



Report to the Chairwoman, Committee
on Agriculture, Nutrition, and Forestry,
U.S. Senate

March 2014

INTERNATIONAL FOOD AID

Prepositioning
Speeds Delivery of
Emergency Aid, but
Additional Monitoring
of Time Frames and
Costs Is Needed

GAO Highlights

Highlights of [GAO-14-277](#), a report to the Chairwoman, Committee on Agriculture, Nutrition, and Forestry, U.S. Senate

Why GAO Did This Study

Through Title II of the Food for Peace Act, the United States provides U.S. agricultural commodities to meet emergency food needs in foreign countries. In fiscal years 2007 to 2012, USAID delivered \$9.2 billion in emergency food aid to recipient countries through cooperating sponsors. In 2000, Congress authorized USAID to order, transport, and store food for prepositioning in both overseas and domestic locations. Through prepositioning, the agency orders food before it is requested and stores it in warehouses in or near regions with historically high needs.

GAO was asked to examine U.S. international food aid procurement. This report examines (1) the effects of prepositioning on emergency food aid delivery time frames, (2) the effects of prepositioning on the costs of the food aid, and (3) the extent to which the agency monitors prepositioning to maximize time savings and cost effectiveness. GAO analyzed data on delivery time frames and costs; reviewed agency documents; and interviewed agency officials and representatives from WFP, other cooperating sponsors, and ocean freight contractors.

What GAO Recommends

GAO recommends that USAID systematically collect, and ensure the reliability of, data for prepositioned food aid and systematically monitor and assess the effectiveness of food aid's delivery time frames and costs. USAID concurred with the recommendations and is working to improve both the collection of reliable data and its monitoring of prepositioning.

View [GAO-14-277](#). For more information, contact Thomas Melito at (202) 512-9601 or MelitoT@gao.gov.

March 2014

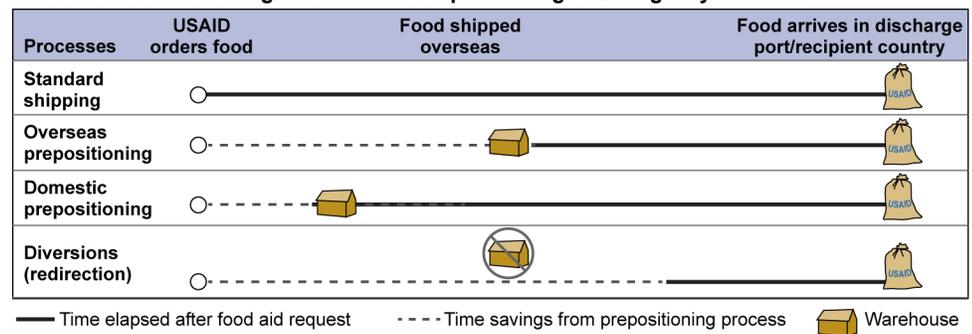
INTERNATIONAL FOOD AID

Prepositioning Speeds Delivery of Emergency Aid, but Additional Monitoring of Time Frames and Costs Is Needed

What GAO Found

The U.S. Agency for International Development (USAID) reduces the average delivery time frame for emergency food aid by prepositioning food domestically—that is, in warehouses in the United States—and overseas. GAO estimates that compared with USAID's standard shipping process, which can take several months, prepositioning food aid shortened delivery time frames by an average of almost a month for shipments to the World Food Program (WFP). GAO also estimates that prepositioning shortened delivery time frames by an average of more than 2 months for other organizations—"cooperating sponsors"—that receive USAID grants. In addition, USAID reduces delivery time frames when it diverts shipments en route to overseas prepositioning warehouses to areas with immediate needs. For all cooperating sponsors, GAO estimates that diversions saved, on average, about 2 months.

Illustration of Time Savings from USAID Prepositioning of Emergency Food Aid



Source: GAO analysis of U.S. Agency for International Development (USAID) data.

Note: For illustrative purposes; not drawn to scale.

Prepositioning food can increase the cost of emergency food aid because of additional warehouse, shipping, and commodity costs. For example, in fiscal year 2012, USAID paid approximately \$8 million for its overseas and domestic prepositioning warehouses. USAID also paid \$13 million to ship food by ocean freight from overseas prepositioning warehouses to recipient countries, in addition to the cost of shipping from the United States to the warehouses. Further, USAID generally paid higher weighted annual average prices for domestically prepositioned commodities than for standard shipment commodities. U.S. officials and vendors noted that factors such as limited commodity supplies and few participating suppliers may have contributed to higher prices.

USAID has taken some steps to evaluate prepositioning, but the agency does not collect and analyze data needed to systematically monitor delivery time frames for prepositioned commodities. In addition, some available data are unreliable. Further, USAID does not systematically monitor the total cost of prepositioning. According to USAID policy and federal internal control standards, the agency should monitor its programs by collecting and analyzing data to guide higher-level decision making and allocate resources. Without such monitoring, USAID is limited in its ability to assess prepositioning's impact on delivery time frames and costs and to maximize emergency food aid's timeliness and cost effectiveness.

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Abbreviations

Title II	Title II of the Food for Peace Act
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
USDA	U.S. Department of Agriculture
WFP	United Nations World Food Program

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March 5, 2014

The Honorable Debbie Stabenow
Chairwoman
Committee on Agriculture, Nutrition, and Forestry
United States Senate

Dear Madam Chairwoman:

U.S. international emergency food aid assists nations affected by severe ongoing crises, such as the long-term food shortage in Ethiopia, as well as unanticipated crises, such as the 2010 earthquake in Haiti. In fiscal years 2007 to 2012, the United States donated about \$9.2 billion in emergency food aid to recipient countries under Title II of the Food for Peace Act (Title II).¹ The U.S. Agency for International Development's (USAID) Office of Food for Peace, which is responsible for managing the U.S. emergency food aid program, delivers this assistance through cooperating sponsors such as the World Food Program (WFP), Catholic Relief Services, and Save the Children.² In 2005, to expedite the delivery of emergency food aid, USAID began to stockpile, or preposition, food commodities, such as lentils, peas, and vegetable oil, in or near regions of the world with historically high emergency food needs. From 2007 to 2012, USAID increased the tonnage of commodities that it ordered for prepositioning under Title II from 6 percent to 22 percent of all emergency food aid commodities. To address immediate needs, USAID can also redirect, or divert, commodities intended for prepositioning and ship them directly to areas in crisis.

In 2000, Congress authorized USAID to order, transport, and store food for prepositioning in the United States and in foreign countries.³ Since

¹See 7 U.S.C. § 1721 *et seq.* Section 3001 of Pub L. No. 110-246, the Food, Conservation, and Energy Act of 2008, renamed the underlying legislation, the Agricultural Trade Development Aid Act of 1954 (also known as P.L. 480), as the Food for Peace Act.

²Cooperating sponsors are organizations that have received USAID grants for delivery of emergency food aid to recipient countries. Shipments of cooperating sponsors' emergency food aid are tracked by freight forwarders—contractors that manage the supply chain of these shipments.

³Pub. L. No. 106-472, §310(b).

2008, Congress has authorized up to \$10 million annually for storage of food in overseas prepositioning sites.⁴ The Farm Bill signed by the President in February 2014 increased the authorization for overseas prepositioning storage costs to \$15 million annually.⁵ For this report, you asked us to assess several issues related to U.S. international food aid procurement. This report examines the (1) effects of USAID's prepositioning on delivery time frames for emergency food aid shipments,⁶ (2) the effects of prepositioning on the costs of emergency food aid, and (3) the extent to which the agency monitors prepositioning to maximize time savings and cost effectiveness.

To determine the effects of USAID's prepositioning on the delivery time frames and costs of emergency food aid, we analyzed data for 3,785 emergency food aid shipments in fiscal years 2007 through 2012.⁷ We used characteristics such as commodity type, month and year the commodity was requested, and discharge port to control for the differences between standard and prepositioned emergency food aid shipments. We conducted separate analyses, and present separate findings, on the effects of prepositioning for WFP and the other cooperating sponsors because of differences in time periods and shipment dates tracked.⁸ We also analyzed cost data related to emergency food shipments in fiscal years 2007 through 2012. To determine the extent to which USAID has monitored prepositioning, we reviewed agency documents to assess whether USAID's monitoring was consistent with its policy and regulations. We interviewed officials of U.S. agencies, WFP and one other cooperating sponsor, and freight

⁴The Food Conservation and Energy Act of 2008, Pub. L. No. 110-246, increased the authorized level of funding for overseas storage from \$2 million to \$10 million

⁵Pub. L. No. 113-79, §3009.

⁶We calculated delivery time frames as the number of days between a cooperating sponsor's request for emergency food aid commodities and the commodities' arrival at the discharge port or in the recipient country. We chose the request for food as the starting point for delivery time frames because the goal of prepositioning is to expedite the delivery of requested emergency food aid.

⁷We collected data for 5,142 emergency food aid shipments and analyzed data for 3,785 (74 percent) of these shipments. Our analysis excludes data for the remaining shipments because of a number of data limitations (see app. II). Our estimates are not representative of the shipments not included in our analysis.

⁸See appendix II for full description of our methodology and results.

forwarders—contractors that manage the supply chain of emergency food aid for USAID and its cooperating sponsors—in Washington, D.C. Appendixes I through IV contain additional information on our scope and methodology.

We conducted this performance audit from July 2013 to March 2014 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

To respond to food aid emergencies, USAID can provide emergency food aid commodities through four general delivery processes: standard shipping, overseas prepositioning, domestic prepositioning, or diversion (see fig. 1).⁹ USAID determines the most appropriate of these four processes by analyzing the request for food aid, the nature of the emergency, and the availability of commodities and resources. USAID aims to maintain a combined total of up to 100,000 metric tons of food in its prepositioning supply chain at any given time.¹⁰ USAID currently maintains prepositioning warehouses in six overseas locations (Colombo, Sri Lanka; Djibouti, Djibouti; Dubai, United Arab Emirates; Durban, South

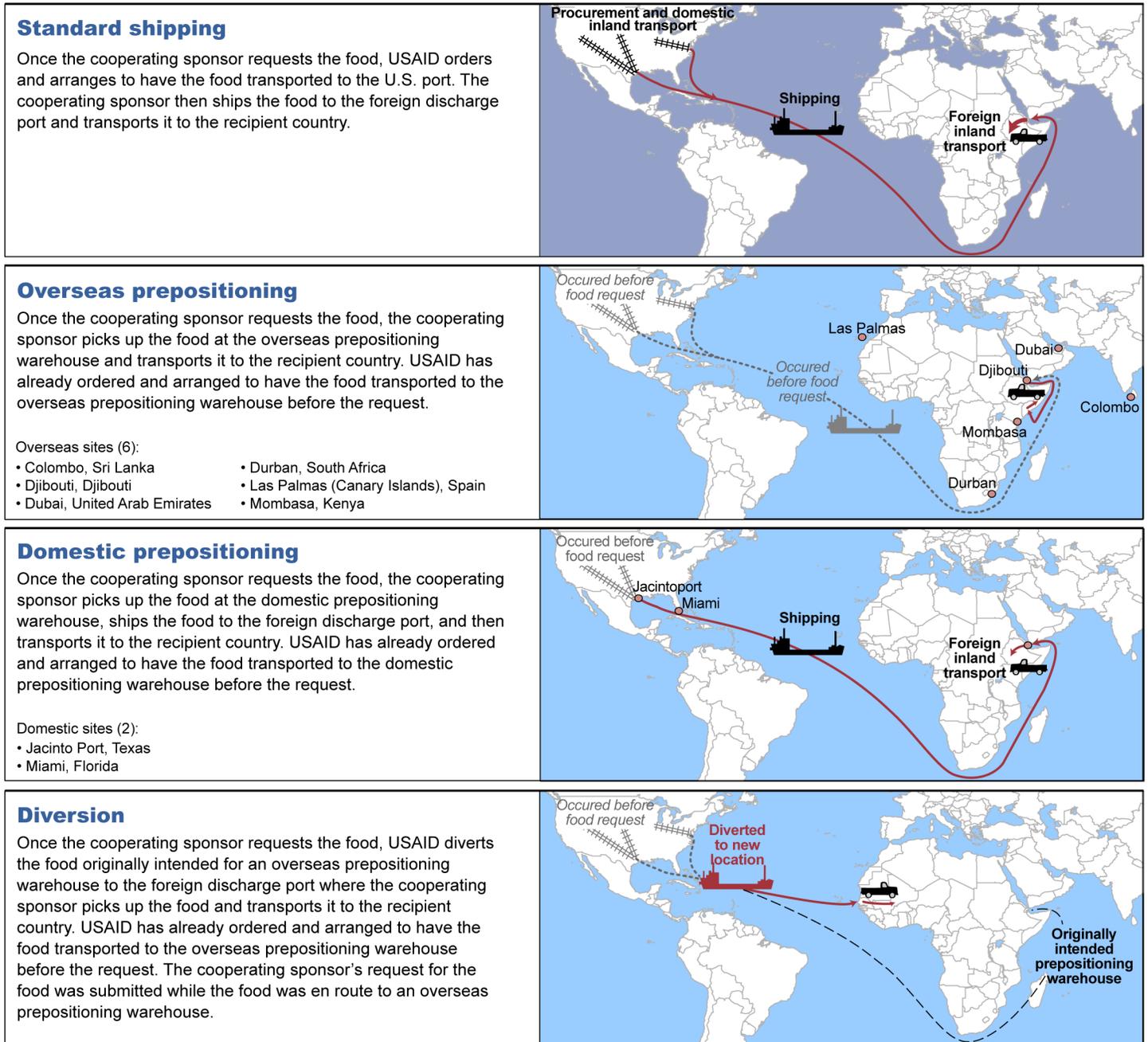
⁹In the food aid community, “diversion” generally refers to loss or theft of food aid. However, USAID and cooperating sponsors also use “diversion” to refer to the redirection of food aid from some stage of the prepositioning process to a foreign port to meet immediate needs. In this report, “diversion” has the latter meaning.

¹⁰According to USAID, the agency varies the inventory of each warehouse throughout the year to align prepositioned food aid with anticipated program needs, availability of funding, and warehouse space.

Africa; Las Palmas, Spain; and Mombasa, Kenya) and two domestic locations (Jacinto Port, Texas, and Miami, Florida).¹¹

¹¹Two of USAID's current prepositioning warehouses—in Dubai, United Arab Emirates, and Miami, Florida—were opened in 2013. According to USAID, these two warehouses are used only to preposition specialized emergency food products and are managed separately from USAID's other prepositioning warehouses. Since the scope of our review is 2007 through 2012, we did not include the Dubai and Miami warehouses in our analysis. Before 2013, USAID also operated prepositioning warehouses in Lake Charles, Louisiana, and Lomé, Togo, but the agency no longer uses these warehouses for prepositioning. Because data were available for the Lomé warehouse, we included these data in our analysis. Data were not available for the Lake Charles warehouse, which closed in 2007. Jacinto Port is located in Houston, Texas.

Figure 1: USAID Processes for Delivering Emergency Food Aid



Source: GAO analysis; Map Resources (map).

Notes: The descriptions shown for each stage of the process are illustrative examples and do not reflect all emergency food aid shipments. For instance, diversions can occur at any point in the procurement, transportation, and shipping process.

USAID's two domestic warehouses are in Jacinto Port, Texas, and Miami, Florida.

USAID's six overseas warehouses are in Colombo, Sri Lanka; Dubai, United Arab Emirates; Durban, South Africa; Djibouti, Djibouti; Las Palmas (Canary Islands), Spain; and Mombasa, Kenya. Before 2013, USAID also had prepositioning warehouses in Lake Charles, Louisiana, and Lomé, Togo; the agency stopped using these warehouses for prepositioning in 2007 and 2012, respectively.

In 2007, we reported that U.S. food aid delivery is generally too time consuming to be sufficiently responsive in emergencies, requiring 4 to 6 months on average, including time required for procurement and transportation of the commodities.¹² We recommended, among other things, that USAID conduct a cost-benefit analysis of prepositioning to improve its food aid logistical planning. In 2008, USAID commissioned a cost-benefit analysis of the U.S. government's food prepositioning activities. The commissioned analysis did not compare the timeliness of domestic and overseas prepositioning; however, it recommended that USAID consider increasing the amount of food aid prepositioned domestically, to improve its response times to critical emergency program needs.¹³ In 2013, a report by USAID's Inspector General found that the agency had not determined whether the benefits of overseas prepositioning in the Horn of Africa outweighed the costs or whether overseas prepositioning saved time in comparison with domestic prepositioning.¹⁴

¹²GAO, *Foreign Assistance: Various Challenges Impede the Efficiency and Effectiveness of U.S. Food Aid*, [GAO-07-560](#) (Washington, D.C.: Apr. 13, 2007).

¹³Janet R. van der Vaart, *P.L. 480 Title II Pre-positioning Cost/Benefit Analysis* (2008).

¹⁴U.S. Agency for International Development, Office of Inspector General, *Audit of USAID's Internal Controls Over Prepositioned Food Assistance for the Horn of Africa*, Audit Report No. 4-962-13-004-P (Jan. 7, 2013).

USAID's Prepositioning of Emergency Food Aid Shortens Delivery Time Frames

Prepositioning of emergency food aid reduces the average delivery time frame for USAID's food aid shipments for WFP and other cooperating sponsors.¹⁵ For WFP, prepositioning food aid in overseas and domestic warehouses shortened delivery time frames by an average of almost a month. For nine of USAID's other cooperating sponsors, prepositioning food aid in domestic and overseas warehouses shortened delivery time frames by an average of more than 2 months.¹⁶ In addition, diversion of emergency food aid from the prepositioning process shortened delivery time frames by, on average, about 2 months for WFP and the other sponsors.¹⁷

For WFP, Prepositioning Emergency Food Aid Shortened Average Delivery Time Frame by Almost a Month

We estimated, using statistical modeling to control for various factors, that prepositioning food in overseas and domestic warehouses shortened the average delivery time frame for shipments for WFP by 28 days in fiscal years 2009 through 2012 compared with USAID's standard shipping process. As table 1 shows, during this period, the 472 prepositioned shipments for WFP had an average delivery time frame of about 102 days. In contrast, the 1,665 standard shipments for WFP had an average delivery time frame of 135 days.¹⁸ According to WFP officials, USAID's

¹⁵We conducted analyses, and discuss our findings, of delivery time frames for USAID food aid shipments for WFP and nine other cooperating sponsors separately because the two groups of data differ in the time periods covered and in their treatment of food aid diversions.

¹⁶The nine cooperating sponsors are CARE, Catholic Relief Services, the government of Pakistan, Norwegian People's Aid, Relief Society of Tigray, SHARE Guatemala, Save the Children, Save the Children—United Kingdom, and the United Nations Children's Fund (UNICEF). Shipment data for these nine cooperating sponsors are collected and tracked by three freight forwarders. We collected shipment data for additional cooperating sponsors from three other freight forwarders; however, we did not find these data to be sufficiently reliable for our purposes and did not include them in our analysis. See appendixes I and II for a detailed discussion of our methodology and results.

¹⁷Our estimate of delivery time frames of diverted shipments for WFP and other cooperating sponsors uses data obtained primarily from a single freight forwarder. These data do not display the differences we identified between the data for WFP and the data for the other cooperating sponsors. We found these data to be reliable for estimating the effect of emergency food aid diversions on delivery time frames for both WFP and the other sponsors. See appendixes I and II for a detailed discussion of our methodology and results.

¹⁸We used regression analysis to estimate the number of days saved, controlling for various factors such as commodity type and discharge port. As a result, the numbers of days saved does not equal the difference between the average delivery time frames.

prepositioning of food in warehouses has helped WFP provide food aid more quickly. WFP officials also stated that because prepositioned food is available for immediate collection from warehouses, prepositioning helps ensure a sufficient food aid supply to meet spikes in demands due to unforeseen emergencies.¹⁹

Table 1: Estimated Days Saved by USAID’s Prepositioning of Emergency Food Aid for the World Food Program, Compared with Standard Shipping, Fiscal Years 2009- 2012

	Number of days saved (regression results)	Margin of error at 95 percent confidence (days)	Average delivery time frame (days)	Number of shipments
Standard shipping	-	-	135	1,665
All prepositioning	28^a	15	102	472
Overseas prepositioning	41^a	17	92	262
Domestic prepositioning	16^b	17	114	210

Source: GAO analysis of World Food Program (WFP) data.

Notes:

For all prepositioning, overseas prepositioning, and domestic prepositioning, we used regression analysis to estimate the number of days saved, controlling for various factors such as commodity type and discharge port. As a result, the numbers of days saved do not equal the differences between average delivery time frames. For example, the number of days saved for all prepositioning is 28 days, but the difference between average delivery time frames for standard shipping and all prepositioning is 33 days.

Delivery time frames begin with WFP and USAID’s signing a grant agreement and end with the delivery of the food aid at the discharge port.

Data provided by WFP do not distinguish diversions from other types of shipments.

^aThe coefficient is statistically significant at the 0.01 level; that is, there is a 1 percent or lower chance that no relationship exists between prepositioning and delivery time frames.

^bThe coefficient is statistically significant at the 0.10 level; that is, there is a 10 percent or lower chance that no relationship exists between prepositioning and delivery time frames.

Although both overseas and domestic prepositioning shortened delivery time frames for WFP, the estimated time savings were larger for overseas prepositioning. As table 1 shows, we estimated, using statistical modeling to control for various factors, that prepositioning food in overseas warehouses saved an average of 41 days compared with USAID’s standard shipping process. We found that prepositioning food in domestic warehouses saved fewer days—an estimated average of 16.²⁰

¹⁹Our analysis showed that in fiscal years 2009 through 2012, USAID directed 83 percent of food stored in prepositioned warehouses to WFP.

²⁰ This estimate is statistically significant at the 10 percent level.

For Other Cooperating Sponsors, Prepositioning Food Aid Shortened Average Delivery Time Frame by More than 2 Months

We estimated, using statistical modeling to control for various factors, that prepositioning food aid commodities in overseas and domestic warehouses in fiscal years 2007 through 2012 saved an average of about 67 days for nine of USAID’s cooperating sponsors, compared with USAID’s standard shipping process.²¹ As table 2 shows, during this period, the average delivery time frame for the 141 prepositioned shipments for these cooperating sponsors was about 87 days. In contrast, the average delivery time frame for the 869 standard shipments was 161 days.²²

Table 2: Estimated Days Saved by USAID’s Prepositioning of Emergency Food Aid for Nine Cooperating Sponsors, Compared with Standard Shipping, Fiscal Years 2007-2012

	Number of days saved (regression results)	Margin of error at 95 percent confidence (days)	Average delivery time frame (days)	Number of shipments
Standard shipping	-	-	161	869
All prepositioning	67 ^a	9	87	141
Overseas prepositioning	73 ^a	9	98	52
Domestic prepositioning	62 ^a	13	80	89

Source: GAO analysis of freight forwarder data.

Notes:

For all prepositioning, overseas prepositioning, and domestic prepositioning, we used regression analysis to estimate the number of days saved, controlling for factors such as commodity type and discharge port. As a result, the numbers of days saved do not equal the differences between average delivery time frames. For example, the number of days saved for all prepositioning is 67 days, but the difference between the average delivery time frame for standard shipping and for all prepositioning is 74 days.

The nine cooperating sponsors are CARE, Catholic Relief Services, the government of Pakistan, Norwegian People’s Aid, Relief Society of Tigray, SHARE Guatemala, Save the Children, Save the Children—United Kingdom, and UNICEF. Data for these nine cooperating sponsors are collected and tracked by three freight forwarders.

Delivery time frames begin with the cooperating sponsor’s request for food aid and end with delivery of the requested food at the discharge port for 25 percent of the sponsors and end with delivery of the requested food to the recipient country for 75 percent of the sponsors.

²¹We analyzed data from three freight forwarders for the following nine cooperating sponsors: CARE, Catholic Relief Services, the government of Pakistan, Norwegian People’s Aid, Relief Society of Tigray, SHARE Guatemala, Save the Children, Save the Children—United Kingdom, and UNICEF. We also collected data from three freight forwarders that included eight of cooperating sponsors; however, we did not find these data to be sufficiently reliable for our purposes and did not include them in our analysis. See appendixes I and II for a detailed discussion of our methodology and results.

²²We used regression analysis to estimate the number of days saved, controlling for factors such as commodity type and discharge port. As a result, the numbers of days saved do not equal the difference between the average delivery time frames.

^aThe coefficient is statistically significant at the 0.01 level—that is, there is a 1 percent or lower chance that no relationship exists between prepositioning and delivery time frames.

Both overseas and domestic prepositioning resulted in time savings, with larger savings from overseas prepositioning. As table 2 shows, after controlling for various factors, we estimated that prepositioning food for these cooperative sponsors in overseas warehouses saved an average of 73 days relative to USAID’s standard shipping process. We also estimated that, relative to the standard shipping process, prepositioning food in domestic warehouses saved USAID an average of 62 days.²³

While prepositioning of food aid shortens delivery time frames, it has some disadvantages, according to one cooperating sponsor’s representative whom we interviewed. For example, the representative noted that although overseas prepositioning makes commodities available for immediate collection and thus saves time, handling of prepositioned commodities by multiple parties can lead to losses due to damage during the transit from prepositioning warehouse to discharge port. In addition, prepositioned commodities may be comingled in the warehouse, making it difficult to identify infestation problems in a particular shipment of commodities. The cooperating sponsor’s representative further noted that prepositioned commodities may have to be fumigated several times if they remain in the warehouse for months; if the commodities are overexposed to the fumigation chemicals, they can no longer be used for food aid.²⁴

²³ See appendix II, table 8, for disaggregation of the delivery time frames by delivery endpoint.

²⁴ In reviewing a draft of this report, USAID noted that it had never experienced a situation where a commodity could no longer be used due to overexposure to fumigant.

Diversion of Food Aid Intended for Prepositioning Shortened Delivery Time Frames by About 2 Months

We estimated, using statistical modeling to control for various factors, that diversion of emergency food aid from the prepositioning process shortened the average delivery time frame by about 64 days in fiscal years 2007 through 2012 compared with USAID’s standard shipping process (see table 3). During this period, the average delivery time frame for the 568 diverted shipments was about 76 days.²⁵ In contrast, the average delivery time frame for the 938 standard shipments was 156 days.²⁶

Table 3: Estimated Days Saved by USAID’s Diversion of Prepositioning of Emergency Food Aid Shipments, Compared with Standard Shipping, Fiscal Years 2007–2012

	Number of days saved (regression results)	Margin of error at 95 percent confidence (days)	Average delivery time frame (days)	Number of shipments
Standard shipping	-	-	156	938
Diversion ^a	64^b	22	76 ^c	568

Source: GAO analysis of freight forwarders’ data.

Notes:

We used regression analysis to estimate the number of days saved, controlling for various factors such as commodity type and discharge port. As a result, the number of days saved does not equal the difference between average delivery time frames.

Delivery time frames begin with the cooperating sponsor’s request for food aid and end with delivery of the requested food at the discharge port for some shipments and with delivery of the requested food to the recipient country for other shipments.

^aThe data shown for diversions were provided primarily by one freight forwarder that handles all USAID diversions of emergency food aid. The data include diversions of shipments for WFP and eight other cooperating sponsors.

^bThe coefficient is statistically significant at the 0.01 level—that is, there is a 1 percent or lower chance that no relationship exists between prepositioning and delivery time frames.

^cThis average is calculated in reference to the regression analysis.

²⁵The diversions data that we collected showed that in fiscal years 2007 through 2012, 947 shipments were designated for prepositioning warehouses and 568 (60 percent) of these shipments were diverted. For further details on the differences in our data sources, see appendix II.

²⁶We used regression analysis to estimate the number of days saved, controlling for various factors such as commodity type and discharge port. As a result, the number of days saved does not equal the difference between the average delivery time frames.

2013 Philippines Typhoon

In November 2013, the Typhoon Haiyan affected 16 million people in the Philippines. To help meet immediate needs in the typhoon's aftermath, USAID diverted 5,000 metric tons of rice that it had purchased for its Colombo prepositioning warehouse and provided 1,020 metric tons of rice from the Colombo warehouse. Additionally, USAID airlifted approximately 55 metric tons of emergency food aid commodities from a domestic prepositioning warehouse in Miami, Florida. These commodities—nutrition-dense food bars and other items that did not require cooking—were sufficient to feed 15,000 adults and 20,000 children for 5 days.

According to USAID officials, prepositioning of emergency food aid allows for greater flexibility to divert food assistance when necessary to meet immediate needs. The officials further stated that, because the U.S. government retains ownership of prepositioned food aid, USAID does not have to replace diverted commodities. In contrast, when food aid is shipped under the standard process, non-governmental cooperating sponsors usually take ownership of commodities before they are shipped, and depending on the availability of commodities and resources, USAID may decide to replace diverted shipments.

USAID has diverted commodities before and after they left the U.S. port and at all points in the procurement, transportation, or shipping process.²⁷ Our analysis shows that in fiscal years 2007 through 2012, an average of 80 days elapsed between USAID's ordering commodities for prepositioning and diverting the commodities. The smallest number of days between USAID's ordering and diverting commodities was 6 days, and the largest number of days was 163. Our analysis also shows that larger number of days between USAID's ordering and diverting commodities are associated with shorter delivery time frames.

Prepositioning Emergency Food Aid Involves Additional Costs

USAID pays additional costs for prepositioning of emergency food aid, compared with standard shipping. For both overseas and domestic prepositioning, USAID incurs additional warehouse costs that it does not incur for standard shipments. USAID also incurs additional shipping costs due to a second leg of ocean shipping from overseas prepositioning warehouses to foreign discharge ports. Furthermore, USAID often pays higher weighted annual average prices for domestically prepositioned commodities than it does for standard shipment commodities.²⁸

²⁷ According to USAID, diversions cannot be ordered until an ocean freight carrier has been identified that is willing and able to deliver the diversion to the desired discharge port. Ocean freight contracts may include a window of time when the shipment can be diverted, although the terms vary by contract and carrier. USAID can request diversions after the window has closed, and the carrier may grant the request based on the situation. Some of the larger carriers allow for diversions after the commodity has been loaded on the ocean vessel and the vessel has set sail.

²⁸ We calculated weighted annual average prices by dividing the total commodity cost in a particular year by the total commodity tonnage. The weighted averages take into account the quantity of the purchases, giving more weight to purchases with larger quantities.

USAID Incurs Additional Costs for Prepositioning Warehouses

USAID incurs various additional costs to store prepositioned food in overseas and domestic prepositioning warehouses, depending on the quantity of food stored and the duration of the storage. In contrast, for standard shipments of emergency food aid, USAID transports the food directly from U.S. ports to recipient countries. The cost per day for food storage at USAID's six overseas prepositioning warehouses averaged \$0.25 per ton in fiscal years 2011 and 2012;²⁹ the longer food is stored at the prepositioning warehouses, the higher the storage costs.

In fiscal years 2011 and 2012, USAID expended approximately half of the annual \$10 million authorized by the fiscal year 2008 Farm Bill for overseas warehouse costs.³⁰ Warehouse costs include, in addition to food storage, storage of nonfood items (e.g., bags, pallets, and cartons) and payment of warehouse operators for handling commodities (e.g., unloading trailers and loading bulk commodities). To help ensure that its total costs for overseas prepositioning warehouses do not exceed the ceiling authorized by Congress, USAID sets annual cost targets for each warehouse that total \$8.5 million. In fiscal year 2011, USAID expended approximately \$5.4 million—about 54 percent of its annual ceiling—for food storage and other costs for its overseas prepositioning warehouses. In fiscal year 2012, USAID expended about \$4.6 million—about 46 percent of its annual ceiling. Table 4 shows USAID's annual targets and total expenditures for its overseas prepositioning warehouses in fiscal years 2011 and 2012.

²⁹Storage costs at the six warehouses range from \$0.0 per day at the Las Palmas warehouse to \$0.49 per day at the Lomé warehouse. USAID incurs no daily storage cost for the Las Palmas warehouse, because storage space at the warehouse is donated by the Las Palmas Port Authority and the Spanish government.

³⁰The most recent Farm Bill which became law in February 2014 increased the ceiling to \$15 million. Pub. L. No. 113-79, §3009.

Table 4: Annual Targets and Total Expenditures for USAID Overseas Prepositioning Warehouses, Fiscal Years 2011 and 2012

	Annual target ^a	Fiscal year 2011 expenditures	Fiscal year 2012 expenditures
Colombo	\$1,000,000	\$15,282	\$459,996
Djibouti	2,500,000	2,475,208	1,381,622
Durban	2,000,000	2,783,236 ^b	1,236,265
Las Palmas	1,000,000		184,508
Lomé	1,000,000	105,975	81,272
Mombasa	1,000,000	1,041	1,213,364 ^c
Total	\$8,500,000	\$5,380,743	\$4,557,026

Source: USAID.

^aTo help ensure that its total expenditures for overseas prepositioning warehouses did not exceed the \$10 million authorized by the fiscal year 2008 Farm Bill, USAID sets annual cost ceilings for each warehouse.

^bTotal expenditures for the Durban warehouse exceeded USAID's annual target in fiscal year 2011. According to USAID, it used the Durban warehouse more than expected because of demand for emergency food aid from Zimbabwe and Somalia. However, USAID stayed within the overall annual ceiling of \$10 million for 2011.

^cUSAID's expenditures at the Mombasa warehouse exceeded its annual target in fiscal year 2012. According to USAID, it used the Mombasa warehouse more than expected because of demand for emergency food aid from Somalia. However, USAID's total overseas warehouse expenditures in fiscal year 2012 did not exceed the 2008 Farm Bill's annual ceiling of \$10 million.

In addition, USAID expended \$2.0 million in 2011 and \$3.1 million in fiscal year 2012 for its domestic prepositioning warehouse in Jacinto Port. However, these expenditures did not count against the \$10 million ceiling set by the 2008 Farm Bill.

USAID Incurs Additional Shipping Costs for Overseas Prepositioning

USAID incurs additional shipping costs when overseas prepositioning requires a second leg of ocean shipping, from the overseas prepositioning warehouses to the final discharge ports. Although the first leg of ocean shipping—from a U.S. port to the overseas warehouse—is comparable to ocean transport for standard shipping, the second leg does

not exist in the standard shipping process.³¹ For example, a prepositioned shipment might undergo a first leg of ocean shipping to the Djibouti warehouse and a second leg of ocean shipping from Djibouti to Beira, Mozambique; in contrast, a standard shipment would travel directly from a U.S. port to Beira. As table 5 shows, in fiscal year 2012, 75 percent of shipments from overseas prepositioning warehouses—including 100 percent of shipments from Colombo, Las Palmas, and Lomé—traveled via ocean freight and thus involved costs for the second leg of ocean shipping. In fiscal year 2012, USAID paid a total of \$13 million, averaging \$143 per metric ton, for the second leg of ocean shipping for overseas prepositioned food aid.³²

Table 5: Percentages and Costs of Ocean Shipping of Emergency Food Aid from Overseas Prepositioning Warehouses, Fiscal Year 2012

Warehouse	Total metric tons shipped out	Metric tons shipped by ocean freight	Percentage shipped by ocean freight	Cost of ocean shipping
Colombo	12,710	12,710	100%	\$ 6,456,255
Djibouti	45,795	26,027	57	2,159,507
Durban	39,836	34,616	87	2,876,716
Mombasa	15,850	9,450	60	653,917
Las Palmas	9,300	9,300	100	1,062,216
Lomé	1,673	1,673	100	241,769
Total	125,164	93,776	75%	\$ 13,450,380

Source: GAO analysis of USAID procurement and shipping data.

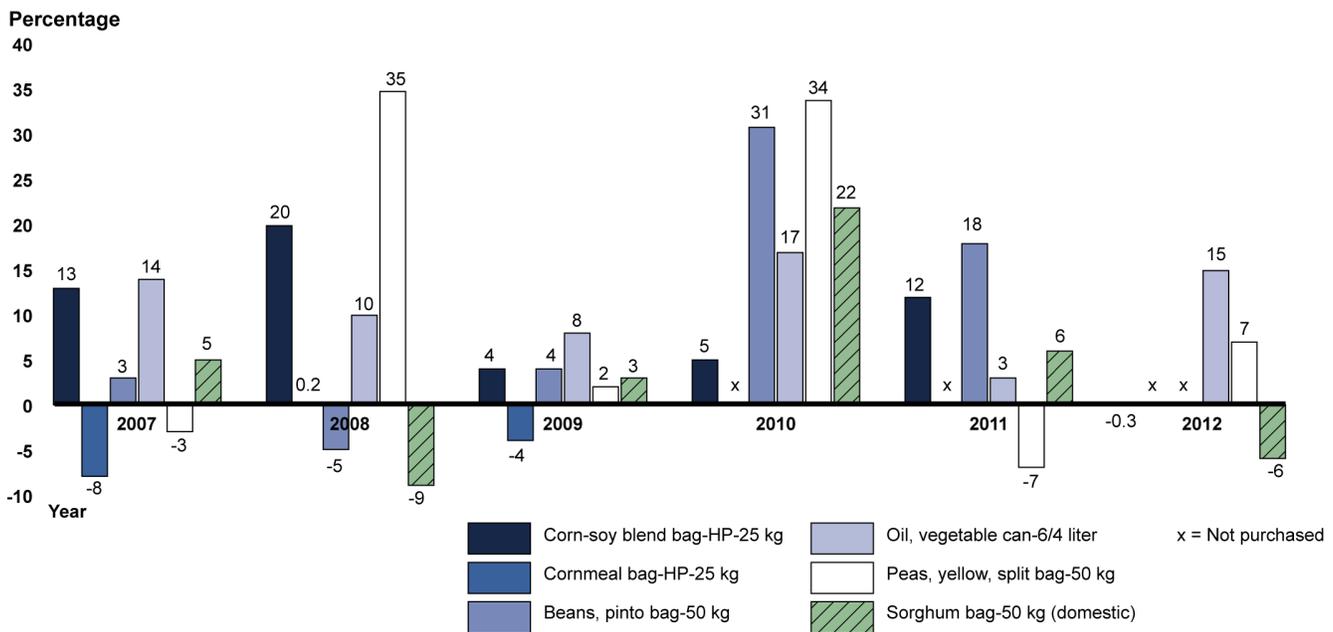
³¹Because the data required to reconstruct the hypothetical cost of direct shipping for every prepositioned shipment were not available to us, we estimated the additional cost due to prepositioning using the actual cost of the second leg of ocean shipping. (See app. III for some examples of how the cost of the second leg of ocean shipping compares with the estimated cost differential between prepositioning and direct shipment). In some cases, costs associated with the second leg of ocean shipping, from a prepositioning warehouse to a discharge port, might differ from the reconstructed cost differential.

³²In addition, prepositioning can increase shipping costs because of cargo preference requirements, which mandate that at least 50 percent of total food aid be shipped on U.S. flag carriers. Because of the lack of U.S. flag carriers from the overseas prepositioning ports, USAID has to increase the share of food aid shipped from U.S. ports on U.S. flag carriers in order to meet the cargo preference requirement. Because U.S. flag carriers, on average, have higher rates than non-U.S. flag carriers, the overall food aid shipping cost may therefore increase as a result of the increased use of prepositioning.

USAID Generally Paid Higher Prices for Domestically Prepositioned Commodities Than for Standard Shipment Commodities

In fiscal years 2007 to 2012, USAID generally paid higher weighted annual average prices for commodities that it purchased for domestic prepositioning than for similar commodities that it purchased for standard shipping. Six commodities—corn-soy blend, cornmeal, pinto beans, vegetable oil, yellow split peas, and sorghum—accounted for 76 percent of USAID’s domestic prepositioning purchases in those years. Figure 2 shows the percentage differences between the weighted annual average prices that USAID paid per ton for domestically prepositioned and standard shipment commodities in fiscal years 2007 through 2012. In figure 2, the bars above the zero line show that USAID paid a higher weighted annual average price for domestically prepositioned commodities in 24 instances, and the bars below the zero line show that USAID paid a lower weighted annual average price in 8 instances. USAID generally did not pay higher weighted annual average prices for overseas prepositioning of these commodities during this period. (See app. IV for more information.)

Figure 2: Percentage Differences between Weighted Annual Average Prices That USAID Paid for Six Domestically Prepositioned Commodities and Standard Shipment Commodities, Fiscal Years 2007-2012



Source: GAO analysis of USAID data.

Note: The graph shows the percentage differences between the weighted annual average price per ton for a given domestically prepositioned commodity and the weighted annual average price per ton for the same commodity procured for standard shipment in the same year. If the percentage difference is greater than 0, the weighted annual average price for the domestically prepositioned commodity was higher than the price for the standard shipment commodity. If the percentage

difference is less than 0, the weighted annual average price for the domestically prepositioned commodity was lower than the price for the standard shipment commodity.

HP = high performance bags.

Many factors may have contributed to the higher weighted annual average prices paid for domestically prepositioned commodities. For example, limited commodity supply and limited numbers of suppliers for domestic prepositioning purchases are two possible factors, according to U.S. officials and commodity vendors whom we interviewed.³³ First, if USAID purchases commodities for domestic prepositioning after commodity vendors have fulfilled their monthly orders for standard shipment and overseas prepositioning, vendors may have a reduced supply of commodities available for domestic prepositioning and may therefore charge higher prices. Second, because domestically prepositioned commodities—unlike standard shipment and overseas prepositioned commodities—are delivered to only two preselected U.S. ports, vendors for some commodities may be unwilling to compete with vendors who are geographically closer to the port and who thus can deliver the commodities to the port more cheaply.

USAID Does Not Systematically Monitor Prepositioning to Maximize Time Savings and Cost Effectiveness

USAID has taken some steps to evaluate timeliness and costs associated with prepositioning. However, the agency does not collect and assess data needed to systematically monitor delivery time frames for prepositioned commodities to maximize time savings. Further, USAID does not systematically monitor the costs of prepositioning to maximize the program's cost-effectiveness. According to USAID guidance, the agency should monitor programs through various activities, including collecting and analyzing data to make necessary program adjustments and to guide higher-level decision making and resource allocation. Additionally, federal internal control standards indicate that monitoring should assess the quality of performance over time and ensure that the findings of these assessments are promptly resolved.³⁴

³³In addition to these two factors, other reasons, such as the frequency of purchases, may account for the differences between the weighted annual average prices for domestically prepositioned commodities and for standard shipment commodities. See appendix IV for the number of annual purchases of domestically prepositioned commodities.

³⁴ See GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

USAID Has Taken Some Steps to Evaluate Prepositioning

USAID has taken some steps to evaluate prepositioning of emergency food aid by examining timeliness and costs. For example, in 2008, USAID commissioned a cost-benefit analysis of prepositioning.³⁵ The analysis found that prepositioning food aid reduced delivery time frames of emergency shipments from an average of 177 days for standard shipments of food aid to an average of 26 days. The analysis also found that the average cost for domestically prepositioned food aid amounted to an additional \$23 per metric ton, and the average cost for overseas prepositioned food aid amounted to an additional \$164 per metric ton. However, the methodology for the 2008 analysis had several limitations. First, the analysis did not include data on delivery time frames for WFP, USAID's largest cooperating sponsor for emergency food aid. Second, the analysis included data on delivery time frames up to the date when the shipments were discharged at the foreign ports but did not include any data up to the date when the shipments arrived in the recipient countries. Third, the evaluation did not compare shipments of prepositioned food with standard shipments that had similar characteristics, such as the recipient country. Because differences in such characteristics can contribute to differences in delivery time frames, the evaluation may not have accurately isolated the effects of prepositioning.

In 2009, USAID also developed a framework for prepositioning that outlines the purpose of the program. However, the framework is not up-to-date and does not guide current prepositioning practices, according to USAID officials. Additionally, the framework does not outline guidelines for evaluations on timeliness or costs.

In 2013, USAID's Inspector General found that the agency had not determined whether the benefits of overseas prepositioning in the Horn of Africa outweighed the costs and whether overseas prepositioning saved time compared with domestic prepositioning. The report recommended, among other things, that USAID conduct another independent evaluation of the cost and timeliness of prepositioning.³⁶ In November 2013, USAID released a solicitation for a third-party vendor to conduct an independent

³⁵Janet R. van der Vaart, *P.L. 480 Title II Pre-positioning Cost/Benefit Analysis* (2008).

³⁶U.S. Agency for International Development, Office of Inspector General, *Audit of USAID's Internal Controls Over Prepositioned Food Assistance for the Horn of Africa*, Audit Report No. 4-962-13-004-P (Jan. 7, 2013).

evaluation of prepositioning; the contract was awarded in January 2014. According to USAID, the evaluation will be finalized in March 2014 and will include an analysis of the cost, benefits, and effectiveness of prepositioning.³⁷

USAID Does Not Collect and Assess Data Needed to Systematically Monitor Delivery Time Frames for Prepositioned Commodities

Although USAID's goal for prepositioning is to improve the timeliness of emergency food aid, USAID does not collect or assess data needed to systematically monitor delivery time frames for prepositioned emergency food aid shipments. According to guidance in USAID's Automated Directives System, the agency should monitor programs through various activities, including collecting and analyzing data to make necessary program adjustments and to guide higher-level decision making.³⁸ Moreover, USAID's evaluation policy states that programs can best manage for results by collecting and analyzing information to track progress toward planned results and by ensuring that implementing partners collect relevant monitoring data. The policy also states that monitoring can reveal whether desired results are occurring and whether implementation is on track.³⁹

USAID officials told us that the agency would be able to calculate delivery time frames of prepositioned food only if its cooperating sponsors provided data on all emergency food aid shipments. According to the officials, these sponsors are responsible for tracking food shipments once the shipments leave U.S. loading ports. However, according to USAID, the terms of its agreements with its cooperating sponsors do not require these sponsors to collect or provide comprehensive data to USAID. As a result, USAID lacks the ability to determine whether prepositioning is achieving its primary goal of shortening response times or to identify possible time savings relative to standard emergency food aid shipments.

In addition, some emergency food aid data that are currently available from WFP and USAID's other cooperating sponsors have limitations that

³⁷The contract specifies that a draft of the evaluation will be available 60 days from the start of the contract.

³⁸U.S. Agency for International Development, *Automated Directives System (ADS) Chapter 203: Assessing and Learning* (Washington D.C.: Feb. 10, 2012).

³⁹U.S. Agency for International Development, *USAID Evaluation Policy* (Washington D.C.: January 2011).

constrain their usefulness for monitoring delivery time frames. We collected data on emergency food aid shipments, including prepositioned shipments, from 19 cooperating sponsors; however, because of the following limitations, we did not include some of these data in our analysis of delivery time frames.

- **Limitations in WFP data.** We did not use data provided by WFP for our analysis of diversion's effect on delivery time frames, because WFP's data on emergency food aid shipments do not distinguish diversions from other standard or prepositioned shipments. WFP also was unable to provide data for years before 2009 because of changes in its data management systems. As a result, we used data provided by a freight forwarder for our analysis of WFP diversions.
- **Limitations in some data from several other cooperating sponsors.** Some data from five cooperating sponsors that received emergency food aid in fiscal years 2007 through 2012 do not distinguish emergency food aid shipments from other types of food aid shipments. In addition, some data for these five cooperating sponsors and three others were incomplete, missing some shipments and providing only partial information for others. As a result, we were unable to use some of the data from these eight sponsors.

USAID Does Not Systematically Monitor the Total Cost of Prepositioning to Maximize Cost Effectiveness

Although USAID collects data on the cost of its international food aid programs, it does not use these data to systematically monitor the total cost of prepositioning in order to maximize the program's cost effectiveness. According to USAID's Automated Directives System, the agency should collect and analyze data to make necessary program adjustments and to guide higher-level decision making and resource allocation.⁴⁰ Further, federal internal controls indicate that monitoring should assess the quality of performance over time and ensure that the findings of these assessments are promptly resolved. USAID collects data on the total costs of its overseas prepositioning warehouses to ensure that the costs do not exceed the limit established by Congress.⁴¹ However, USAID does not analyze this information to determine whether the locations of these warehouses are cost effective. Further, the agency

⁴⁰U.S. Agency for International Development, *Automated Directives System (ADS)*, Chapter 203.

⁴¹See 7 U.S.C. § 1736a(c)(4)(A).

does not systematically or routinely monitor and analyze prepositioning commodity and shipping costs to determine the cost-effectiveness of prepositioning.⁴²

USAID collects data on prepositioning commodity and shipping costs, according to agency officials. However, USAID does not store these data in a single system or spreadsheet, where they would be easily accessible for monitoring purposes. Instead, according to USAID, various offices collect these data and store them in a number of different systems or spreadsheets.⁴³ In addition, agency officials told us that because prepositioning is not a separate program but is part of USAID's emergency food aid program, the agency does not monitor prepositioning costs separately. These officials also stated that the agency does not monitor prepositioning's total costs, because the primary goal of prepositioning is rapid response rather than financial savings.

As a result of the lack of monitoring of prepositioning costs, USAID does not conduct analyses that could help it manage its resources and improve the program's cost-effectiveness. For example, the agency does not know the causes of the commodity price differences that we identified and therefore is limited in its ability to ensure that the procurement of prepositioned commodities is conducted in a cost-effective manner.

Conclusions

The emergency food aid that USAID provides helps to save lives in countries where ongoing or unanticipated crises have severely disrupted food supplies. Our analysis of prepositioning showed that this approach can have a significant effect on the United States' and its cooperating sponsors' ability to deliver food quickly in response to humanitarian emergencies. However, without reliable data on the delivery time frames of prepositioned shipments, USAID lacks management tools that could help it assess and improve prepositioning's effect on emergency response times. Such data could also help USAID assess the tradeoffs between prepositioning's timeliness and its additional warehouse, shipping, and commodity costs. Furthermore, although cost savings are

⁴²According to USAID, an upcoming independent evaluation on prepositioning will analyze the cost effectiveness of prepositioning.

⁴³According to USAID, all contracts related to the costs of the prepositioning program are reviewed and evaluated by USAID contracting officials.

not USAID's primary goal for the prepositioning program, without systematic monitoring of the total cost of prepositioning the agency has limited ability to maximize the resources available for addressing emergency food crises.

Recommendations for Executive Action

To strengthen USAID's ability to help ensure that its food aid prepositioning program meets the goal of reducing delivery time frames in a cost-effective manner, we recommend that the USAID Administrator take the following three steps to systematically

1. collect, and ensure the reliability and validity of, data on delivery time frames for all emergency food aid shipments, including prepositioned food aid shipments;
2. monitor and assess data on delivery time frames for prepositioned food aid shipments; and
3. monitor and assess costs associated with commodity procurement, shipping, and storage for prepositioned food aid shipments.

Agency Comments

We provided a draft of this report for comment to USAID.

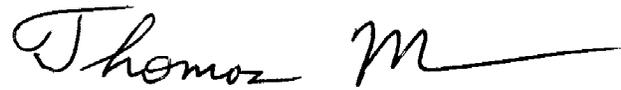
USAID provided written comments on a draft to this report, which we reprinted in appendix VI. In its comments, USAID concurred with our recommendations. In addition, USAID stated that it is working to identify actions needed to ensure the collection of reliable data on delivery time frames for all emergency food aid. USAID also stated that it is revising its prepositioning program strategy to provide a framework for monitoring and assessing data on the timeliness and cost effectiveness of the prepositioning program.

In addition to providing copies of this report to your offices, we will send copies to interested congressional committees. We will make copies available to others on request. In addition, the report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff have any questions regarding this report, please contact me at (202) 512-9601 or MelitoT@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on

the last page of this report. GAO staff who made key contributions to this report are listed in appendix VI.

Sincerely yours,

A handwritten signature in black ink that reads "Thomas M" followed by a long horizontal flourish.

Thomas Melito
Director, International Affairs and Trade

Appendix I: Objectives, Scope, and Methodology

We examined (1) the effects of USAID's prepositioning on delivery time frames for emergency food aid shipments, (2) the effects of prepositioning on the costs of emergency food aid, and (3) the extent to which the agency monitors prepositioning to manage program resources effectively.

To examine the effects of prepositioning on delivery time frames, we collected shipment-level data from the World Food Program (WFP) and six freight forwarders for 19 other cooperating sponsors.¹ We assessed the reliability of these data by asking WFP and the six freight forwarders how the data were collected, what quality checks were performed, and what other internal controls were in place. We determined that the data were sufficiently reliable for tracking the delivery time frames of emergency food aid for WFP and three of the freight forwarders that manage the food aid supply chain for nine cooperating sponsors. For the remaining three freight forwarders, the data were not sufficiently reliable for tracking delivery time frames because of a number of limitations, including incomplete or missing data and, in one freight forwarder's data, a lack of distinction between emergency and nonemergency shipments.

The data that we included in our analysis of the effects of prepositioning on delivery time frames include the date when the cooperating sponsor requested the food (or the closest approximation)² and the date when the

¹Cooperating sponsors are organizations that have received USAID grants for delivery of emergency food aid to recipient countries. Freight forwarders are contractors that manage USAID's and other cooperating sponsors' food aid supply chain. WFP, which is also a cooperating sponsor, maintains its own shipment data and was able to provide this information.

²Data provided by WFP and the three freight forwarders approximate the dates when the cooperating sponsors requested the food from USAID. Data provided from one of the three freight forwarders included the date when USAID approved the request, up to a few weeks afterward. This should not affect our estimates of days saved. According to USAID, the number of days between the request for food and USAID's approval date is similar for prepositioned and standard shipments. WFP's data provide the date when WFP and USAID signed a grant agreement, which could be 5 days or less before the date when WFP requested the food. However, both USAID and WFP officials noted that whether a shipment was sourced from a prepositioning warehouse or the standard shipping process did not affect the number of days between the request for food date and USAID's grant agreement date. Therefore, in comparisons of prepositioned and standard shipments, the days between the request for food and USAID's grant agreement should not affect our estimates of days saved by prepositioning.

food arrived at the discharge port or in the recipient country.³ In addition, the data indicate whether the shipment was from prepositioning. The data also include other shipment characteristics—for example, the loading port, the discharge port, and the commodity shipped—and indicate whether the shipment was an emergency or nonemergency shipment and whether it was bulk or packaged.

We separately discuss our analysis of data provided by WFP and the other cooperating sponsors' three freight forwarders because WFP's and these freight forwarders' data differ in the time periods covered and their treatment of food aid diversions.

- **Time periods covered.** Data provided by WFP cover shipments in fiscal years 2009 through 2012, while data provided by the three freight forwarders cover shipments in fiscal years 2007 through 2012.
- **Treatment of food aid diversions.** Data provided by WFP do not distinguish shipments that USAID diverted from the prepositioning process from shipments that it prepositioned, while data provided by the freight forwarders do identify diversions. Despite this difference, our analysis suggests that using WFP's data to estimate the number of days saved from prepositioning would not have affected our estimates significantly.

To analyze delivery time frames, we calculated the number of days between a cooperating sponsor's request for the commodities and the commodities' arrival at the discharge port or in the recipient country. To compare delivery time frames for overseas and domestic prepositioning with those for standard shipping for WFP and for other cooperating sponsors, we estimated ordinary least squares regression models to

³Data provided by WFP include only the date of the shipment's arrival at the discharge port. Data provided by the freight forwarders include the date of arrival at the discharge port for some shipments and the date of arrival in the recipient country for others (even if the discharge port was outside the recipient country). While the average delivery time frames differ for shipments with the date of arrival in the recipient country compared with shipments with the date of arrival at the discharge port, we did not find evidence that combining these shipments would affect our estimates of number of days saved from prepositioning; inland transport from the discharge port to the recipient country is similar for prepositioned and standard shipments. See table 8 in appendix II for average delivery time frames for shipments with the date of arrival at the discharge port and in the recipient country.

control for characteristics of prepositioning and standard shipments that would allow us to isolate the effect of prepositioning.⁴

To examine the effects of USAID's diversions of emergency food aid shipments on delivery time frames, we used data primarily from the freight forwarder responsible for tracking all diverted shipments for World Food Program (WFP) and for eight other cooperating sponsors.⁵ This freight forwarder's data include all diverted food aid shipments from fiscal years 2007 through 2012. For the comparison group of standard shipments, we used data from this freight forwarder in addition to data from two other freight forwarders. We determined that these data were sufficiently reliable for tracking delivery time frames. Like the data that we included in our analysis for prepositioning, the diversions data are at the shipment level and include the date when WFP and other cooperating sponsors requested the food (or the closest approximation)⁶ and the date when the food arrived at the discharge port or in the recipient country. In addition, the data indicate whether the shipment was diverted. The data also include other shipment characteristics—for example, the loading port, the discharge port, and the commodity shipped—and indicate whether the shipment was bulk or packaged and was an emergency or nonemergency shipment. GAO analysts collected the dates USAID authorized food aid diversions by reviewing one freight forwarder's shipment documents.⁷

⁴See appendix II for further details and results of the regression models.

⁵While almost all diversion data analyzed were provided by one freight forwarder responsible for tracking all diverted shipments, data for 39 diverted shipments were analyzed using data from two other freight forwarders because their information better approximated the date the cooperating sponsors requested food. Cooperating sponsors included in the diversion data are ACDI/VOCA, Adventist Development and Relief Agency, CARE, Counterpart International, Catholic Relief Services, Food for the Hungry, Save the Children—U.S., and World Vision.

⁶For diversions, when the date of the cooperating sponsor's request for the food was unavailable, we used as an approximation the date when USAID authorized the diversion. According to USAID, USAID generally authorizes diversions a few days after the cooperating sponsor requests the food.

⁷ While we may have introduced measurement error to the regression model with our data collection, measurement error should not affect our estimate of the number of days saved from diversions compared with standard shipments.

To analyze additional costs associated with prepositioning, we looked at three types of cost that are unique to prepositioned food: costs for prepositioning warehouses, costs for ocean shipping from overseas prepositioning warehouses to discharge ports, and costs for procurement for prepositioning commodities.

- **Warehouse costs.** To analyze prepositioning warehouse costs, we obtained warehouse contracts from USAID. Each contract identifies the annual expenditure target that USAID had established for the warehouse as well as the daily storage charge per metric ton and outlines other charges related to handling the commodities.
- **Ocean shipping costs.** We estimated the additional cost due to prepositioning using the actual cost of the second leg of ocean shipping, because the data required to re-construct the hypothetical cost of direct shipping for every prepositioned shipment were not available to us. Although the first leg of ocean shipping—from a U.S. port to the overseas warehouse—is comparable to ocean transport for standard shipping, the second leg does not exist in the standard shipping process.⁸ We obtained data from USAID that track the mode of transportation of shipments from each of the overseas warehouses, the metric tonnage, and the freight cost. (See app. III for examples of the additional ocean transportation costs.)
- **Commodity procurement costs.** To analyze prepositioning commodity procurement costs, we focused on six commodities that accounted for 76 percent of total prepositioning purchases. We compared the weighted annual average prices of commodities purchased for domestic prepositioning, overseas prepositioning, and standard shipping. To understand the possible reasons for the observed differences in prices for prepositioned commodities, we interviewed U.S. Department of Agriculture (USDA) officials as well as commodity vendors. (See app. IV for the results of the price comparison.)

To examine the extent to which USAID monitors prepositioning to maximize time savings and cost effectiveness, we reviewed USAID

⁸In some cases, costs associated with the second leg of ocean shipping, from a prepositioning warehouse to a discharge port, might not be the same as the reconstructed cost differential.

documentation related to prior, current, and future efforts to monitor its prepositioning program, specifically efforts to monitor the delivery time frames and program costs. We also interviewed USAID officials in Washington, D.C., to discuss the extent to which the agency has taken steps to monitor the program. We also interviewed WFP, one other cooperating sponsor, and freight forwarders in Washington, D.C. We reviewed evaluations and reports on USAID's prepositioning, such as a 2008 evaluation of the program and a 2013 USAID Inspector General report on prepositioning.⁹ Using USAID criteria, we evaluated USAID's efforts to monitor its prepositioning program.¹⁰ We also analyzed and assessed the reliability of data on emergency food aid shipments that we collected from cooperating sponsors' freight forwarders to determine whether these data could be used to monitor delivery time frames of prepositioned food. We found that the data provided by three freight forwarders were not sufficiently reliable for tracking delivery time frames for emergency food aid shipments owing to a number of limitations, including incomplete or missing data and, in one freight forwarder's data, lack of distinction between emergency and nonemergency shipments. We also reviewed relevant legislation to determine where there are any statutory requirements to monitor or evaluate USAID's prepositioning program.

We conducted this performance audit from July 2013 to March 2014 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

⁹Janet R. van der Vaart, *P.L. 480 Title II Pre-positioning Cost/Benefit Analysis* (2008); and U.S. Agency for International Development, Office of Inspector General, *Audit of USAID's Internal Controls Over Prepositioned Food Assistance for the Horn of Africa, Audit Report No. 4-962-13-004-P* (Jan. 7, 2013).

¹⁰U.S. Agency for International Development, *Automated Directives System (ADS) Chapter 203: Assessing and Learning* (Washington D.C.: Feb.10, 2012); *USAID Evaluation Policy* (Washington D.C.: January 2011).

Appendix II: Delivery Time Frames Regression Analysis

A variety of factors besides prepositioning and food aid diversions may affect delivery time frames, therefore we developed a statistical model—a linear regression model—to control for factors that are likely to be associated with delivery time frames, helping to isolate the effect of prepositioning and food aid diversions.

Data Sources

We collected shipment data from the WFP and six freight forwarders.¹ The data indicate whether the shipment was from prepositioning or was standard and include the date (or the closest approximation) when the cooperating sponsor requested the food,² the date of the food's arrival at the discharge port or in the recipient country, and other shipment characteristics such as the commodity shipped. We assessed the reliability of these data by asking WFP and the six freight forwarders how the data were collected, what quality checks were performed, and whether other internal controls were in place. We determined that the data from WFP and three of the freight forwarders³—74 percent of the data we collected—were sufficiently reliable for tracking delivery time frames and comparing standard, prepositioning, and diverted shipments. Table 6 shows the numbers of prepositioned, standard, and diverted shipments represented in the data that we deemed sufficiently reliable for our analysis.

¹In fiscal years 2007 through 2012, seven freight forwarders managed USAID's and its cooperating sponsors' supply chain. We collected data from six of these contractors; we did not collect data from WFP's freight forwarder, instead collecting data directly from WFP. We did not include in our analysis data from three of the other six freight forwarders, because we found that data were incomplete or missing in these three contractors' data and we could not distinguish emergency from nonemergency shipments in one of these contractors' data.

²See appendix I for a discussion of dates included in WFP and the freight forwarders' data.

³These three freight forwarders manage the Title II emergency food aid supply chain for nine of USAID's cooperating sponsors.

Appendix II: Delivery Time Frames Regression Analysis

Table 6: Numbers of Emergency Food Aid Shipments Represented in Data Included in GAO Analysis

Data source	Number of shipments	Percentage of total	Prepositioning shipments	Standard shipments
Included in GAO analysis				
WFP	2,137	42	472	1,665
Three freight forwarders ^a	1,010	20	141	869
Diverted shipments ^b	568	11		
WFP shipments ^c	70	1		
Subtotal	3,785	74	613	2,603
Not included in GAO analysis	1,357	26		
Total shipments represented	5,142			

Source: GAO analysis of WFP's and freight forwarders' data.

Notes:

^aThe three forwarders manage the Title II emergency food aid supply chain for nine of USAID's cooperating sponsors.

^bWFP's data do not identify diversions from other types of shipments.

^cOne freight forwarder included data on 69 standard shipments and 1 domestically prepositioned shipment for WFP.

We excluded shipments from our analysis that were outside our scope,⁴ were duplicated in two freight forwarders' data, or did not have a discernible delivery time frame. In addition, we found data from the remaining three freight forwarders to be insufficiently reliable for tracking delivery time frames of emergency food aid owing to a number of limitations, including incomplete or missing data and, in one freight forwarder's data, a lack of distinction between emergency and nonemergency shipments. Table 7 shows the number of shipments that we excluded from our analysis and the reasons for their exclusion.

⁴These shipments include shipments ordered in fiscal year 2013 and shipments ordered by USAID for the prepositioning warehouses. Shipments ordered for the prepositioning warehouses do not fulfill a cooperating sponsor's request; instead, their contents are stored in prepositioning warehouses and are later used to fulfill cooperating sponsors' requests.

Table 7: Numbers of Emergency Food Aid Shipments Represented in Data Excluded from GAO Analysis and the Reasons for Exclusion

Reason for exclusion	Number of shipments
Outside our scope ^a	572
Duplicate shipments ^b	29
Shipment with indiscernible delivery time frame	1
Not sufficiently reliable	755
Total	1,357

Source: GAO analysis of WFP's and freight forwarders' data.

^aThese shipments include shipments ordered in fiscal year 2013 and shipments ordered by USAID for the prepositioning warehouses. Shipments ordered for the prepositioning warehouses do not fulfill a cooperating sponsor's request, but instead comprise the food stored in prepositioning warehouses that are later used to fulfill cooperating sponsors' requests.

^bThese shipments were included in two freight forwarders' data, but are more accurately captured in one set of data. We then exclude the duplicate shipments in the other set of data.

We separately analyzed data provided by WFP and the three freight forwarders that we included in our analysis, because the two groups of data differ in the time periods covered and their treatment of food aid diversions. WFP's data cover shipments in fiscal years 2009 through 2012, while the three freight forwarders' data cover shipments in fiscal years 2007 through 2012. In addition, WFP's data do not distinguish between diversions of food aid and other shipments, preventing our estimation of the number of days saved from diversions of food aid using WFP's data.

We also separately analyzed the effect of food aid diversions on delivery time frames. All food aid diversions, including diversions to WFP's programs, are managed by one freight forwarder.⁵ For a comparison group, we used standard shipments included in the three freight forwarders' data.⁶ We did not include WFP's data in the comparison group because of the differences between WFP's and the three freight forwarders' data. GAO analysts collected the dates USAID authorized

⁵ Almost all of the diversion data that we analyzed were provided by one freight forwarder responsible for tracking all diverted shipments. However, for 39 diverted shipments, we analyzed data provided by two other freight forwarders, because these data better approximated the date when the cooperating sponsors requested food.

⁶One freight forwarder's data include 69 standard shipments and 1 shipment from domestic prepositioning that were destined for WFP's programs, which we also included in the comparison group.

food aid diversions by reviewing one freight forwarder's shipment documents.⁷

Limitations

Because of differences between the data sources, we used slightly different start and end dates to estimate delivery time frames. In addition, our results from the linear regression model do not cover 2007 and 2008 for WFP's shipments or other freight forwarders' shipments not included in our analysis.

- **Start dates.** Although we defined delivery time frame as the number of days between a cooperating sponsor's request for food and arrival at a discharge port or recipient country, the start dates we collected were the best available approximations of the date of request and differed slightly in data provided by WFP and the freight forwarders. However, USAID and WFP officials stated that the number of days between the start dates and WFP's food request dates does not differ for prepositioning and standard shipments. USAID and freight forwarder officials also stated that the number of days between the freight forwarder start dates and the dates they request the food does not differ for prepositioning and standard shipments. For comparisons of prepositioning and standard shipments, the difference between the start dates we collected and the request dates should not affect our results. However, these differences may affect the average delivery time frames we calculated, which should be considered as context for our regression analysis rather than exact estimates. For diversions, we also used the best available approximations of the date of request—usually the date when USAID authorized the diversion. According to USAID officials, the authorization date is generally a few days after the request date. Therefore, for comparisons of diversions and standard shipments, our estimates should be accurate to within a few days.
- **End dates.** Data provided by WFP include only the date of the food's arrival at the discharge port. Data provided by the freight forwarders include, for some freight forwarders, only the date of the food's arrival at the discharge port for some shipments and, for other freight

⁷ While our data collection may have introduced measurement error to the regression model, measurement error should not affect our estimate of the number of days saved by diversions compared with standard shipments.

forwarders, only the date of the food's arrival in the recipient country when inland transportation is required. Although this affects the average delivery time frames we calculated, it should be considered as context for our regression analysis rather than exact estimates. Moreover, we found that combining these shipments did not affect our regression estimates of number of days saved from prepositioning; inland transport from the discharge port to the recipient country is similar for prepositioned and standard shipments. In addition, we controlled for the port of arrival (either a discharge port or in the recipient country) in our analysis. See table 8 for average delivery time frames for shipments with dates of arrival at the discharge port and in the recipient country.

- **Treatment of diversions.** Data provided by WFP do not distinguish diversions from standard or prepositioning shipments. However, we estimate that this limitation may affect our estimates of number of days saved by prepositioning by only a few days.⁸
- **Nongeneralizable results.** Our estimates are not generalizable beyond the time periods covered by the data (fiscal years 2009 through 2012 for data provided by WFP and fiscal years 2007 through 2012 for the data provided by the freight forwarders) or beyond WFP and the three freight forwarders' data that we included in our analysis.

Average Delivery Time Frames

Table 8 shows the average delivery time frames for two groups of emergency food aid shipments. The first group comprises shipments shown in WFP's data, with delivery time frame defined as the number of days between the date when WFP and USAID signed a grant agreement and the date when the shipment arrived at the discharge port. The second group comprises shipments shown in the freight forwarders' data, with the delivery time frame defined as the number of days between the date when the cooperating sponsor requested the food and the date when the shipment arrived at the discharge port or recipient country.

⁸To estimate the effect of this limitation on our results for WFP, we estimated the amount of commodities diverted to WFP programs using data from the freight forwarder that tracks all diversions. We made the conservative assumption that all of these diversions are standard shipments in WFP's data. Using the estimated number of days saved by diversions, based on the freight forwarders' data, we were then able to estimate the bias introduced by this limitation.

Table 8: Average Delivery Time Frames (in Days) for Emergency Food Aid Shipments

	Standard shipments	All prepositioning shipments	Overseas prepositioning shipments	Domestic prepositioning shipments
WFP (fiscal years 2009-2012)^a				
Average delivery time frame	135	102	92	114
Number of shipments	1,665	472	262	210
Three freight forwarders (fiscal years 2007-2012)				
Data with date of arrival in the recipient country (includes land transport)				
Average delivery time frame	170	110	103	120
Number of shipments	681	79	47	32
Data with date of arrival at the discharge port (does not include land transport)				
Average delivery time frame	129	58	54	58
Number of shipments	188	62	5	57

Source: GAO analysis of WFP's and three freight forwarders' data.

Note: The three forwarders manage the Title II emergency food aid supply chain for nine of USAID's cooperating sponsors.

^aData provided by WFP do not identify diversions from other types of shipments.

Prepositioning

To isolate the effect of prepositioning on delivery time frames for emergency food aid, we estimated ordinary least squares regression models that control for characteristics of prepositioned and standard shipments for WFP and for the nine other cooperating sponsors represented in the three freight forwarders' data. Tables 9 and 10, respectively, show the results of our regression analysis of the data collected from WFP and the three freight forwarders, demonstrating the average number of days saved by prepositioning relative to standard shipping delivery time frames. Specifically, we estimated $Y_i = \alpha + \beta Prepo_i + \delta X_i + \epsilon_i$ for the second column in each table, where Y_i is the delivery time frame of shipment i , $Prepo_i$ is a dummy for whether shipment i is from prepositioning, and X_i are the control variables listed in column 1. We estimated $Y_i = \alpha + \beta_1 DomesticPrepo_i + \beta_2 OverseasPrepo_i + \delta X_i + \epsilon_i$ for the third column, where Y_i is the delivery time frame of shipment i , $DomesticPrepo_i$ is a dummy for when shipment i is from domestic prepositioning, $OverseasPrepo_i$ is a dummy for when shipment i is from overseas prepositioning, and X_i are the control variables listed in

column 1.⁹ We clustered the standard errors by the discharge port or recipient country. For WFP, we included the discharge port, the year of the commodity request, the month of the commodity request, and the commodity type as control variables. For the nine cooperating sponsors, we included the freight forwarder, the cooperating sponsor, the discharge port or recipient countries, the year of the commodity request, the month of the commodity request, and the commodity type as control variables. These variables are known to USAID when cooperating sponsors submit requests for commodities.¹⁰ Controlling for these variables allowed us to compare shipments that fulfilled requests with similar characteristics. We did not control for the shipment’s tonnage, the port of loading, and other variables that USAID determines when it decides whether to fulfill a sponsor’s request with commodities sourced from the standard shipping process or from prepositioned warehouses.¹¹

Table 9: Estimated Days Saved by USAID’s Prepositioning Emergency Food Aid for the World Food Program, Relative to Standard Shipping, Fiscal Years 2009- 2012

	Prepositioning regression	Domestic and overseas prepositioning regression
Coefficients and standard errors for prepositioning		
Prepositioning (domestic or overseas)	-27.504***	
Standard error	<7.419>	
Domestic prepositioning		-15.652***
Standard error		<8.497>
Overseas prepositioning		-40.692***
Standard error		<8.258>
Sample size	2137	2137

⁹These regression results are robust to removing outliers and influential shipments. Removing the slowest and fastest shipments and influential shipments yields similar regression results. In addition, estimating a propensity score matching model yields similar results.

¹⁰Cooperating sponsors’ requests also include the tonnage requested. However, USAID decides how much tonnage to include in each shipment when it decides whether to source the shipment from the standard shipping process or prepositioned warehouses. USAID may source part of the request from prepositioned warehouses and the rest from the standard shipping process.

¹¹We estimated models controlling for the shipment’s tonnage and the flag of the ocean vessel which yielded similar regression results.

Appendix II: Delivery Time Frames Regression Analysis

	Prepositioning regression	Domestic and overseas prepositioning regression
Adjusted R squared	0.36	0.37
Coefficients of other control variables		
Discharge ports		
Jomi, Tajikistan	Dropped	Dropped
Abidjan, Cote d'Ivoire	6.635**	-0.685
Adale, Somalia	80.198***	90.836***
Aden, Yemen	-8.507	-8.015
Alexandria, Egypt	-68.645***	-68.837***
Ashdod, Israel	5.573	5.923
Bangkok, Thailand	-23.516***	-23.700***
Barranquilla, Columbia	3.177	3.252
Beira, Somalia	22.448***	22.335***
Benghazi, Libya	-46.713***	-45.725***
Berbera, Somalia	-15.124**	-5.162
Bosasso, Somalia	52.818***	64.966***
Calcutta, India	13.542*	14.604*
Cap-Haitien, Haiti	-18.186**	-20.480**
Chittagong, Bangladesh	2.585	5.188
Colombo, Sri Lanka	-1.512	0.127
Cotonou, Benin	-11.132**	-13.402**
Dakar, Senegal	-30.519***	-31.210***
Dar Es Salaam, Tanzania	10.183**	9.598*
Djibouti, Djibouti	-7.882	-8.732
Douala, Cameroon	5.39	3.714
Durban, South Africa	7.453	4.476
Fort Dauphin, Madagascar	9.796	16.189*
General Santos City, Philippines	49.923***	50.207***
Gonaives, Haiti	-1.479	0.499
Guayaquil, Ecuador	-20.077**	-19.961**
Hodeiyah, Yemen	19.804***	18.562***
Jacmel, Haiti	-53.479***	-51.501***
Karachi, Pakistan	-4.945	-3.551
Laem Chabang, Thailand	-37.967***	-40.693***
Lome, Togo	-22.372***	-24.901***
Manila, Philippines	5.152	7.905
Matadi, Democratic Republic of Congo	15.063**	14.688*

Appendix II: Delivery Time Frames Regression Analysis

	Prepositioning regression	Domestic and overseas prepositioning regression
Misurata, Libya	-12.642	-10.867
Mogadishu, Somalia	98.367***	110.285***
Mombasa, Kenya	14.631***	14.954***
Monrovia, Liberia	-31.973***	-38.442***
Nouakchott, Mauritania	-32.020***	-30.749***
Oran, Algeria	17.651***	15.388***
Polloc, Philippines	36.141***	39.586***
Port-Au-Prince, Haiti	-26.111***	-34.224***
Port Sudan, Sudan	16.398***	18.560***
Port Qasim, Pakistan	-22.322***	-21.066***
Santo Tomas, Guatemala	-30.379**	-31.267***
Tema, Ghana	-49.695***	-43.731***
Toliara, Madagascar	17.957***	23.456***
Trincomalee, Sri Lanka	-23.951***	-22.696***
Year of order		
Ordered 2008	56.024***	52.333***
Ordered 2009	21.312***	17.922**
Ordered 2010	10.169**	7.774
Ordered 2011	11.609***	9.876***
Ordered 2012	Dropped	Dropped
Month of order		
Ordered January	Dropped	Dropped
Ordered February	7.361	8.926
Ordered March	25.336***	26.426***
Ordered April	20.218***	20.951***
Ordered May	11.224*	13.165**
Ordered June	4.923	5.932
Ordered July	18.563**	20.328***
Ordered August	7.747	9.484
Ordered September	-6.654	-8.178
Ordered October	12.974***	14.667***
Ordered November	13.676	14.626
Ordered December	17.383	18.921
Commodity		
Beans	Dropped	Dropped
Bulgur	17.683*	21.491**

Appendix II: Delivery Time Frames Regression Analysis

	Prepositioning regression	Domestic and overseas prepositioning regression
Corn soya blend	-10.246	-5.679
Lentils	-16.341	-16.984
Maize	15.303**	15.467**
Peas	-5.21	-4.053
Rice	3.044	3.976
Sorghum	-32.612***	-31.433***
Vegetable oil	-19.131***	-16.100***
Wheat	-16.190*	-15.305*
Wheat flour	24.436***	25.118***
Wheat soya blend	31.108***	29.090***
Bulk/packaged commodity	4.114	5.982

Source: GAO analysis of WFP data.

Notes:

Data provided by WFP do not distinguish diversions from other types of shipments.

In each category of control variables, one variable is dropped from the regression to serve as the comparison group for the other dummy variables in that category.

* = significant at the 10 percent significance level.

** = significant at the 5 percent significance level.

*** = significant at the 1 percent significance level.

Table 10: Estimated Days Saved by USAID’s Prepositioning Emergency Food Aid for Nine Cooperating Sponsors, Relative to Standard Shipping, Fiscal Years 2007-2012

	Prepositioning regression	Domestic and overseas prepositioning regression
Coefficients and standard errors for prepositioning		
Prepositioning (domestic or overseas)	-66.788***	
Standard error	<4.445>	
Domestic prepositioning		-61.912***
Standard error		<6.301>
Overseas prepositioning		-72.910***
Standard error		<4.726>
Sample size	1010	1010
Adjusted R squared	0.64	0.64
Coefficients of other control variables		
Freight forwarder		
Freight Forwarder 1	Dropped	Dropped

Appendix II: Delivery Time Frames Regression Analysis

	Prepositioning regression	Domestic and overseas prepositioning regression
Freight Forwarder 2	-119.973***	-123.149***
Freight Forwarder 3	36.516***	35.071***
Cooperating sponsor		
CARE	Dropped	Dropped
Catholic Relief Services	181.208***	182.788***
Government of Pakistan	-17.235	-17.975
Norwegian People's Aid	46.588***	42.273***
Relief Society of Tigray	63.317***	62.116***
SHARE Guatemala	76.939***	76.419***
Save the Children	-11.008**	-10.411**
Save the Children - United Kingdom	35.602**	34.279**
Discharge ports		
Jomi, Tajikistan	Dropped	Dropped
Addis Ababa, Ethiopia	47.108***	47.365***
Bujumbura, Burundi	153.000***	153.000***
Chittagong, Bangladesh	23.739**	23.370**
Corinto, Nicaragua	-51.946***	-51.695***
Dessie, Ethiopia	44.067***	45.072***
Dire Dawa, Ethiopia	23.175***	24.418***
Djibouti, Djibouti	16.804***	17.575***
Dushanbe, Tajikistan	-41.595**	-42.900**
Garm, Tajikistan	-9.79	-11.37
Gonaives, Haiti	-92.977***	-93.953***
Harare, Zimbabwe	10.627	18.830*
Kombolcha, Ethiopia	26.080***	27.132***
Kur-Tiube, Tajikistan	5.991	4.505
Les Cayes, Haiti	-21.876***	-23.158***
Mekele, Ethiopia	28.829***	30.218***
Mombasa, Kenya	12.519**	13.609***
Multiple destinations, Niger	51.022***	50.727***
Multiple destinations, Sudan	120.180***	118.659***
Multiple destinations, Zimbabwe	64.023***	65.813***
Nairobi, Kenya	43.667***	43.667***
Nazareth, Ethiopia	18.562**	19.793***
Port-Au-Prince, Haiti	-33.714***	-34.662***
Port Sudan, Sudan	13.667***	13.667***

Appendix II: Delivery Time Frames Regression Analysis

	Prepositioning regression	Domestic and overseas prepositioning regression
Santo Tomas, Guatemala	-54.899***	-55.877***
Segou, Mali	17.957**	14.550*
Shodecosa, Haiti	-53.898***	-54.770***
Woldiya, Ethiopia	61.329***	63.357***
Year of order		
Ordered 2006	12.691*	16.002***
Ordered 2007	41.919***	42.865***
Ordered 2008	32.387***	34.037***
Ordered 2009	40.613***	42.361***
Ordered 2010	25.187***	26.850***
Ordered 2011	32.450***	34.547***
Ordered 2012	Dropped	Dropped
Month of order		
Ordered January	Dropped	Dropped
Ordered February	-19.309**	-20.253**
Ordered March	7.177	7.217
Ordered April	-19.993***	-20.565***
Ordered May	-14.418**	-15.988**
Ordered June	-10.922	-12.936
Ordered July	-3.362	-5.401
Ordered August	-4.318	-5.577
Ordered September	23.483***	22.069**
Ordered October	18.902**	17.937**
Ordered November	23.542*	23.791*
Ordered December	-0.257	-1.333
Commodity		
Beans	Dropped	Dropped
Bulgur	2.23	2.624
Corn soya blend	2.288	2.621
Lentils	1.028	1.553
Maize	-20.599***	-22.827***
Peas	1.483	1.175
Rice	6.563***	6.810***
Sorghum	-32.716***	-32.758***
Vegetable oil	-22.292***	-21.729***
Wheat	-43.782***	-44.036***

Appendix II: Delivery Time Frames Regression Analysis

	Prepositioning regression	Domestic and overseas prepositioning regression
Wheat flour	11.16	11.567
Bulk/packaged commodity	-11.237**	-11.298**

Source: GAO analysis of cooperating sponsors' freight forwarders' data.

Notes:

In each category of control variables, one variable is dropped from the regression to serve as the comparison group for the other dummy variables in that category. Other variables may also be dropped due to insufficient number of shipments.

* = significant at the 10 percent significance level.

** = significant at the 5 percent significance level.

*** = significant at the 1 percent significance level.

Food Aid Diversions

To isolate the effect of diverted shipments on the delivery time frame of emergency food aid, we estimated ordinary least squares regression models that control for characteristics of diverted shipments, prepositioning shipments, and standard shipments. Table 11 shows the results of our regression analysis, demonstrating the average number of days saved by diversions relative to standard shipping time frames. Specifically, we estimate $Y_i = \alpha + \beta_1 Divert_i + \beta_2 DomesticPrepo_i + \beta_3 OverseasPrepo_i + \delta X_i + \epsilon_i$ for the second column, where Y_i is the delivery time frame of shipment i ; $Divert_i$ is a dummy for when shipment i is diverted; $DomesticPrepo_i$ is a dummy for when shipment i is from domestic prepositioning; $OverseasPrepo_i$ is a dummy for when shipment i is from overseas prepositioning; and X_i are the control variables listed in column 1.¹² We clustered the standard errors by the discharge port or recipient country. We include the freight forwarder, the cooperating sponsor, the discharge port or recipient countries, the year of the commodity request, the month of the commodity request, and the commodity type. These variables are known to USAID when cooperating sponsors submit requests for commodities.¹³ Controlling for these variables allowed us to compare shipments fulfilling requests with the

¹²These regression results are robust to removing outliers and influential shipments. Removing the slowest and fastest shipments and influential shipments yields similar regression results.

¹³Cooperating sponsors' requests also include the tonnage requested. However, USAID decides how much tonnage to include in each shipment when it decides whether to source the shipment from the standard shipping process or prepositioned warehouses. USAID may source part of the request from food aid diversions and the rest from the standard shipping process.

same characteristics. We did not control for the shipment’s tonnage, the port of loading, and other variables that USAID determines when deciding whether to fulfill a sponsor’s request with commodities sourced from the standard shipping process or with food aid diversions.¹⁴

Table 11: Estimated Days Saved by USAID’s Diversion of Prepositioning Emergency Food Aid Shipments, Relative to Standard Shipping, Fiscal Years 2007–2012

	Diversion, domestic, and overseas prepositioning regression
Coefficients and standard errors for prepositioning and diversion	
Diversion	-63.885***
Standard error	<11.023>
Domestic prepositioning	-68.780***
Standard error	<7.073>
Overseas prepositioning	-72.867***
Standard error	<5.883>
Sample size	1648
Adjusted R squared	0.71
Coefficients of other control variables	
Freight forwarder	
Freight Forwarder 1	Dropped
Freight Forwarder 2	10.446
Freight Forwarder 3	16.281
Cooperating sponsor	
ACDI/VOCA	Dropped
Adventist Development and Relief Agency	-30.571***
CARE	-3.332
Counterpart International	-6.686
Catholic Relief Services	24.096
Feed the Hungry	40.335***
Government of Pakistan	-19.811*
Norwegian People’s Aid	30.096

¹⁴We estimated models controlling for the shipment’s tonnage and the flag of the ocean vessel which yielded similar regression results.

Appendix II: Delivery Time Frames Regression Analysis

	Diversion, domestic, and overseas prepositioning regression
Relief Society of Tigray	35.514**
SHARE Guatemala	48.243***
Save the Children	-17.524**
Save the Children - United Kingdom	10.192
UNICEF	-25.773
WFP	9.039
World Vision	24.761**
Discharge ports	
Addis Ababa, Ethiopia	Dropped
Aqaba, Jordan	-9.877
Bangkok, Thailand	-31.090***
Beira, Mozambique	-23.063***
Bujumbura, Burundi	110.909***
Calcutta, India	-10.841
Chittagong, Bangladesh	-16.858**
Colombo, Sri Lanka	-48.876***
Corinto, Nicaragua	-73.778***
Cotonou, Benin	-37.861***
Dakar, Senegal	-94.186***
Dar Es Salaam, Tanzania	-30.353***
Dessie, Ethiopia	-0.695
Dire Dawa, Ethiopia	-22.083***
Djibouti, Djibouti	-53.199***
Douala, Cameroon	-42.541***
Doutchi, Niger	19.166**
Durban, South Africa	-31.926***
Dushanbe, Tajikistan	-58.383***
Garm, Tajikistan	-25.068*
Gonaives, Haiti	-125.847***
Harare, Zimbabwe	-49.705***
Kampala, Uganda	-42.091***
Karachi, Pakistan	-46.621***
Kombolcha, Ethiopia	-19.891***
Kur-Tiube, Tajikistan	-11.474
Laffiteau, Haiti	-125.802***

Appendix II: Delivery Time Frames Regression Analysis

	Diversion, domestic, and overseas prepositioning regression
Las Palmas, Canary Islands	-44.887***
Les Cayes, Haiti	-55.181***
Lome, Togo	-53.503***
Mekele, Ethiopia	-16.300***
Mombasa, Kenya	-32.409***
Monrovia, Liberia	-26.006***
Multiple destinations, Niger	9.328
Multiple destinations, Sudan	85.267***
Multiple destinations, Zimbabwe	18.261***
Nairobi, Kenya	1.575
Nampo, North Korea	-45.988***
Nazareth, Ethiopia	-24.744***
Nouakchott, Mauritania	-95.186***
Port-Au-Prince, Haiti	-81.237***
Port Sudan, Sudan	-28.425***
Port Qasim, Pakistan	-57.161***
Santo Tomas, Guatemala	-86.743***
Segou, Mali	-29.550***
Shodecosa, Haiti	-75.984***
Tanout, Niger	-4.354
Tema, Ghana	-39.412***
Woldiya, Ethiopia	12.5
Yemen	-45.658***
Year of order	
Ordered 2006	1.175
Ordered 2007	27.133***
Ordered 2008	13.920*
Ordered 2009	20.852***
Ordered 2010	12.236*
Ordered 2011	14.157**
Ordered 2012	Dropped
Month of order	
Ordered January	Dropped
Ordered February	-11.198**
Ordered March	-2.652

Appendix II: Delivery Time Frames Regression Analysis

	Diversion, domestic, and overseas prepositioning regression
Ordered April	-14.918**
Ordered May	-9.713**
Ordered June	-9.365
Ordered July	-5.312
Ordered August	-2.149
Ordered September	30.048***
Ordered October	15.184***
Ordered November	5.523
Ordered December	2.506
Commodity	
Beans	6.556
Bulgur	5.425
Corn soya blend	5.597
Lentils	-14.277
Maize	6.924
Peas	10.011
Ready-to-use therapeutic food	-25.402**
Rice	-7.06
Sorghum	-37.349***
Vegetable oil	8.157
Wheat	-9.729**
Wheat flour	Dropped
Bulk/packaged commodity	10.446

Source: GAO analysis of cooperating sponsors' freight forwarders' data.

Notes:

In each category of control variables, one variable is dropped from the regression to serve as the comparison group for the other dummy variables in that category. Other variables may also be dropped due to insufficient number of shipments.

* = significant at the 10 percent significance level.

** = significant at the 5 percent significance level.

*** = significant the 1 percent level.

Appendix III: Examples of Additional Ocean Shipping Costs for Overseas Prepositioning

To derive examples of the additional cost of the second leg of ocean shipping for prepositioning, we first estimated the costs of shipping from the United States to the prepositioning warehouse in Djibouti and from the Djibouti warehouse to three discharge ports—Mombasa, Kenya; Dar es Salaam, Tanzania; and Beira, Mozambique—in fiscal year 2012. We then compared those estimates with the estimated cost of shipping from U.S. ports directly to the three ports. (See table 12).¹

Table 12: Illustrative Examples of Additional Costs for Ocean Shipping from Djibouti in Fiscal Year 2012, per Metric Ton

Discharge port	Estimated cost of shipping from United States to discharge port via Djibouti warehouse ^a	Estimated cost of shipping directly from United States to discharge port ^b	Estimated additional cost of shipping from Djibouti warehouse to discharge port ^c
Mombasa, Kenya	\$293	\$174	\$119
Dar es Salaam, Tanzania	322	173	149
Beira, Mozambique	300	172	129

Source: GAO analysis of USAID data.

^aTo estimate the cost of shipping from the United States to the discharge ports via Djibouti, we used average rates for shipments from U.S. ports to USAID's prepositioning warehouse in Djibouti and actual rates for shipments from the Djibouti warehouse to the discharge ports in fiscal year 2012.

^bTo estimate the cost of shipping directly from the United States to the discharge ports, we used average rates for such shipments in fiscal year 2012.

^cTo estimate the additional cost of shipping from the Djibouti warehouse to the discharge ports, we subtracted the estimated cost of shipping directly from the United States to the discharge ports from the estimated cost of shipping from the United States to the discharge ports via Djibouti.

¹We selected these three routes as illustrative examples to demonstrate how the second leg of transportation can represent an additional cost. In some cases, costs associated with the second leg of ocean shipping, from a prepositioning warehouse to a discharge port, might not be the same as the reconstructed cost differential.

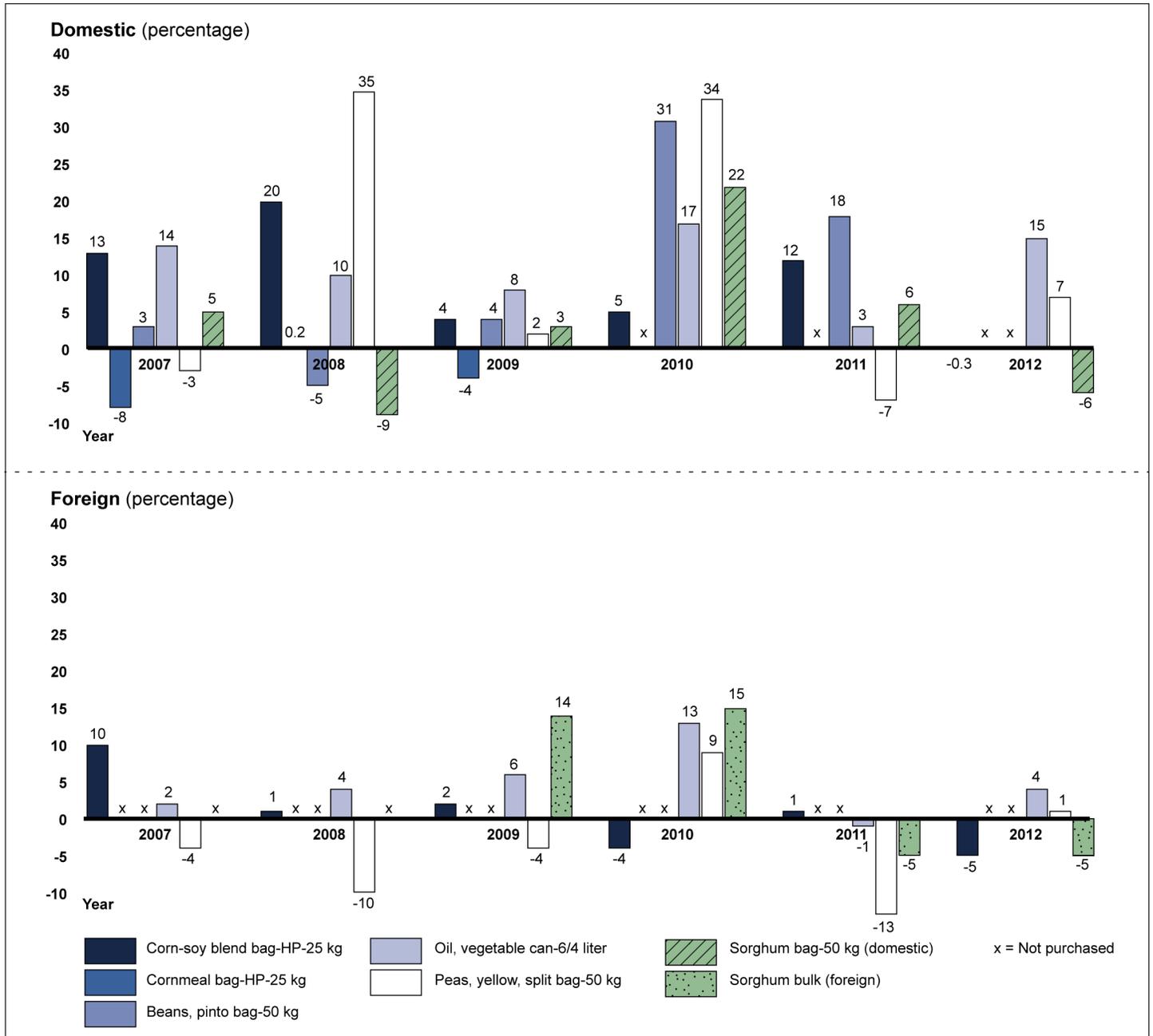
Appendix IV: Analysis of Weighted Annual Average Prices for Domestic and Overseas Prepositioned Commodities

To identify additional commodity costs associated with USAID's domestic and overseas prepositioning of emergency food aid, we compared the weighted average annual prices paid for six key prepositioned commodities with the weighted average annual prices paid for each of those commodities for standard shipments of emergency food aid in fiscal years 2007 through 2012. We found that, relative to standard shipments, the weighted average annual prices were higher relative to standard shipments for domestically prepositioned commodities more often than for overseas prepositioned commodities.

As figure 3 shows, for domestically prepositioned commodities, the weighted average annual prices were higher relative to standard-shipment commodities in 24 instances and lower in 8 instances. For overseas prepositioned commodities, the prices relative to standard-shipment commodities were higher in 13 instances and lower in 9 instances. Additionally, the size of the percentage differences between prices for prepositioned commodities relative to standard-shipment commodities was generally larger for domestic prepositioning than for overseas prepositioning. For domestically prepositioned commodities, the difference exceeded 15 percent in 7 instances; for overseas prepositioned commodities, the difference reached 15 percent in only one instance. Weighted annual average prices were consistently higher for two domestically prepositioned commodities, corn-soy blend (2007-2011) and vegetable oil (2007-2012).

Appendix IV: Analysis of Weighted Annual Average Prices for Domestic and Overseas Prepositioned Commodities

Figure 3: Percentage Differences between Weighted Annual Average Prices for USAID's Domestically and Overseas Prepositioned Commodities Relative to Standard-shipment Commodities, Fiscal Years 2007-2012



Source: GAO analysis of USAID data.

Appendix IV: Analysis of Weighted Annual Average Prices for Domestic and Overseas Prepositioned Commodities

Notes:

The graph shows the percentage differences between the weighted annual average prices per ton for six key prepositioned commodities and the weighted annual average prices per ton for the same standard-shipment (i.e., nonprepositioned) commodities purchased in the same year. A percentage difference higher than 0 indicates a higher weighted average price for the prepositioned commodity than for the standard-shipment commodity. A percentage difference lower than 0 indicates a lower weighted annual average price for the prepositioned commodity than for the standard-shipment commodity.

The listed commodities represented 76 percent of commodities purchased for domestic prepositioning in fiscal years 2007 through 2012.

To further examine price differentials between prepositioned and standard-shipment commodities, we analyzed the number of purchases per year in fiscal years 2007 through 2012. For commodities that the U.S. government purchased infrequently, the differences in the average prices might be a result of monthly commodity price fluctuations. For example, the U.S. government made only one purchase of pinto beans in 2008 and two purchases in 2009 for domestic prepositioning. In comparison, there were 81 purchases of pinto beans in 2008 and 75 in 2009 for standard shipments. Table 13 lists the numbers purchases for domestic prepositioning and for standard shipment in fiscal years 2007 to 2012.

Table 13: Numbers of Domestic Prepositioning and Standard Shipment Purchases for Six Key Commodities, Fiscal Years 2007-2012

		2007	2008	2009	2010	2011	2012
Pinto beans (50 kg bag)	Domestic prepositioning	9	1	2	24	20	0
	Standard shipment	75	81	75	30	15	37
Corn-soy blend (25 kg bag)	Domestic prepositioning	6	14	9	7	11	2
	Standard shipment	117	62	68	62	54	44
Cornmeal (25 kg bag)	Domestic prepositioning	20	25	12	0	0	0
	Standard shipment	195	89	100	67	65	57
Vegetable oil (6/4 liter can)	Domestic prepositioning	5	10	12	7	5	3
	Standard shipment	159	132	76	65	62	49
Yellow split peas (50 kg bag)	Domestic prepositioning	12	7	15	7	8	17
	Standard shipment	114	146	135	96	93	127
Sorghum (50 kg bag)	Domestic prepositioning	2	4	6	2	3	1
	Standard shipment	6	3	7	5	7	5

Source: GAO analysis of USAID data.

Note: The listed commodities represented 76 percent of commodities purchased for prepositioning in fiscal years 2007 through 2012.

Appendix V: Related GAO Products about International Food Aid

These products can be downloaded from the links shown or can be found on the GAO website at <http://www.gao.gov> .

Global Food Security: USAID Is Improving Coordination but Needs to Require Systematic Assessments of Country-Level Risks. [GAO-13-809](#). Washington, D.C.: September 17, 2013. E-supplement [GAO-13-815SP](#) .

International Food Assistance: U.S. Nonemergency Food Aid Programs Have Similar Objectives but Some Planning Helps Limit Overlap. [GAO-13-141R](#). Washington, D.C., December 12, 2012.

International Food Assistance: Improved Targeting Would Help Enable USAID to Reach Vulnerable Group. [GAO-12-862](#). Washington, D.C.: September 24, 2012.

World Food Program: Stronger Controls Needed in High-Risk Areas. [GAO-12-790](#). Washington, D.C.: September 13, 2012.

Farm Bill: Issues to Consider for Reauthorization. [GAO-12-338SP](#) . Washington, D.C.: April 24, 2012.

International Food Assistance: Funding Development Projects through the Purchase, Shipment, and Sale of U.S. Commodities Is Inefficient and Can Cause Adverse Market Impacts. [GAO-11-636](#). Washington, D.C.: June 23, 2011.

International Food Assistance: Better Nutrition and Quality Control Can Further Improve U.S. Food Aid. [GAO-11-491](#). Washington, D.C.: May 12, 2011.

International School Feeding: USDA's Oversight of the McGovern-Dole Food for Education Program Needs Improvement. [GAO-11-544](#). Washington, D.C.: May 19, 2011.

International Food Assistance: A U.S. Governmentwide Strategy Could Accelerate Progress toward Global Food Security. [GAO-10-212T](#) . Washington, D.C.: October 29, 2009.

International Food Assistance: Key Issues for Congressional Oversight. [GAO-09-977SP](#) . Washington, D.C.: September 30, 2009.

International Food Assistance: Local and Regional Procurement Can Enhance the Efficiency of U.S. Food Aid, but Challenges May Constrain Its Implementation. [GAO-09-570](#). Washington, D.C.: May 29, 2009.

International Food Security: Insufficient Efforts by Host Governments and Donors Threaten Progress to Halve Hunger in Sub-Saharan Africa by 2015. [GAO-08-680](#). Washington, D.C.: May 29, 2008.

Foreign Assistance: Various Challenges Impede the Efficiency and Effectiveness of U.S. Food Aid. [GAO-07-560](#). Washington, D.C.: April 13, 2007.

Appendix VI: Comments from the U.S. Agency for International Development

GAO received USAID letter on February 25, 2014.



Thomas Melito
Director, International Affairs and Trade
U.S. Government Accountability Office
Washington, DC 20548

Dear Mr. Melito:

I am pleased to provide USAID's formal response to the Government Accountability Office (GAO) draft report entitled "International Food Aid: Prepositioning Speeds Delivery of Emergency Aid, but Additional Monitoring of Time Frames and Costs Is Needed" (GAO-14-227).

This letter, together with the enclosed USAID comments, is provided for incorporation as an appendix to the final report.

Thank you for the opportunity to respond to the GAO draft report and for the courtesies extended by your staff in the conduct of this audit review.

Sincerely,

A handwritten signature in blue ink, appearing to read "Angelique M. Crumbly".

Angelique M. Crumbly
Assistant Administrator
Bureau for Management
U.S. Agency for International Development

Enclosure: a/s

- 2 -

USAID COMMENTS ON GAO DRAFT REPORT
No. GAO-14-227

Recommendation 1: To strengthen USAID's ability to ensure that its food aid prepositioning programs meet the goal of reducing delivery time frames in a cost-effective manner, we recommend that the Administrator systematically collect, and ensure the reliability and validity of, data on delivery time frames for all emergency food aid shipments, including prepositioned food aid shipments.

We agree with this recommendation. Therefore, USAID's Office of Food for Peace (FFP) is currently reviewing what actions will be needed to ensure that reliable data for delivery time frames for all emergency time frames are collected from cooperating sponsors, including the modification of current contracts, transfer authorizations, and/or cooperative agreements.

Recommendation 2: To strengthen USAID's ability to ensure that its food aid prepositioning programs meet the goal of reducing delivery time frames in a cost-effective manner, we recommend that the Administrator systematically monitor and assess data on delivery time frames for prepositioned food aid shipments.

Recommendation 3: To strengthen USAID's ability to ensure that its food aid prepositioning programs meet the goal of reducing delivery time frames in a cost-effective manner, we recommend that the Administrator systematically monitor and assess costs associated with commodity procurement, shipping and storage for prepositioned food aid shipments.

USAID agrees with these recommendations and is taking the following actions. FFP recently awarded a contract for the independent evaluation of the prepositioning program; the scope of this evaluation includes both timeliness and cost-effectiveness of prepositioning activities. Information and recommendations from the independent evaluation, the USAID Office of Inspector General's Audit of USAID's Internal Controls Over Prepositioned Food Assistance for the Horn of Africa, and this GAO report will inform the ongoing revision to FFP's strategy for the prepositioning program. This document will provide a framework for the monitoring and assessment of data on the timeliness and cost effectiveness of the prepositioning program.

Appendix VII: GAO Contact and Staff Acknowledgments

GAO Contact

Thomas Melito, (202) 512-9601 or melitot@gao.gov

Staff Acknowledgments

In addition to the contact named above, Valérie Nowak (Assistant Director), Farahnaaz Khakoo-Mausel, Teresa Abruzzo Heger, Ming Chen, Fang He, Rhonda Horried, Carol Bray, Martin De Alteriis, Justin Fisher, Mark Dowling, Reid Lowe, Todd Anderson, Sushmita SriKanth, John O'Trakoun, Barbara Shields, Patrick Hickey, Gergana Danailova-Trainor, Gezahegne Bekele, and Etana Finkler made key contributions to this report.

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