



DISASTER CASE REPORT

Agency for
International
Development

Washington D.C.
20523

CHAD - Rat Infestation

The Disaster

Rodent irruptions have been an age-old problem in the Sahelian region of Africa. Rats tend to increase in the aftermath of drought when environmental recovery creates a new abundance of food, water, and shelter. Chad's rat infestation reached alarming proportions by April 1987. The Government of Chad's Ministry of Agriculture reported infestation rates of between 10 and 40 percent in five Sahelian prefectures surveyed. Although the Sahelian zone seemed to be the most severely affected, rodent sightings emanated from all of the country's 14 prefectures.

Initially, Gerbillus gerbillus and Jaculus jaculus were the primary rodents reported in the rat outbreak in Chad. Later, Mastomys were also sighted in significant numbers. Rats caused severe damage to 1986 crops, including groundnuts, vegetables, millet, and sorghum. During the dry season, recessionary sorghum and vegetable gardens came under rodent attack, leaving onions and tomatoes significantly marred. Jaculus and Gerbillus consumed or cached millet and sorghum seeds right after planting, forcing farmers to reseed some fields as many as three times. Farmers would dig up stashes of buried seeds and then replant them.

Rodent populations were anticipated to peak in 1987 before declining to normal levels in one or two years. Although many factors such as drought or rat disease could alter predicted trends, the potential exists for severe rodent-induced damage during the 1987-88 and 1988-89 cropping cycles. The resulting loss of cereal production in the Sahelian zone could ultimately lead to critical food shortages in Chad.

Action Taken by the Government of Chad (GOC)

After reports of the rat irruption reached the GOC, the Ministry of Agriculture's Plant Protection Division (PPD) conducted testing in several prefectures and determined that the infestation was extremely serious. Test results prompted the GOC to request USG assistance, since

the PPD lacked the necessary resources, training, and logistical support to manage a large-scale pest control campaign. The Ministry of Agriculture and a technician from the Denver Wildlife Research Center (DWRC) developed a plan of action and supervised the pre-mixing of rat bait.

Assistance Provided by the United States Government

A.I.D.'s Africa Bureau sponsored G. Keith LaVoie from DWRC to go to Chad and assess the seriousness of the reported rat outbreak. During his two-week stay from May 9 to May 24, Mr. LaVoie confirmed the severity of the rat infestation and recommended the use of rodenticides, including zinc phosphide, which is an acute rodenticide. However, the Africa Bureau and OFDA preferred not to proceed with a rat control program based on zinc phosphide because of its toxicity and the risks to people and other non-target groups, given the Chadian setting.

On June 30, 1987, U.S. Ambassador [redacted] declared the Chad rat infestation a potential disaster of sufficient magnitude to warrant USG assistance. To comply with USG environmental concerns, a rodent control program based on the use of warfarin was proposed. Unlike zinc phosphide, warfarin is an anti-coagulant which does not kill the rodents with one treatment; multiple feedings are necessary. In acknowledgement of the Ambassador's declaration, OFDA concurred with the essence of the proposed program, but the initial plan underwent various revisions before its implementation.

The Regional Environmental Officer (REO) in Abidjan who was already familiar with the Chadian biophysical environment, drafted the Initial Environmental Exam (IEE) required by A.I.D. and the U.S. Environmental Protection Agency. The IEE endorsed the proposed plan of action concluding that warfarin would not result in adverse consequences for the environment, provided that there were effective measures for control of distribution and storage, training of users and applicators, and monitoring of the use and effectiveness of the rodenticide.

The Mission decided to conduct a trial program in 1987 to test the proposed rat control measures. It had become clear that by the time the warfarin was procured, shipped, delivered up-country, formulated, and made available to the farmers the agricultural cycle would have already run its course. Thus, 400 kg of warfarin were shipped to treat approximately 1,000 ha of affected land. Two hundred boxes of vitamin K and 26,800 milk cartons were shipped from the United States. The vitamin K was provided as a contingency antidote to the warfarin and the milk cartons were made into bait stations.

OFDA contracted a technician from DWRC who went to Chad at the beginning of October to help in the planning and implementation of the rat control test program.

By December 1987, reports from the field informed OFDA that warfarin, when used properly, is effective for rat control in the Chadian setting. After warfarin bait was formulated, bags of bait were distributed to the test sites at N'djamena, Mao, Bokoro, Abeche, and Abougoudam. A total of 130 ha was treated in the prefectures of Chari-Baguirmi, Ouaddai, and Kanem. The tests were aimed at Mastomys, the rat species which posed a significant threat to vegetable crops and recessional sorghum. Following a two-week warfarin baiting program, significant reductions of Mastomys, as well as Gerbillus and Jaculus, were noted at all test sites.

Sixty-one extension CPS agents were trained in bait formulation, application, and evaluation of the rodent control program. Agents and farmers at all test sites expressed satisfaction with the use of warfarin, noting its efficacy and ease of application.

Summary of USG Assistance

FY 1987

Labor costs for bait formulation.....	\$1,000
Local purchase of materials (barrels, bags, dye etc.) for baiting.....	\$1,000
Local purchase of grain for baiting.....	\$2,000
Local purchase of vegoil for baiting.....	\$200
In-country transport costs.....	\$1,050
Training (including materials and in-country travel).....	\$5,000
26,800 milk cartons purchased from International Paper Co., plus air freight.....	\$7,626
435.46 kg (960 lbs.) of 0.5% warfarin concentrate purchased from Bell Laboratory.....	\$912
Air freight of warfarin.....	\$3,791
80 packages of 6 1-cc vials of vitamin K purchased from DOD, plus air freight.....	\$936
Total FY 1987.....	\$23,515

FY 1988

Cost of DWRC expert Clay Mitchell's assistance with imple-
mentation of pest control programs.....\$9,195

Total FY 1988.....\$9,195

TOTAL.....\$32,710

Assistance Provided by U.S. Voluntary Agencies

None reported

Assistance Provided by the International Community

None reported