cross — contributed 4,000 blankets, 200 tents, and ten flexcamps; value of items, plus transport, was $79,118.

Switzerland Red Cross — supplied 150 kg of medicine; value not reported.

United Kingdom Red Cross — contributed $7,462 to LRCS for tents and blankets.

TOTAL $1,568,219

Floods



Date:
June 15-17, 1986

Location:
Central Chile, particularly the Fifth, Sixth, Seventh, and Metropolitan regions; Region Six was the hardest hit.

No. Dead:
15; 8 persons reported missing

No. Affected:
41,005 reported homeless without public shelter and 13,113 homeless in public shelters (June 25)

Damage:
Considerable damage to the water system in Santiago and to roads, bridges, and other public infrastructure in the central region; significant losses to private housing.

Prefabricated house in OFDA-assisted emergency shelter program

The Disaster

Heavy rains, falling between June 15 and 17, fed rivers and streams in Chile's central zone. These downpours, combined with a freak snowmelt (activated by unusually high temperatures in the Andes), caused serious flooding in the Metropolitan Region of Santiago and Regions Five, Six, and Seven. The floods washed away portions of the Pan-American Highway — the only north-south link for much of the country — necessitating a shutdown of the thoroughfare for several days and cutting off some areas from supply by land. In all, 40 bridges were destroyed or damaged and 104 roads cut.

Housing was hardest hit. A total of 1,500 homes were destroyed, 4,600 rendered uninhabitable, and more than 7,100 suffered some damage. Region Six bore the brunt of the flooding: approximately two-thirds of the homes in this area were damaged. The Claro River broke out of its normal channel and flooded the town of Rengo with swiftly flowing water for three days. After the waters receded, most houses and commercial buildings were still standing, with few buildings destroyed or even visibly damaged. However, closer inspection revealed that the interiors of whole city blocks of adobe buildings were covered with several centimeters of mud and floors had buckled from expansion.

Mud clogged the intake valve at the main water purification plant serving Santiago, depriving about 40 percent of the city's population of potable water. In addition, a 200-meter portion of pipeline of the principal aqueduct was destroyed. Many schools and hospitals suspended or reduced operations due to the lack of water.

Action Taken by the Government of Chile (GOC)

On June 20, President Augusto Pinochet declared 18 townships in the Metropolitan, Sixth, and Seventh regions catastrophe zones. A General Emergency Headquarters, staffed by Army officers, was established in the Ministry of the Interior. (A similar body was created after the March 3, 1985, earthquake. See CHILE—Earthquake, *OFDA Annual Report, FY 1985*)

The GOC concentrated its efforts on infrastructure repair, particularly the Santiago water system and the critical north-south highway. The ministers of the Interior and Public Works announced emergency measures to deal with the lack of potable water affecting 40 percent of Santiago's population. Temporary solutions to the water problem included reopening old wells, rehabilitating out-of-use water channels, and requesting the public to minimize its use of water. Army crews set up temporary bridges to replace those swept away by rushing currents. In addition, Air Force aircraft evacuated victims and delivered relief supplies.

Assistance Provided by the United States Government

In response to the flooding, U.S. Ambassador Harry G. Barnes Jr. declared on June 20 that emergency relief was warranted. On June 25, Ambassador Barnes delivered a $25,000 check to Caritas Chile, which mounted an emergency shelter project to help low-income people rendered homeless by the floods. This project entailed the construction of 50 wooden shelters (mediaguas) in the affected areas.

The damage to housing was scattered and deceptive. Initial reports indicated that the number of damaged homes was limited; however, subsequent information revealed that the situation was far more serious. Flood waters eroded adobe walls and weakened foundations, leaving many structures uninhabitable although they appeared sound from without. To further compound the effects, the flood damages came on top of an existing housing deficit estimated at approximately 750,000 to 800,000 houses.

In view of this situation, OFDA provided an additional $100,000 to assist Caritas Chile develop a more extensive shelter project in the areas of greatest need. These funds allowed for the construction of 200 mediaguas and other emergency shelters for an estimated 1,000 people. The 200 mediaguas were divided among four communities where Caritas representatives and local parishes worked closely with community leaders in implementing the program. In Lo Barnechea, a small community on the periphery of Santiago, 30 wooden shelters were built. The remaining units were distributed in communities lying to the south of the capital: 60 units were erected in Rengo; Molina received 70 new structures; and 40 shelters were constructed in Lincanten.

Summary of USG Assistance

Ambassador's Authority given to Caritas Chile for an emergency shelter program ... $25,000

Grant to Caritas Chile for an expanded shelter program $100,000

TOTAL $125,000

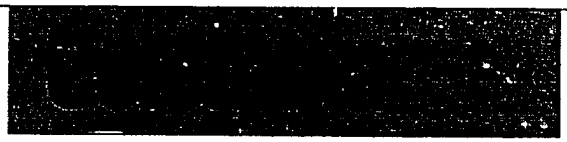
Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

None reported

Volcanic Eruption



Date:
November 13, 1985

Location:
Departments of Tolima and Caldas, affecting 15 municipalities

No. Dead:
21,800 estimated

No. Affected:
7,700 homeless;
5,000 injured

Damage:
Near total destruction of the town of Armero (department of Tolima); surrounding rural areas covered with mud, ash, and stones. Damage and fatalities in Chinchina (department of Caldas). Total damage estimated at over $1 billion.

Nevado del Ruiz on September 23, prior to the devastating eruption on November 13

The Disaster

On November 13, 1985, the calamitous eruption of Nevado del Ruiz, the northernmost active volcano in the Andes chain, stunned the world by virtually erasing an entire town and claiming an estimated 21,800 lives. Shortly after 3:00 p.m. (local time) a strong phreatic, or steam, explosion occurred in Arenas Crater. Witnesses north of the volcano reported hearing a deep rumble come from the mountain and seeing a black plume rise from the summit. Fine lithic ash dusted areas northeast of the volcano. At 9:09 p.m. a paroxysmal eruption began with two forceful explosions. A series of pyroclastic (hot ash and volcanic fragments) flows and surges issued from the crater and melted a part of the summit ice cap, sending torrents of meltwater, ice, and debris cascading down river channels on the flanks of the volcano. Volcanic mudflows, known as lahars, originated in the headwaters of the Molinos and Las Nereidas rivers on the volcano's western slope, and also in those of the Azufrado and Lagunillas rivers on the eastern flank. The lahars coursed down the river channels, sweeping up trees, brush, rocks, and soil as well as bridges and houses in their paths.

On the volcano's fertile western slope, mudflows damaged the town of Chinchina and killed 1,800 people. Along the river banks more than 200 houses were washed away and bridges linking Chinchina to the cities of Pereira and Medellin were destroyed. To the east of the volcano, mudflows in the Guali river stripped away houses on the outskirts of Mariquita and destroyed the bridge on the main road to Bogotá. But it was the town of Armero (population 29,170) which sustained the most devastating and shocking losses. Shortly before midnight successive waves of mudflows overran Armero, dragging homes, cars, and debris eastward toward the Magdalena River. As many as 15 m of mud blanketed the town and entombed 20,000 bodies, injured approximately

5,000 people, and obliterated as much as 85 percent of the town. Many injured survivors were trapped by the mud over an area of about 36 sq. km.

Both local and regional damage occurred. All area roads, bridges, aqueducts, telephone lines, and electrical grids were damaged to varying degrees or destroyed. In addition, public and personal records disappeared in the mire, adding to the confusion and complicating recovery. Sixty percent of the region's livestock, 30 percent of its grain, sorghum, and rice crops, and 500,000 bags of green coffee were lost in the disaster. The mudflows wiped out 19 bridges and damaged 3,800 ha of agricultural land. Approximately 50 schools suffered damage or destruction and two hospitals (one a psychiatric facility, the other a general care hospital) were wrecked. The National Coffee Research Center (CENICAFE), based in Chinchina, was damaged and 58 industrial plants and 343 commercial establishments were destroyed.

Action Taken by the Government of Colombia (GOC) and Non-Governmental Organizations

The morning after the eruption, President Belisario Betancur surveyed the disaster zone by helicopter and initiated immediate life-saving operations. Emergency situations were declared in the departments of Tolima and Caldas. The Colombian president issued a request for assistance from all foreign embassies in Bogotá and, in addition, the GOC petitioned UNDRO to launch an international appeal for assistance.

The National Emergency Committee — divided into subcommittees comprising Relief, Technical, Communications/Transportation, and Reconstruction — began the daunting task of mobilizing the country's resources to respond to the catastrophe. Working through different ministries and government agencies, the National Emergency Committee carried out a series of actions aimed at aiding the victims and restoring the disaster zone to normalcy. These activities included providing emergency health services to victims, repairing and reconstructing roads and bridges, rehabilitating damaged water systems, and providing shelter and food to those rendered homeless.

Initial assessment revealed the need for evacuation helicopters to extricate victims trapped in the mud and sludge and to ferry relief supplies to the stricken area. The consistency of the mud was such that it could not support the weight of rescue workers or equipment, thus helicopter rescue was the only viable alternative. However, as helicopters and related equipment were in short supply, the GOC requested this type of assistance from the international donor community.

The Ministry of Defense assumed responsibility for all rescue operations. The Colombian Armed Forces established an emergency operations center at Palanquero Air Force Base, near the town of La Dorada, and an analogous office in Bogotá, for coordination and distribution of relief items. The Colombian Army, Civil Defense, and the Colombian Red Cross (CRC) worked together in a massive rescue effort. The GOC used 50 light planes and helicopters in search and rescue operations. Rescuers transferred thousands of injured victims to Lérida for emergency first aid. Some of the casualties then were transported to other area hospitals and Bogotá for treatment. Approximately 2,000 volunteers worked in shifts to administer first aid, transport the wounded, and set up provisional shelters in schools and public buildings. The CRC distributed clothing, blankets, and food and organized auxiliary ambulance services.

Although the devastation had been definitive, seismic activity continued unabated, and it could not be determined if the eruption of 9:09 p.m. on November 13 had been the major event. The GOC and the international scientific community recognized the urgent need to monitor the volcano.

Donors dispatched seismic monitoring equipment and scientists to assist the GOC keep the volcano under close observation and record signs which might presage an eruption. The eleventh floor of the Banco de Cafeteros in Manizales served as headquarters for these activities. Staffed around-the-clock by international teams of scientists, the observatory contained sensitive equipment to record and analyze data generated by instruments installed on the volcano. In February 1986 the Manizales Volcano Observatory became a regional office of INGEOMINAS (the Colombian Geological Survey), responsible for the continued monitoring of Nevado del Ruiz.

On November 26, the GOC created a decentralized foundation, RESURGIR, to take charge of reconstruction and rehabilitation of the affected areas.

Assistance Provided by the United States Government

On November 14, U.S. Ambassador Charles A. Gillespie Jr. declared that the destruction wrought by Ruiz's eruption warranted USG assistance. Exercising his Ambassador's Authority, Ambassador Gillespie made $25,000 available to cover local support costs for U.S. relief personnel. The Ambassador created a Volcano Task Force (VTF) at the U.S. Embassy in Bogotá. Under the direction of A.I.D. and the Embassy's Economic Section, the VTF coordinated all USG and U.S. private sector relief efforts in Colombia. In addition, the Embassy established an Emergency Operations Center (EOC) in the Hotel Carrera in Manizales, 30 km northwest of Ruiz. The VTF and EOC staff provided logistical support for all USG and private sector representatives involved in rescue operations, scientific assessments, and relief and rehabilitation endeavors. Because of continued seismic activity and the risk of further eruptions, both the VTF and EOC remained operational through late April. USAID personnel on temporary duty assignments from Washington, D.C., and neighboring countries staffed the EOC, thus reducing the burden on U.S. Embassy personnel.

In Washington, D.C., OFDA assembled a 24-hour working group charged with coordinating the USG response. The first order of business was to detail OFDA regional disaster relief expert Paul Bell and Dr. Darrell Herd, volcanologist with the U.S. Geological Survey (USGS), Office of Earthquakes, Volcanoes, and Engineering, to the disaster site to assess damage and needs. (Under OFDA funding, Dr. Herd had worked with his Colombian and international counterparts on a hazard and risk assessment of the volcano in September. A detailed risk map, published in October, was the product of this collaborative effort.) In coordination with U.S. Embassy representatives, the GOC, and other international donors, these disaster experts worked to determine the appropriate USG disaster relief response. The USG response comprised the immediate relief stage lasting into December and the longer-term effort—spanning several months—of assisting the GOC build a permanent volcano monitoring center.

U.S. helicopter recovers a team of geologists from Nevado del Ruiz's northeast flank.

Immediately following the eruption, 12 DOD helicopters (eight UH-60 Sikorsky Blackhawks and four CH-47 Boeing Chinooks) equipped with support and medevac personnel were deployed from the U.S. Southern Command in Panama to augment GOC evacuation and rescue operations. Two DOD C-130s, one carrying helicopter ground support equipment to the GOC's Palanquero Air Force Base, the other conveying fuel bladders and refueling equipment to an airstrip in Monteria, were also dispatched from Panama. The helicopters and fixed wing aircraft transported an estimated 1,100 injured or stranded victims and moved over 315 MT of emergency supplies. Eight helicopters returned to base on November 28; the remaining four Blackhawks continued to fly support missions for geologists and seismologists monitoring the volcano. Two of the four helicopters returned to base on December 13; December 20 marked the withdrawal of the last two helicopters.

OFDA supplied 500 tents with tent flys, five tent repair kits, and 2,250 wool blankets from its Panama stockpile for those rendered homeless by the disaster. These supplies were transported aboard three DOD C-130s. In addition, OFDA provided communications equipment — four portable radios, one stationary transceiver, and accessories — to supplement OFDA's regional communications ensemble being used by relief workers at the disaster site.

On November 19, A.I.D. Administrator M. Peter McPherson traveled to Colombia in his capacity as the President's Special Coordinator for International Disaster Assistance. Mr. McPherson visited the disaster area and met with Colombian President Betancur and Foreign Minister Ramírez Ocampo to discuss future USG efforts.

OFDA, in coordination with the USGS, fielded a series of 20 volcanologists, seismologists, and mudflow experts armed with sophisticated volcano monitoring and warning instrumentation. Once installed, earth deformation monitoring equipment (including several laser distance-measuring reflectors and base stations), telemetered seismographic stations, and tilt arrays generated data for analysis by scientists manning the Manizales Observatory. In June of 1986 the USG officially donated this monitoring equipment, valued at $293,500, to the GOC. In addition to helping the GOC equip the Manizales-based observatory, by training Colombian professionals in data collection and interpretation and equipment maintenance and repair, USG technical assistance contributed to the development of a pool of skilled Colombian volcano experts.

Summary of USG Assistance

Ambassador's Authority, used for local support costs	$25,000
12 DOD helicopters, support personnel, and C-130 resupply missions	$2,134,400
DOD airlift of relief supplies	$18,972
500 tents w/flys, 5 repair kits, and 2,250 wool blankets (value not included in total)	($219,000)
Communications equipment (radios, transceivers, and accessories)	$24,061
Charter of 2 aircraft to transport USGS scientists and equipment from Oregon and California to Colombia	$69,000
Local charter of airplane	$1,251
Technical assistance of USGS personnel and equipment costs	$427,885
Temporary duty assignments of specialists and local administrative support costs	$22,667
Mission allotment for additional local support costs	$21,065
OFDA personnel (travel account)	$4,027
TOTAL	**$2,748,328**

Assistance Provided by U.S. Voluntary Agencies and Other Private Groups

Adventist Development and Relief Agency (ADRA) — sent 60 people by truck from an Adventist college located 100 km from the disaster site to help with rescue efforts. ADRA also airlifted 2,400 blankets, clothing, water purification tablets, medicines, and food; estimated value, $250,000.

American Jewish Joint Distribution — gave $21,000 through the American Jewish World Service for support of a brick factory.

American Jewish World Service — contributed $110,000 toward the construction of a brick factory in Guayabal, in coordination with the Colombian Jewish community and Abe Nathan,

an Israeli philanthropist. The factory subsequently produced bricks used for reconstruction in the affected areas.

American National Red Cross — provided 20 generators to the CRC, value not reported.

Americares — sent 1,850 tents; 7 shipments via Avianca Airlines comprised tents, medicine, generators, and shovels; 2 shipments of clothing, assorted medicine and medical supplies, and blankets. Approximate value, $900,000.

Bell Corporation — donated the use of a Bell 212 helicopter, pilot, and 2 maintenance personnel for rescue and clean-up operations; value not reported.

CARE — dispatched a representative to conduct an assessment; provided $100,000 to an agricultural cooperative in Armero to finance marketing transactions, $8,000 to Civil Defense for communications equipment, and $10,000 to the CRC for a census and a needs assessment.

CRS — provided $50,000 for local purchase of food, cooking utensils, and blankets. In addition, released 45 bales of clothing from in-country stocks and gave 50 bales of blankets and clothing, and water purification tablets, valued at $50,000. Nearly $400,000 went to emergency welfare assistance, including funds for an orphanage. In all, more than $1,100,000 was committed to relief, housing, and employment programs.

CWS — gave 16,500 blankets and 300,000 water purification tablets to the Association of Evangelical Pastors; valued at $70,000.

Food for the Hungry International — gave $5,000 in cash and blood plasma valued at $200,000 through World Vision International.

LWR — contributed 7,750 blankets to Caritas, valued at $9,500.

Mennonite Central Committee — provided $10,000 for the local purchase of emergency relief items to include food, clothing, medical supplies, and temporary shelter.

Occidental Petroleum — President Armand Hammer contributed $1,000,000 to the relief effort.

Pan American Development Foundation — provided 10 generators, 11,000 boxes of canned food, and flashlights, transported from Miami by Avianca Airlines; value not reported.

Partners of the Americas — established the Partners Colombian Emergency Fund which raised $38,000 by January 1986. Partners' efforts concentrated on rehabilitation for injured persons and employment generation programs for displaced persons.

Salvation Army — dispatched a team from Costa Rica to assist the Colombian Salvation Army staff and provided $10,000 for the local purchase of relief supplies.

SCF — dispatched its regional director and a team from Bogotá to the disaster site; locally purchased $10,000 worth of tents, blankets, generators, flashlights, batteries, and health supplies; arranged for a DC-3 to deliver supplies to the disaster site; and provided 5,000 doses of sylacaine and 10,000 doses of lydocaine.

Southern Baptist Convention — contributed $10,000 in cash and $65,000 worth of medical supplies, food, clothing, 12 portable generators,

Devastation caused by volcanic mudflows

OFDA logistician tracking USG assistance.

and blankets. A medical team, including orthopedic surgeons, was dispatched. Long-range assistance geared toward rehabilitation through job training opportunities and the provision of prostheses and rehabilitation for amputees was also provided.

World Concern — sent an emergency team of 4 paramedics and 1 doctor to the disaster site and contributed $24,000 worth of medical supplies.

World Relief Corporation — donated $20,000 in cash, sent 100 tents, antibiotics and medicine, and deployed a two-member team.

WVRO — sent 2 assessment teams, relief supplies, including blankets, clothing, cooking sets, water containers, tents, medicine, portable stoves, and food. The total cost including air freight was $200,000.

YMCA — participated in rescue activities, delivered emergency supplies, provided storage space for relief supplies, and contributed $5,000 to its Colombian counterpart for food, clothing, and shelter for homeless children.

Foreign oil companies and other multinationals working in Colombia made various contributions in cash and in-kind to the disaster victims. The Colombia-American Chamber of Commerce hired a private firm to receive all donations and contributions from the chamber members and funnel these directly to the victims.

TOTAL $4,175,500

Assistance Provided by the International Community

International Organizations

EC — gave $165,289 for the local purchase of relief supplies through LRCS, a grant of $247,800 through Medecins sans frontieres, and additional emergency aid of $1,500,000 through LRCS.

ECLAC (Santiago) — dispatched a disaster assessment expert to assist in damage evaluation, value not reported.

FAO — provided $443,000 worth of donated food including 236 MT of wheat flour, nonfat powdered milk, vegetable oils, and dehydrated foods to feed 6,000 people for 3 months.

LRCS — sent a representative to assess damage and needs; donated $50,000 in cash to the CRC; and sent 3,000 tents collected from European member countries. LRCS also established a program for displaced victims implemented in cooperation with the CRC and the GOC. Under the program, blankets, tools, clothes, and other relief supplies, along with a three-month supply of food and medicine, were distributed.

PAHO — sent portable satellite communications equipment, an operator, and 10,000 ampules of calcium hypochloride for water purification; also provided medical supplies valued at $25,000 to the Ministry of Health and 30 small surgical equipment kits.

UNDP — resident representative called a meeting November 18 to initiate coordination and information-sharing among international donors and the GOC. Toward this end, the UNDP distributed an information bulletin every other day. A formal meeting with the GOC National Emergency Committee was held November 20. UNDP gave $30,000 from special program resources.

UNDRO — gave a cash grant of $30,000; sent staff to assist the U.N. resident representative assess emergency needs and coordinate the international relief effort; and sent a volcanologist with seismographic equipment to analyze gases. UNDRO also airlifted 100 family tents, 2,600 blankets, 10 4.5-kW generators, and 500 steel jerry cans for water; valued at $260,000. At the November 18 donors' meeting, Colombian Civil Defense briefed participants and the UNDRO volcanologist shared the results of his survey of the disaster area. Represented at the

meeting were 42 embassies, 12 international organizations, the National Emergency Committee, and other GOC organizations.

UNESCO — dispatched a volcanologist and a seismologist.

UNICEF — locally purchased 700,000 halazone tablets and 400,000 packets of oral rehydration salts. In addition, 234,000 halazone tablets, 1,250 units surgical pins for fractures, 3 portable pumps for mud removal, 3 electric/gasoline pumps, 5,000 m polyethylene hose, X-ray plates, film hangers, 500 bottles of calcium hypochloride, 10 comparators, and 100 portable latrines; total value, $100,000.

WFP — provided 162 MT of rice, 22 MT of DSM, 16 MT of vegetable oil, enough for 6,000 people over a 90-day period; valued at $442,900.

WHO — contributed $50,000 through PAHO for the purchase of equipment and supplies for vector control and environmental sanitation.

Governments

Argentina — donated 14 MT of food, 150 tents, 100 rolls of plastic sheeting, 1,300 pairs of shoes, clothing, 1,000 doses of typhoid vaccine, 5,000 doses of tetanus vaccine, and 25 MT of medicine and medical equipment for treatment of 10,000 people; total value, $70,000.

Austria — gave a cash grant of $103,093 through the Austrian Red Cross for the purchase of equipment.

Australia — gave a cash grant of $1,408,450.

Belgium — sent 20 MT of medical supplies, 1 doctor, and 2 nurses; gave $135,088 to LRCS and Colombian NGOs. In addition, contributed 2 water purification units, 500 jerry cans, medicines and sanitary supplies, through Red Cross and Medecins sans frontières; valued at $179,245.

Bolivia — dispatched $20,000 worth of medical and food supplies.

Brazil — contributed 12.1 MT of medicine, food, and clothing; value not reported.

Canada — provided a cash grant of $44,444 through UNDRO and blankets, water containers, and emergency medical supplies, valued at $74,074, through PAHO/WHO and LRCS.

Chile — sent 100 tents, 2,000 blankets, 100 small kitchens, 100 kerosene lamps, 100 pallets, 300 sheets of roofing material, and 416 mattresses; valued at $161,111, including transport.

Czechoslovakia — sent medical and hospital equipment, clothing, blankets, and food; value not reported.

Denmark — contributed 350 tents through the Red Cross, a $99,010 cash grant to LRCS, and $100,000 through Danish Church Aid.

Dominican Republic — contributed an undetermined quantity of relief supplies.

Ecuador — supplied a mobile hospital, 2 water purification plants, 17 doctors, 19 nurses, 15 rescue specialists, medicine, and the services of 2 helicopters; value not reported.

Finland — gave supplies and a cash grant of $169,492 through LRCS.

France — dispatched a nine-person medical team, 2 volcanologists, 2 helicopters for rescue operations, tents, 1,400 blankets, 1,000 pairs of boots, food, and medical and surgical equipment; value not reported.

Germany, Fed. Rep. — gave $36,101 through UNDRO for an airlift operation; airlifted tents, blankets, medicine, generators, and other items, valued at $288,808 (co-sponsored with the German Red Cross); contributed $36,101 to UNICEF for medical support; sent 57 cartons (2.4 MT) of antibiotics, valued at $26,923.

Guatemala — sent dextrose and 15 boxes of clothing; value not reported.

Honduras — furnished 10,000 first-aid kits, 7 electric generators, 7 MT of tents, 5 MT of blankets, and 6 doctors. Also, gave 250 tents and $63,492 through the Red Cross.

Hungary — $80,000

Ireland — contributed $118,343 through the Irish Red Cross.

Israel — gave 2.5 MT of medicine and medical equipment; valued at $80,000.

Italy — donated 100 family tents, 7,000 blankets, 14 MT of medicine, 20 boxes of surgical equipment, water, and other relief goods; total value $454,545, including transport.

Japan — dispatched 8 doctors, nurses, and engineers; gave $1,250,000 to the GOC and $50,000 in support of UNDRO's airlift operation; and installed flood warning sensor in drainage of

The Colombia Red Cross packaging relief supplies.

Molino River, and another in Guali River area. Japan also donated 5 tents, 100 blankets, 100 flysheets, 5 portable generators, 50 flashlights, 200 batteries, 20 megaphones, 20 ropes, 5 water purifiers, 100 water plastic containers, 40 shovels and picks, 14,000 disposable syringes, 16 sets surgical tools, 300 bottles serum, 750 boxes antibiotics, 200 sachets oral rehydration salts; valued at $100,000.

Mexico — contributed a mobile hospital, 10 MT of food, medicine, and medical and surgical equipment; value not reported.

Netherlands — donated $47,619 through UNDRO and an additional $2,287,302 in cash.

New Zealand — $54,054

Norway — contributed $65,000 through UNDRO, $60,827 through the Red Cross, and $254,777 through the Norway Red Cross.

Panama — gave medicine, food, blankets, and clothing; value not reported.

Peru — provided 30 MT of supplies including portable generators, medicine, food, blankets, and clothing; value not reported.

Poland — sent drugs, blankets, clothing, doctors, Red Cross volunteers, and mountain climbers; value not reported.

Romania — donated medicine and blankets; value not reported.

Soviet Union — contributed medicine, surgical equipment, bandages, and 100 tents; value not reported.

Spain — the Spanish Air Force airlifted 5 MT of medicine, 8 MT of tents, beds, blankets, and 6 generators; the aircraft was subsequently used in rescue and relief operations. A second airlift of 9 MT of blankets and medicine, a five-person seismological team, and 3 volcanologists with monitoring equipment was also provided; estimated value, $370,370. An additional 4.5 MT of relief supplies were later sent.

Sweden — donated $120,773 through UNDRO, $254,777 through LRCS, and $89,171 to Swedish NGO Taltmissionen/Happets Stjarna for the purchase of tents, blankets, and relief supplies.

Swiss Disaster Relief Unit — dispatched a four-person assessment team.

United Kingdom — sent 1 C-130 aircraft and 2 helicopters for rescue operations, generators, tents, drugs, rescue equipment, and a RAF rescue team and engineers; valued at $335,114. Through the British Red Cross, sent equipment for small-scale surgery, antibiotics, tetanus vaccine, antiseptics, local anasthetics, and sterile dressings; total value $63,920, including airlift.

Uruguay — sent 8 MT of drugs and an undetermined amount of food; value not reported.

Vatican — $100,000

Venezuela — furnished a mobile hospital and $1,000,000.

Yugoslavia — donated drugs and medical instruments, and $600,000 to be used toward reconstruction.

Non-Governmental Organizations

Cafod England — donated $7,150 through Caritas Internationalis.

Contributions from national Caritas organizations through Caritas Internationalis:

Australia — $21,900
Austria — $110,000
Belgium — $17,700
Canada — $7,400
Germany, Fed. Rep. — $35,840
Hong Kong — $1,000
Italy — $88,503
Netherlands — $50,000
Spain — $61,000
Switzerland — $43,740

Caritas Germanica/Diakonisches Werk — gave $93,000.

Caritas Vienna — 250 kg medicine

Corps Mondial de Secours — sent contingent of 14 rescue workers and 2 dog teams, 4 water pumps, 2 generators, 2 disinfection units, 3 boxes medical supplies, and assorted rescue equipment; value not reported.

Development and Peace (Canada) — contributed $22,000 through Caritas Internationalis.

Hôpital sans frontières — contributed analgesics, antibiotics, sulfamides, 2 boxes of emergency medicine, 50 blankets, 200 overcoats, needles and syringes; value not reported.

MSF (Belgium and the Netherlands) — dispatched 7 MT of tents, 5 MT of blankets, 6 portable generators, medical kits for 10,000 persons, 2 vehicles, and the services of 2 logistics officers and 6 medical staff, with funds donated by the EC.

Oxfam (UK) — provided $20,000 for local purchase of medicines.

Contributions from national Red Cross Societies:

Brazil — provided water purification chemicals, clothing, 700 m of cloth, bandages, 500 blankets, 20 lanterns, and 8 rolls of plastic roofing material; value not reported.
Canada — gave $7,407 in cash as well as 5,600 blankets and 250 water containers; valued at $5,350.
China, People's Rep. — donated $40,000 to the CRC.
Denmark — sent 350 tents; value not reported.
Finland — $169,492
Germany, Fed. Rep. — $144,404
Iceland — $4,650
Japan — contributed $50,000 in cash and a medical team, 10 generators, 20 search lights, 10 radios, medicine, and tents; value not reported.
Korea, Rep. of — $5,000
Mexico — sent a medical team, medicine, and first-aid material; value not reported.
Netherlands — $63,492
Nicaragua — $1,000
Norway — $60,827
Peru — gave 200 blankets, 10 bales of clothing, and 3 cases of shoes; value not reported.
Spain — provided 5 MT of medicine, 65 large tents, 100 camping beds, first-aid kits, 2,000 blankets, 2 generators, 4 MT of medical equipment, and 50 water tanks; value not reported.
Sweden — $241,546
Switzerland — provided 1,000 tents and $46,948.
United Kingdom — gave $7,190 in cash and 35 tents.

Rotary Clubs International — $50,000

Secours Catholique (France) — donated $17,640 through Caritas Internationalis.

Secours Populaire Francais — sent 30 family tents, 100 blankets, and an evaluation team; total value $25,000.

Trocaire (Ireland) — gave $11,200 through Caritas Internationalis.

TOTAL $15,726,392

Earthquake

Date:
October 10, 1985

Location:
Department of El Quiché—San Miguel Uspatán and surrounding areas, namely, villages of Tierra Blanca and San Antonio Chiquito, and cantons of Catoxac and San Lucas

No. Dead:
None reported

No. Affected:
12,000 left homeless

Damage:
Damage to housing and various public buildings

The Disaster

An earthquake measuring Richter magnitude 7.0 struck northern Guatemala on October 10, 1985, at 9:26 p.m. Emanating from the Chixoy-Polochic fault line, the quake's epicenter was located in Tierra Blanca, one of five hamlets in the municipality of San Miguel Uspatán. In Guatemala City, some 90 km to the southeast of the epicenter, the quake registered 5.0 on the Richter scale. Although no one perished, the earthquake destroyed or damaged beyond continued habitation more than 2,000 homes, rendering 12,000 people homeless and in need of emergency assistance.

In Uspatán (population 9,000), out of a total of 1,800 houses, 700 were completely destroyed and 300 severely damaged. Other buildings, including a church, warehouse, and various public buildings were destroyed or seriously damaged. In Tierra Blanca, all 27 houses of the village were destroyed. Other damage to housing was reported in surrounding regions.

Action Taken by the Government of Guatemala (GOG)

The government convened the National Emergency Committee (CONE), which directed the emergency relief effort. The first stage of the GOG's relief operation addressed the shelter, food, and medical requirements of the affected population. CONE created two tent encampments as temporary housing and provided medical aid through the Guatemalan Red Cross. In the second stage, the National Reconstruction Committee used heavy equipment to clear the debris of destroyed and damaged buildings, paving the way for reconstruction efforts under local authority.

Assistance Provided by the United States Government

On October 15, U.S. Ambassador Alberto M. Piedra declared that USG assistance was warranted and donated $15,000 of his Ambassador's Authority to CONE. The funds were applied to the local purchase of shelter materials for victims of the earthquake.

TOTAL $15,000

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

Germany, Fed. Rep. — provided $16,200 for food.

LRCS — launched an appeal for construction materials to rebuild 600 houses in San Miguel Uspatán.

UNDP — donated $30,000 for medical needs.

UNDRO — sent a representative to participate in the CONE meeting on emergency needs and subsequently issued a list of urgently needed material. Additionally, UNDRO contributed $30,000 for the purchase of construction material for provisional shelter of the affected population.

TOTAL $76,200

Fire

Date:
May 16-17, 1986

Location:
La Saline area of Port-au-Prince

No. Dead:
1

No. Affected:
3,300 homeless

Damage:
1,088 huts destroyed

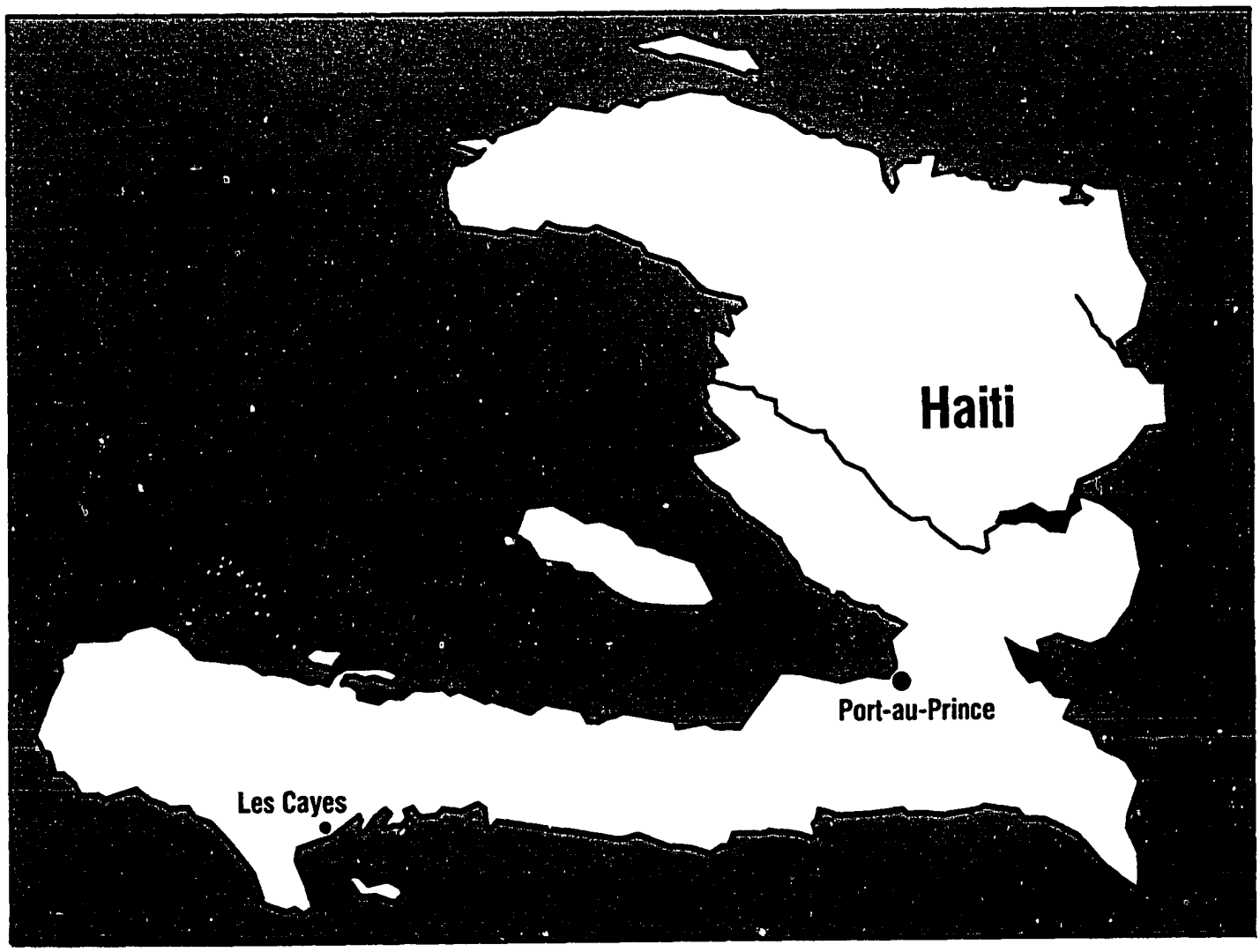
The Disaster

Fires broke out on two consecutive days in May 1986 in the populous La Saline slum area of Port-au-Prince. On May 16, fire swept through Block Rue 9, destroying approximately 549 huts and causing the death of a two-year old child. A second blaze the following day razed another 539 huts in Block Desmangles but caused no further deaths or injuries. The 3,300 people left homeless by the two fires lost all their household goods and personal belongings.

Action Taken by the Government of Haiti (GOH)

The Haitian Red Cross (HRC) offered assistance to the fire victims immediately after the blaze, and the GOH's Organization Pre-Desastre et de Secours (OPDES) conducted a damage assessment in the days following the disaster. However, neither the GOH nor local organizations had the resources to respond adequately to the victims' needs.

In a letter to USAID/Haiti, OPDES requested U.S. assistance in providing foodstuffs and basic necessities to the homeless. The distribution of P.L. 480 Title II commodities made available from the in-country stocks was car-



ried out through the mayor's office by the La Saline Community Action Councils under OPDES supervision.

Assistance Provided by the United States Government

After hearing the results of the OPDES damage assessment on May 29, U.S. Ambassador Clayton E. McManaway, Jr., determined that USG relief assistance was warranted in the La Saline fire disaster. From his disaster assistance authority, he donated the equivalent of $5,000 in local currency to the relief effort. A check was presented to the mayor of Port-au-Prince on June 5.

In response to the GOH request for emergency food assistance, the Mission authorized the release of 88 MT of P.L. 480 Title II commodities from the regular programs of PVO cooperating sponsors. The foodstuffs, which included SFB, NFCM, NFDM, and vegoil, were donated on a non-replacement basis.

TOTAL $5,000

Assistance Provided by U.S. Voluntary Agencies

CARE — reallocated 88 MT of P.L. 480 Title II commodities from regular program stocks for the emergency feeding of 3,300 fire victims for approximately two months. (See USG Assistance.)

Food for the Poor — furnished materials for rebuilding 360 dwellings as part of OPDES/UNDRO emergency housing program.

Assistance Provided by the International Community

International Organizations

UNDRO — assisted OPDES in the design and implementation of a home reconstruction project and contributed $11,788 in cash. The OPDES/UNDRO contribution focused on the provision of sanitation and water services and adequate fire protection. By early February 1987, 360 dwellings had been rebuilt, public water fountains installed, and restoration of water drainage system and latrines was under way. Drainage channels were being extended to ensure some benefits to disadvantaged homes not directly affected by the fire but in the immediate vicinity.

Governments

Switzerland — supported the OPDES/UNDRO emergency housing project by providing the services of a technical specialist to design and assist in implementing the project (the value of this contribution is reflected in the Haiti Floods case report), and contributed $71,212 in cash.

United Kingdom — provided $50,000 through UNDRO to support the OPDES/UNDRO emergency housing project.

TOTAL $133,000

Floods

Date:
June 1-3, 1986

Location:
Southern peninsula area of Les Cayes

No. Dead:
79

No. Affected:
85,000; 13,200 homeless

Damage:
In addition to damage to housing, regional agricultural losses included: cattle 5%, goats and sheep 14%, pigs 19%, draft animals 13%, and food 7%. One bridge was rendered unusable; 61 culverts, 16 potable water systems, and 154 km of irrigation ditches were damaged; 479 km of roads were damaged as well as 43 km of streets in Les Cayes and other towns.

A bridge spanning the Torbeck River collapsed in the floods.

The Disaster

When a late May tropical storm system stationed in the Caribbean area of Jamaica and Cuba moved east to Haiti in early June, heavy rainfall resulted in widespread flooding in Haiti's southern peninsula. The southwest coastal town of Les Cayes, population 40,000, experienced the greatest inundation. Within a 24-hour period ending in the early evening of June 3, the accumulated rainfall had caused rivers and streams to breach their banks. The rains and runoff from the plains created up to 1.5 m of standing water in the town of Les Cayes, damaging more then 300 homes and leaving 2,000 to 3,000 residents homeless.

Other coastal towns and two towns in the plains were also severely affected. From La Cahouane in the west to Les Cayes, virtually every town — including Les Anglais, Chardonnieres, Port-a-Piment, Roche-a-Bateau, Port Salut, St. Jean du Sud, and Torbeck — received some damage. The interior towns of Chantal, Maniche, and Cavaillon were also affected; flood waters from the Cavaillon River totally destroyed the market in Cavaillon about 15 km east of Les Cayes.

In total, more than 85,000 people were affected, 79 killed, 660 injured, and 13,200 rendered homeless. Some 3,400 houses were destroyed while more than 5,350 were seriously damaged. Thousands of head of cattle were reported dead or missing as well as 28,000 small livestock and over 36,000 poultry.

Action Taken by the Government of Haiti (GOH) and Local Voluntary Agencies

The Haitian disaster relief organization, Organization Pre-Desastre et de Secours (OPDES) and the Haitian Red Cross (HRC) immediately dispatched damage assessment teams to the Les Cayes region. A task force was established in the Ministry of Agriculture with FAO and USAID/Haiti representatives to assess crop damage. By June 5, the GOH Road Maintenance Organization had conducted an assessment and reported that a major bridge spanning the Torbeck River, about 5 km west of Les Cayes, had collapsed.

Electricity was restored on Les Cayes almost immediately. On June 4, the diesel plant which had been flooded was cleaned out and returned to operation.

The Service National d'Eau Potable (SNEP), the GOH water company, immediately began work to repair the Les Cayes water system, issuing radio warnings to the population to boil all water before use until the system was restored. In response to the temporary lack of potable water, the HRC sent 10,000 halazone tablets to Les Cayes for use in water purification. On June 11, the system was disinfected with chlorine provided by SNEP and the German Foreign Assistance Agency and was operational by June 14.

On June 7, the HRC attempted to send some emergency food supplies, including powdered milk and butter oil supplied by the HRC and rice supplied by the Ministry of Interior, to Les Cayes. Two military helicopters were used to transport the food. However, as the helicopters approached Les Cayes, a large crowd was forming near the army barracks, the site of the helicopter landing zone. Because of the crowd, the Les Cayes commandant canceled the landing, and the helicopters returned to Port-au-Prince. The Director of the HRC reported that the people in the Les Cayes town did not want food. They wanted jobs. Subsequent reports reiterated this.

On June 11, the Haitian Association of Voluntary Agencies (HAVA) convened a meeting of members and other donors to exchange information on the situation in the flood area. OPDES Director Christian Theodore reported that OPDES was assessing damage to the areas west of Les Cayes using helicopter support provided by the GOH military. An assessment of infrastructure damage was initiated by a five-man team from the Ministry of Public Works. The Ministry of Agriculture conducted a preliminary crop damage assessment and reported that 22,000 pounds of seeds were being procured locally for delivery to the Les Cayes area for replanting. Working with USAID, an UNDRO consultant, and HAVA members, OPDES initiated a rehabilitation/recovery program to return flood damaged lands to production and improve the vulnerability of housing in the Les Cayes area (See Assistance Provided by the USG).

Assistance Provided by the United States Government

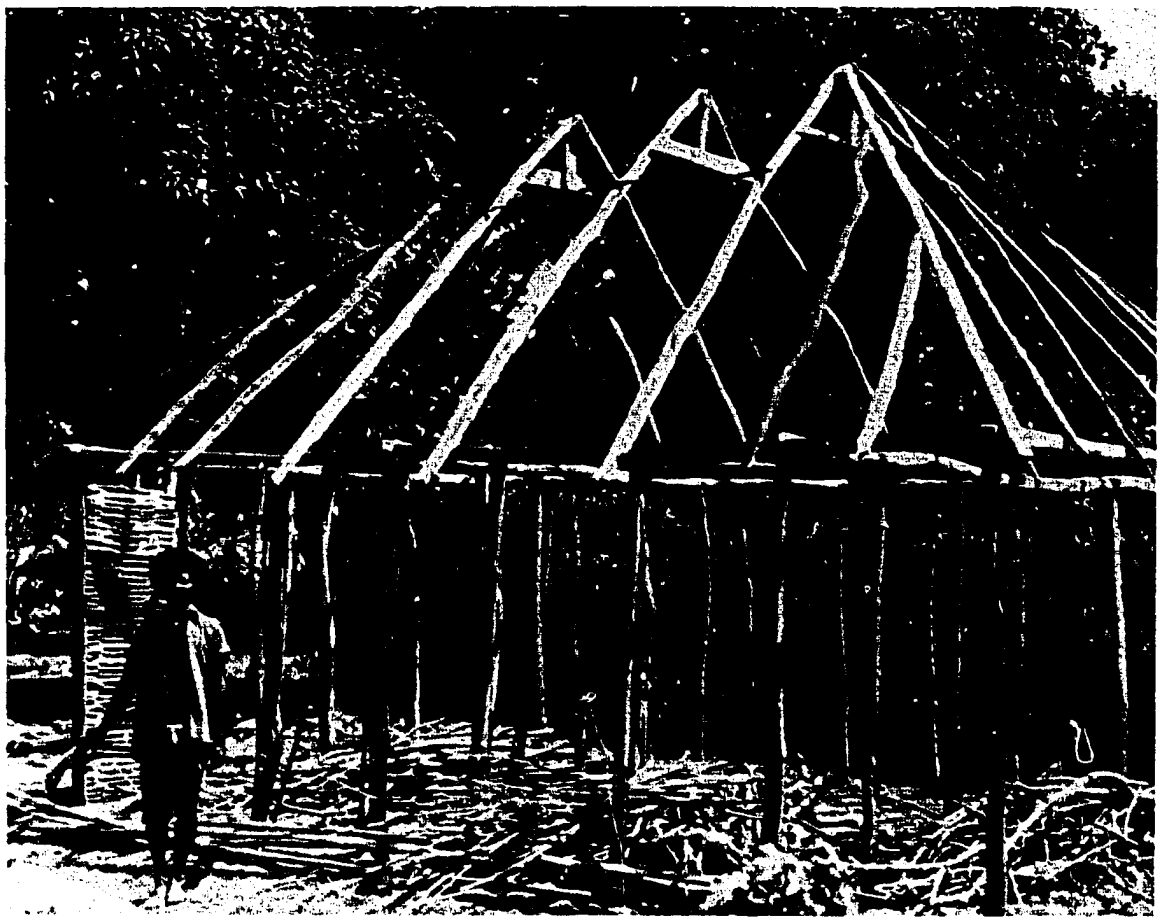
News of the flooding in the southern peninsula reached Port-au-Prince quickly. USAID and Embassy staff monitored the situation, informing OFDA of the evolving crisis. On June 4, 1986, U.S. Ambassador Clayton E. McManaway, Jr., declared that the flooding in the Les Cayes area constituted a disaster. On June 11, a check for $25,000 was presented to the director of the Haitian Red Cross for the immediate relief of the flood victims. The funds were used by the HRC to purchase beds, mattresses, and household utensils for the homeless of the Les Cayes area.

In support of the OPDES-coordinated agricultural rehabilitation project to restore flood-damaged land to cultivation, the U.S. requested OFDA to supply much needed hand tools to enable the project to begin before the September/October planting season. In response, OFDA identified a quantity of tools available from its regional stockpile in Panama and provided a grant to the U.S. Mission to procure additional tools locally.

A major problem affecting both immediate disaster relief and longer-term recovery effects was the fact that the principal bridge spanning the Torbeck River and providing access to the entire southwestern region was unusable. Severely weakened by the flooding and heavy rains, the Torbeck River bridge finally collapsed.

OFDA was requested to procure the necessary replacement parts and erection equipment to repair the two lane Acrow panel bridge. An AID-funded host country personal services contractor at the Ministry of Public Works was identified as having appropriate experience and was detailed to work on the bridge repairs.

Equipment provided by OFDA was procured from Acrow Corporation of America at a total cost of $93,731 and included panels, bracing frame trusses, chord bolts and reinforcements, clips, bolts, pins, and lights. Erection tools included wrenches, pliers, ring spanners, hydraulic jacks, and jack shoes. This equipment, transported from Philadelphia to Port-au-Prince via Arrow Airways on a DC-8, arrived in Port-au-Prince on August 18, cleared customs, and was delivered to the bridge site. Reconstruction efforts began immediately, and the GOH was able to launch the new bridge on September 9.



Housing reconstruction training program

Recognizing both the need to repair or replace damaged homes and the opportunity to improve housing construction techniques, the U.S. Mission encouraged OPDES to design a policy for housing reconstruction in the Les Cayes area. Mission staff worked closely with OPDES, HAVA, Pan Caribbean Disaster Preparedness and Planning Project staff, the Center for Human Resource Development (CHRD), and an UNDRO consultant to help OPDES elaborate a policy and a plan for housing reconstruction. The result of these collective efforts was a two-phase plan in which local builders would be trained in improved construction techniques and a pilot reconstruction project would be implemented in Cavaillon in Phase I. Phase II encompassed the reconstruction of damaged housing throughout the affected area. The U.S. Mission requested OFDA funding for the Phase I effort, totaling $11,894.

As part of Phase I activities, the regional OPDES subcommittee on housing met with local leaders to select one house builder from each of the 18 affected communes to participate in a pre-training conference. CHRD organized and executed the one-day pre-training conference in Port-au-Prince in order to achieve consensus among the builders that the recommended construction techniques (developed in 1984 by INTERTECT with OFDA funding) were superior, affordable, and acceptable. CHRD, using the INTERTECT study and results of the pre-training conference, developed training materials, including booklets with sketches and illustrations and captions in Creole, for 18 community workshops. Forty participants were expected at each workshop. Posters, models, and samples of critical housing elements such as joints, foundation anchoring, and bracing and roofing techniques were prepared and distributed to each community.

Summary of USG Assistance

Ambassador's Authority to Haitian Red Cross $25,000

Bridge parts $93,731

Transport of bridge parts $366,909

Mission allotment for housing training program $11,894

Hand tools from Panama stockpile (value not included in total) ..... ($8,300)

Transport of hand tools from Panama to Haiti via ocean freight $1,326

Mission allotment for local purchase of additional hand tools $41,923

TOTAL $210,783

Assistance Provided by U.S. Voluntary Agencies

ADRA — ADRA officials visited affected area and established committees among respected members of the community to identify families needing food assistance and having at least one child under age five. Ration cards were distributed to a total of 100 families who then received SFCM, NFDM, and vegoil.

World Concern of Seattle — supplied medical supplies from in-country stocks consisting of 19,000 doses of antibiotics, 4,000 doses of water purification tablets, cough syrup, syringes, dressing, tylenol, disinfectant, antiseptics, intravenous fluids, 10 bales of blankets, and 10 bales of clothing. In addition, 200,000 analgesic tablets and 32,000 doses of upper respiratory medication were delivered from out-of-country stocks. All these supplies were turned over to the Ministry of Public Health in Port-au-Prince for transport and distribution to the residents of the Les Cayes area.

Assistance Provided by the International Community

International Organizations

PCDPP — dispatched UNDRO housing specialist Al Wason from Antigua to Haiti in response to a request from OPDES, to assist GOH in developing a housing reconstruction plan involving both the GOH and local PVOs.

UNDRO — launched an international appeal for assistance to restore rural infrastructure destroyed by the floods and contributed $18,212 in cash. Project implementation, initiated in October 1986, was arranged through OPDES with technical assistance provided by an UNDRO delegate made available by the Swiss Government. Also provided contract services of telecommunications specialist Pierre Catala to assist OPDES in emergency communications.

Governments

Germany, Fed. Rep. — The Foreign Assistance Agency (GTZ) dispatched chemicals to Les Cayes for use in disinfecting the town water system, value not reported.

Japan — contributed $100,000 to the Ministry of Public Health for disaster relief/rehabilitation.

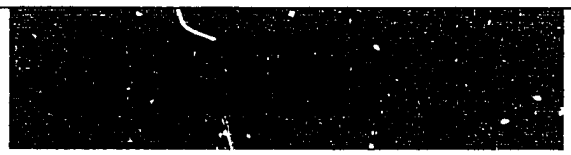
Netherlands — contributed $227,272 through UNDRO to support recovery projects.

Switzerland — provided $145,000 through UNDRO to support recovery projects; $15,151 to procure a project vehicle; and 7.5 man/months of technical assistance valued at $55,000.

United Kingdom — donated $61,622 through UNDRO.

TOTAL $622,257

Floods



Date:
May-June 1986

Location:
Island-wide; parishes of Westmoreland, Clarendon, and St. Catherine

No. Dead:
54

No. Affected:
at least 40,000

Damage:
8,320 ha of agricultural cropland flooded, including 2,430 ha in Clarendon, 1,900 ha in St. Elizabeth, and 640 ha in Manchester. Preliminary estimates of total damage: $76 million, including agricultural losses of $30.4 million and damage to public utilities (telephone, electrical, railroad, and water systems) totaling $1.6 million.

The Disaster

For months before the May-June deluge, high levels of rainfall had drenched Jamaica. Hurricane Kate had caused island-wide flooding in November 1985 and unusually heavy precipitation had continued throughout the winter months. Beginning in mid-May, Jamaica was again drenched by steady rains and isolated thunderstorms. From May 15 to June 5, 2,616 mm of rain soaked the island. An analysis of the rainfall data demonstrates that May-June rainfall levels were at least three times the normal levels for most stations. The saturated condition of the soil and the uninterrupted downpours combined to produce disastrous consequences.

Continuous rains precipitated severe flooding along all river banks in the southern part of Jamaica. At its peak, the flooding forced many people from their homes and marooned thousands. Flood waters eroded bridge supports and approaches, rendering at least seven essential bridges impassable to vehicular traffic. In all, 341 roads and 15 bridges were damaged or obstructed. The Jamaica Railway Corporation temporarily suspended service to selected areas where railway lines had been washed away or tracks blocked by landslides. The Rio Minho, which at the height of its current flowed at an estimated 2,800 cubic meters per second, caused the most devastating damage, inundating towns, crop lands, and factories in Clarendon Parish.

Jamaica's agricultural sector suffered extreme damage. The most devastated areas were Clarendon, St. Elizabeth, and Manchester. Produce for domestic consumption, such as red peas, onions, and corn, suffered heavy losses. Downpours uprooted plantings on slopes while crops on level land were spoiled by pooling rainwater. The Jamaica Livestock Association reported livestock losses reaching $1.5 million. Flooding of aquaculture ponds resulted in a significant loss of fish. In addition, agricultural infrastructure, such as farm buildings, equipment, and roads, was also destroyed.

Damage to local water supply systems was widespread; about 219,500 people were affected by a lack of potable water. Water contamination and sewer disruption in eight parishes necessitated repair and decontamination efforts. The possibility of water-borne diseases further threatened the flood victims. Other utilities (power supply, transport, telecommunications) were affected to varying degrees. Most parishes were without electrical power until June 14. On the entire island, 14 hospitals, 12 health centers, and four parish health offices reported damage, estimated at $3.5 million.

From May 25 to June 5, the capital city of Kingston recorded approximately 764 mm of rain. The main gully courses within Kingston had been cleaned recently, preventing more serious flooding in downtown Kingston. The Hope River Bridge — the main artery feeding into Kingston from the eastern end of the island — experienced critical structural damage when the footing of a pier supporting a section of the 76-m bridge eroded.

Action Taken by the Government of Jamaica (GOJ) and Non-Governmental Organizations

Prime Minister Edward Seaga convened the National Disaster Committee to manage and coordinate relief and rehabilitation efforts. The Office of Disaster Preparedness and Relief Coordination (ODP) handled the mechanics of the GOJ relief response, in cooperation with local disaster committees. The ODP convened daily meetings of pertinent GOJ officials and local voluntary agency representatives to report situation updates, establish priorities, validate needs, and adjust response plans accordingly.

In a unified effort, the various entities of the GOJ responded to the situation. The Ministry of Construction and Public Works supplied vehicles and heavy equipment for road and bridge clearance and repairs; 1,100 of its employees were engaged in rehabilitation activities. Disaster victims received food, clothing, and bedding distributed by the Ministry of Social Security, assisted by Poor Relief officials. At the height of the disaster, more than 6,390 persons were lodged in 20 temporary shelters throughout the island with many of these people receiving food provided by the Ministry of Education. A feeding program for more than 40,000 people was a major GOJ relief undertaking.

The Jamaica Constabulary Force maintained security and the Jamaican Defence Force (JDF) provided air and ground support to the relief

effort. The JDF established an operational headquarters in the hardest hit area of Clarendon and assisted in coordinating local relief. The Jamaican Red Cross (JRC) and the Salvation Army distributed food to those in need. The JRC received local donations in cash and food from the GOJ, the National Commercial Bank, and private sector sources.

Prime Minister Seaga visited the most severely affected areas, offering encouragement and support to the flood victims. The Prime Minister also designated June 18 as a day of national rehabilitation. On this day, Jamaican citizens voluntarily contributed their time and effort to assist in cooperative rehabilitation endeavors. The day was heralded as a grand success, with extensive popular participation.

Assistance Provided by the United States Government

In response to a request from Prime Minister Edward Seaga, U.S. Ambassador Michael Sotirhos determined on June 6, 1986, that the floods were of a magnitude to warrant USG assistance. Ambassador Sotirhos granted his $25,000 Ambassador's Authority to the ODP; these funds paid for emergency food supplies. In addition, OFDA dispatched its logistician, Walter Keesecker, to conduct an on-site assessment, provide support to the USAID Mission in Kingston, and help determine any prospective USG response.

OFDA released 2,057 folding cots from its Panama stockpile for use by at least 2,000 people in temporary shelters. Through DOD, a series of five California Air National Guard C-130 flights ferried the cots, valued at $90,508, to the Norman Manley Airport in Kingston; transport costs totaled $25,000. The JDF provided local transport of the cots to distribution points in Westmoreland and southern Clarendon. OFDA also provided 31 rolls of plastic sheeting to be used in constructing temporary protection for damaged GOJ facilities. The plastic sheeting, valued at $8,587 arrived on the last C-130 flight.

Logistician Keesecker surveyed some of the hardest hit areas and participated in relief coordination sessions at the ODP. Short-term emergency needs were identified and met. Long-term reconstruction constituted Jamaica's greatest need; USAID/Kingston reprogrammed $500,000 from its crop diversification and irrigation project grant funds to purchase seeds and planting materials (excluding chemicals and fertilizer) for use by small farmers.

Summary of USG Assistance

Ambassador's Authority	$25,000
2,057 folding aluminum cots (value not included in total)	($90,508)
31 rolls of plastic sheeting	$8,587
C-130 transport costs	$25,000
Travel and expenses of OFDA logistician (operating expenses)	$2,630
USAID/Kingston funds reprogrammed for seeds and planting materials	$500,000
Total OFDA	$61,217
Other USG	$500,000
TOTAL	**$561,217**

Assistance Provided by the International Community

International Organizations

EC — granted $376,300 to be distributed to the most affected families.

FAO — contributed $200,000 worth of agricultural implements; 468 MT of food and technical assistance for 6-10 months, value not reported.

IDB — donated $100,000 to help small farmers recover from personal losses.

UNDP — $50,000

UNDRO — dispatched a delegate to assist in damage assessment and relief coordination; also donated $5,000 for local purchase of chemicals. Contributed $1,200,000 for integrated rural development, including soil conservation, agricultural inputs, and appropriate technology for rebuilding houses.

WHO/PAHO — sent a six-member team to evaluate health situation and medical needs; contributed water supply equipment; total value, $10,000.

Governments

Barbados — supplied 5 swing fogging sprayers for vector control, valued at $5,000.

Canada — donated food and blankets valued at $109,490, including external transport; gave

$32,846 to PAHO for the repair and decontamination of water systems.

France — gave $13,700 for food aid and 400 MT of wheat flour and 1.5 MT of medical supplies; value not reported.

Germany, Fed. Rep. -- disbursed $21,740 for local purchase of relief supplies.

Guyana — provided lumber, utility poles, and 100 MT each of rice and sugar.

Korea, Rep. of — donated $30,000 for food aid.

India — gave an undetermined amount of medical supplies.

Israel — contributed assorted medical supplies, value not reported.

Spain — sent medical supplies valued at $13,800.

United Kingdom — provided 3 Puma helicopters for local transport; a Royal Air Force Hercules aircraft brought in 6 MT of medical supplies and other relief equipment; total value $299,850. The HMS Ariadne berthed at Rocky Point and provided 27.3 MT of fresh water per day for local distribution. Also, a 1985 program loan was increased by $375,150 to cover the cost of a Bailey Bridge.

Non-Governmental Organizations

United Kingdom Red Cross — gave $2,998 to Jamaica Red Cross.

TOTAL $2,845,874

Floods

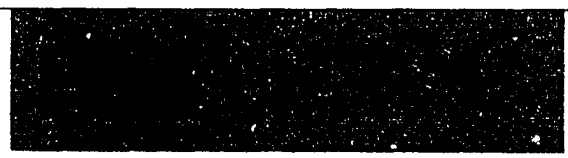
Date:
February-April 1986

Location:
Lowlands surrounding Lake Titicaca and smaller lakes and rivers in the department of Puno; the Ucayali River basin in Ucayali and Loreto Departments; the Ucallaga River basin in the department of Huanuco

No. Dead:
12

No. Affected:
150,000

Damage:
85,000 ha of cultivated land affected countrywide; 15,000 to 25,000 homes damaged or destroyed.



The Disaster

Excessive rainfall over a period of many months caused lakes and rivers to rise to unprecedented levels and flood homes and fields. People living on the shores of Lake Titicaca, a body of water covering more than 7,770 sq. km in both Peru and Bolivia, experienced the full force of flooding. By February Lake Titicaca had risen to 163 cm above normal, its highest level in recorded history, and the rains were still falling. In March Lake Titicaca merged with Lake Arapa, lying to the northwest. The water level of the lake peaked in April but did not begin to recede until June. The floods disrupted thousands of families living near the lake, many of whom had built homes close to the lake during the 1982-83 drought. The city of Puno near Lake Titicaca also experienced flooding, especially in low-lying slum areas.

In addition to flooding around Lake Titicaca, serious flooding occurred along several rivers elsewhere in Puno and in Ucayali and Loreto Departments. The Ucayali River flooded, damaging structures in Contamana.

In the department of Huanaco, the Huallaga River reached its highest level in 20 years and several lakes overflowed. The rains and floods precipitated mudslides which buried three villages, destroyed two bridges, caused considerable crop and livestock losses, and killed twelve people.

Countrywide, an estimated 85,000 ha of cultivated land were affected. Potatoes, quinua, fodder, and barley were the major crops damaged by the water. The most severe agriculture losses occurred in Puno Department where approximately 23,000 ha of crops were destroyed and another 47,000 ha were damaged by standing water. In Puno, the value of lost production was estimated to be over $1.2 million. No estimates for the value of agricultural losses nationwide are available.

Housing in the affected part of Peru is customarily made of adobe which is not water resistant. As the water level rose, the bottom layers of adobe blocks turned to mud, causing entire walls and buildings to collapse. Estimates of the number of houses damaged or destroyed ranged from 15,000 to 25,000. The homeless moved in with relatives or crowded into schoolrooms or temporary shelters. Water and sanitation were disrupted by the floods, especially in Puno where water pumping stations and a sewage treatment plant were damaged.

As the water rose, it also covered roads and railways. The highway connecting the cities of Juliaca and Huancane was flooded, effectively cutting transport to communities on the northern shore of Lake Titicaca. The road between

The Peru side of Desaguadero, a town which straddles the border with Bolivia.

Puno and Desaguadero, Peru's link to Bolivia, was also damaged. Approximately 15 km of railroad between Juliaca and Puno were flooded by about a meter of water. These transportation shutdowns isolated Huancane, the lower part of Puno, and various villages.

At least 200 schoolrooms were inundated; many of those that were not destroyed were used as emergency shelters. This, along with the massive displacement of families and teachers, severely disrupted education in the flooded regions.

Action Taken by the Government of Peru (GOP) and Non-Governmental Organizations

On February 1 the Ministry of the Presidency declared a state of emergency in Huancane, Puno, Chucuito, and Yunguyo due to heavy rains and floods. The declaration allowed 15 million intis (about $861,000) to be applied toward food, medicine, fuel, and other needs. The GOP created a multisectoral commission, comprising representatives from nine ministries, to determine use of these funds and oversee their disbursement. The Ministry of Health monitored the health situation and mounted a vaccination campaign.

The Oficina Nacional de Apoyo Alimentario (ONAA) played a major role as a food distribution agency. It distributed at least 600 MT of food per month through soup kitchens, PVOs, and by direct distribution. As of April 1986, ONAA had 1,600 MT of food stockpiled in Puno and elsewhere, an amount sufficient to last for approximately five months. Since feeding programs were expected to continue for a year, the GOP also requested additional food from the international community.

Civil defense authorities and the military handled shipping and distribution of donated relief supplies once they arrived in-country. Most materials arrived in Lima and were immediately transshipped to Puno by the Peruvian Air Force.

Emergency shelters were established in a number of locations, including schools, public buildings, and even a soccer stadium in Huanaco. The GOP also provided wooden posts to make frames for temporary shelters and assigned two architects to train residents in the use of the materials.

In early February the local Red Cross began to provide services to affected individuals in the city of Puno. They supplied 300 blankets, set up feeding stations, and provided first aid in the shelters that had been opened in the city. Unfortunately, Red Cross activities were terminated after two weeks because of lack of funds.

Assistance Provided by the United States Government

As the situation worsened, it became evident that damage due to flooding and mudslides was extensive. On March 4, U.S. Ambassador David Jordan declared a disaster. The most immediate relief need was shelter for the homeless. In response to a request from the GOP, OFDA agreed to supply 200 rolls of plastic sheeting which could quickly be used to construct temporary shelters. DOD airlifted the sheeting from OFDA's Panama stockpile to Lima aboard a C-141 on March 9. Ten days later, a second shipment of 144 rolls of plastic sheeting was provided and similarly shipped. Fifty rolls were distributed in the Huancane area, ten in the city of Puno, and the rest in communities around Lake Titicaca. OFDA also funded the local purchase of 28,000 m of nylon cord to be used to tie down the plastic sheeting. On average, each shelter constructed from the sheeting served two families. An estimated 14,500 persons, or 12% of the homeless, were sheltered with OFDA-supplied material.

The USG also assisted with emergency food needs. USAID authorized the donation of 425 MT of CSM, 104 MT of wheat, 762 MT of rice, 26 MT of vegoil, and 76 MT of NFDM (a total of 1,393 MT valued at $551,000) from CARE regular program stocks to ONAA/Puno for an emergency feeding program. Food from ADRA/OFASA regular program stocks was also supplied for emergency feeding. This included 1,269 MT of flour, 305 MT of NFDM, 1,096 MT of bulgur and 46 MT of vegoil; a total of 2,716 MT valued at $902,000. Altogether, 4,109 MT of food with a total value of $1,453,000 was donated.

A number of USG disaster experts contributed to the relief effort. On March 9, the A.I.D. regional housing officer (based in Lima) and a Peruvian civil defense architect went to Puno to provide shelter construction assistance. OFDA's Latin American Regional Advisor and a representative from the American Red Cross arrived in Peru on April 6. They put together a detailed damage assessment for the Puno area, identified needs and additional areas of possible USG assistance, and helped define longer-term reconstruction and rehabilitation needs. In addition, the Director of OFDA's Latin America and the Caribbean Division visited Peru to discuss USG contributions to the disaster relief effort.

The extensive damage to agriculture meant that not only was the current crop harvest lost, but also that many people faced the coming planting season without seeds. CARE's regional office in Puno analyzed seed availability in early June and, based on these findings, CARE/Peru requested USAID emergency funds to imple-

ment an emergency potato seed distribution program. The program called for the purchase of 300 MT of potato seed appropriate to that region of Peru to be distributed through seed banks. The project also included the construction of seed storage sheds in order to minimize post-harvest losses. OFDA allocated $166,000 for this project, which paid for seeds, fertilizer, transport, and storage sheds, as well as operating and personnel costs.

Summary of USG Assistance

344 rolls of plastic sheeting from OFDA stockpile in Panama $99,572

DOD airlifts of plastic sheeting $23,000

Local purchase of 28,000 m of braided nylon cord $3,312

Services of ANRC disaster specialist .. $1,365

Grant to PVO for potato seed emergency distribution $166,000

Travel expenses of regional housing officer for 15 days (operating expenses) $700

Travel and administrative expenses of OFDA disaster relief officer (operating expenses) $1,314

Value of 4,109 MT of P.L. 480 Title II commodities $1,453,000

Total OFDA $295,263
Total FFP $1,453,000

TOTAL $1,748,263

Assistance Provided by U.S. Voluntary Agencies

ADRA — released food from regular program stocks to ONAA/Puno for emergency feeding; distributed potato seeds through revolving seed banks in support of CARE's emergency seed program.

CARE — released food from regular program stocks to ONAA/Puno for emergency feeding; implemented an emergency potato seed distribution program with funding from OFDA and other sources.

CWS — provided $5,000 from the Executive Director's emergency fund to the Peruvian Evangelical Social Action Service's relief effort; forwarded 12,000 blankets ($48,000) and 21,000 pieces of clothing ($15,000).

WVRO — sent food, medical supplies, 1,383 blankets, and temporary shelter for 692 families, valued at $112,800.

TOTAL $180,800

Assistance Provided by the International Community

International Organizations

UNDRO — provided $50,000 to WHO/PAHO for local purchase of medical supplies.

WHO/PAHO — conducted a study of the disaster's impact on health and nutrition in the affected area.

Governments

Germany, Fed. Rep. — contributed $64,378 for local purchase of supplies.

Japan — gave $100,000 worth of medicine.

New Zealand — donated $10,000.

United Kingdom — contributed $29,000 through UNDRO and $5,848 through the British Red Cross.

Non-Governmental Organizations

Canada Red Cross — contributed $3,597.

Colombia Red Cross — donated $30,000.

Japan Red Cross — gave $8,333.

MSF — supplied tents and medicines; value not reported.

New Zealand Red Cross — contributed $526.

Norway Red Cross — donated $13,698.

Oxfam — gave $5,780 to civil defense for local purchase of drugs.

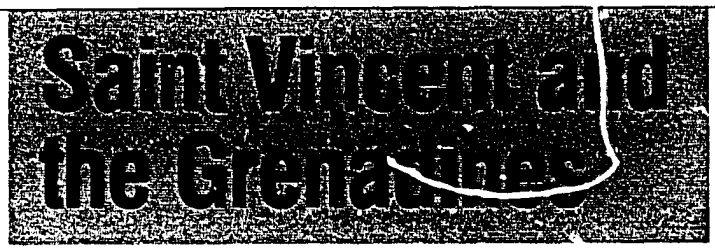
Soviet Union Red Cross — provided 100 tents, 990 blankets, 548 kg of baby food, and 405 kg of medicines; value not reported.

Spain Red Cross — provided 10 hexagon tents, 720 blankets, 4,800 articles of clothing, 296 pairs of boots, 1,000 kg of antibiotics and antidiarrhea medicines, and 1 Zodiac boat with motor; total value $67,629.

Sweden Red Cross — gave 100 family tents and 500 blankets (value $8,867), and a $33,784 cash donation.

TOTAL $431,440

Floods



Date:
September 8-22, 1986

Location:
Chateaubelair

No. Affected:
142 homeless

Damage:
Tropical Storm Danielle and subsequent heavy rains caused serious damage to approximately 200 homes. The water supply system, power generation facility, roads and bridges all sustained varying degrees of damage.

The Disaster

On September 8 St. Vincent and the Grenadines was hit by Tropical Storm Danielle. Barely two weeks later, a prolonged cloudburst dumped 211 mm of rain upon the country over a two-day period. The combination of Danielle and the subsequent torrential rains caused extensive damage to 147 homes and completely destroyed another 63. The twin disasters triggered extensive landslides, disrupting the unreliable water supply system, knocking out the power generation facility, and causing the washout and destruction of roads, bridges, retaining walls, and culvert headwalls. No deaths were associated with the storm, but 10 people sustained serious injuries.

Approximately 40% of the banana crop, which accounts for the large majority of St. Vincent's agricultural exports, was either totally destroyed or seriously damaged. Losses from other crops (vegetable and root) were substantially less, amounting to approximately $500,000, as compared to the $2.19 million expected loss from reduced banana export revenues.

Action Taken by the Government of St. Vincent and The Grenadines (GOSV)

The Central Emergency Relief Committee of the GOSV, headed by the Prime Minister, has the major responsibility for hurricane and volcanic disasters. Under its guidance, the GOSV has developed a disaster relief plan.

The Minister of Housing was in charge of the government's relief program, working in conjunction with the Official Disaster Relief Coordinator, the St. Vincent Red Cross (SVRC), the Ministries of Trade and Agriculture, Communications and Works, and the Chief Engineer. The government assisted self-help housing reconstruction efforts but lacked adequate funds to meet identified needs in this area.

The SVRC established emergency quarters at the Chateaubelair community center. One of six camps established immediately after the storm, the center provided shelter for approximately 35 people each night and meals for 45-50 persons each day.

Assistance Provided by the United States Government

On September 25, the U.S. Embassy received an official request from the GOSV for emergency assistance. After an assessment by the Embassy political officer, Ambassador Carpenter invoked his disaster relief authority and obligated $25,000 for the purchase of first aid supplies ($1,750) and emergency housing materials ($23,250) to be used in a self-help rebuilding program. An on-site damage assessment by a team from the Regional Development Office in the Caribbean (RDO/C) confirmed the need for additional building materials. In response to a request from RDO/C, OFDA provided a further $75,000 on October 16 for the local purchase of the needed supplies.

Total FY 1986	$25,000
Total FY 1987	$75,000
TOTAL	**$100,000**

Assistance Provided by U.S. Voluntary Agencies

ANRC — provided unspecified relief supplies.

Assistance Provided by the International Community

PAHO — provided oral rehydration salts, value not reported.

UNDP — donated $30,000 for the emergency housing effort. A U.N. engineer assigned to the Central Planning Unit of the Ministry of Finance coordinated the rebuilding effort.

TOTAL $30,000