



Séminaire du CIRRELT Seminar

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## NETWORK PLANNING FOR AID SUPPLY DISTRIBUTION IN EAST AFRICA

**Abstract:** In East Africa, annual weather patterns cause recurrent shocks that expose populations to food insecurity and famines. In some regions, seasonal droughts create regular food shortages that are mitigated through sustained food aid. Armed conflicts across the region, populations' health and economic vulnerabilities also compound crises and trigger the need for humanitarian assistance. During this presentation, different research projects related to logistics decision planning for mitigating the consequences of such issues will be presented. The first studies that will be presented concern the design of a two-stage storage network for aid supply in East Africa and transportation procurement in the context of food aid distribution in Ethiopia. The objective of the other study that will be presented is to design an effective last-mile food aid distribution network in such a context. It is based on the food aid distribution problem arising in the region of Garissa in Kenya, but the methodology that it introduces is of general applicability in humanitarian logistics. We present a location model to determine a set of distribution centers from which the food is directly distributed to the beneficiaries. Our model considers the welfare of all stakeholders involved in this regional response system: the World Food Programme, the Kenya Red Cross, and the beneficiaries. We describe how need assessment and population data were combined to determine the food distribution requirements. We also show how GIS data describing the road network was used to establish a set of potential distribution centers and to evaluate transportation costs. In addition to the results obtained by solving our primary model, we present variants of the basic covering model and several comparative analyses to illustrate the trade-offs between the objectives of the different stakeholders. Finally, future research directions are presented and discussed.

**Note:** Marie-Ève Rancourt is assistant professor of operations management at the Business School of UQÀM since August 2012. She is also affiliated with CIRRELT, the Massachusetts Institute of Technology (MIT), and member of the Canadian Research Institute on Humanitarian Crisis and Aid (OCCA). Her research interests are in the areas of transportation systems and humanitarian logistics using techniques based on operations research.

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