ENHANCING THE EFFECTIVENESS AND EFFICIENCY OF FOOD ASSISTANCE SUPPLY CHAINS: AN ECONOMIC OPTIMIZATION MODEL FOR USAID FOOD FOR PEACE PROGRAM'S OPERATIONS IN ETHIOPIA

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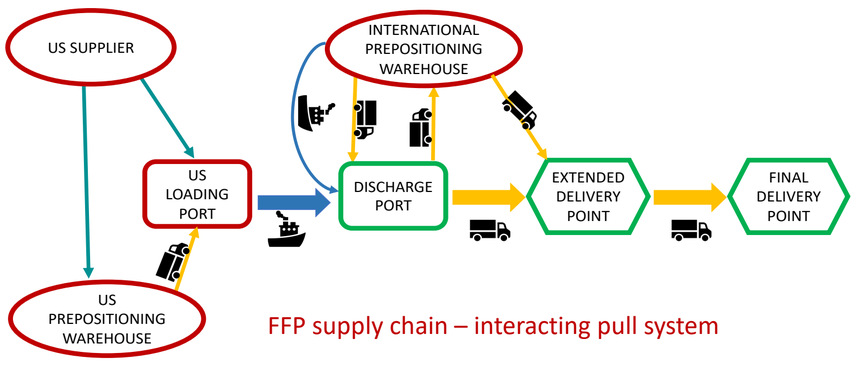
INTRODUCTION

Conceptual Supply Chain Flows for USAID Commodities



FFP supply chain – interacting pull system

USAID/USDA Decisions
PVO Decisions
: Inland transportation cost
: Ocean transportation cost
: Ocean transportation
: Road transportation
: Road transportation with no cost

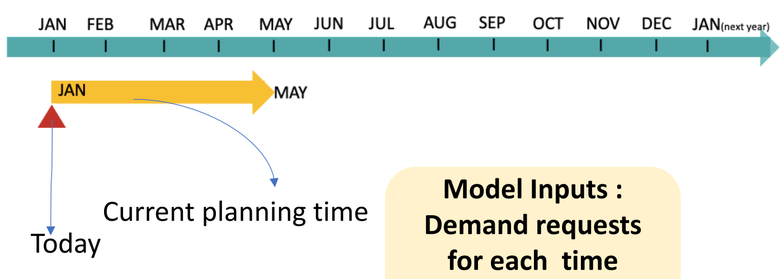
Aim of the study is to provide actionable recommendation to improve the efficacy and efficiency of the United States Agency of International Development (USAID) Office of Food For Peace (FFP) in-kind food aid operations.

In-country food assistance distribution network, Somali Region, Ethiopia

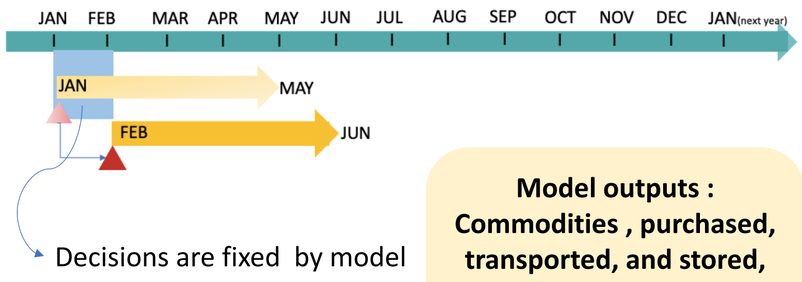
:Discharge Port :International Warehouse :Extended Delivery Point :Final Delivery Point

METHODOLOGY

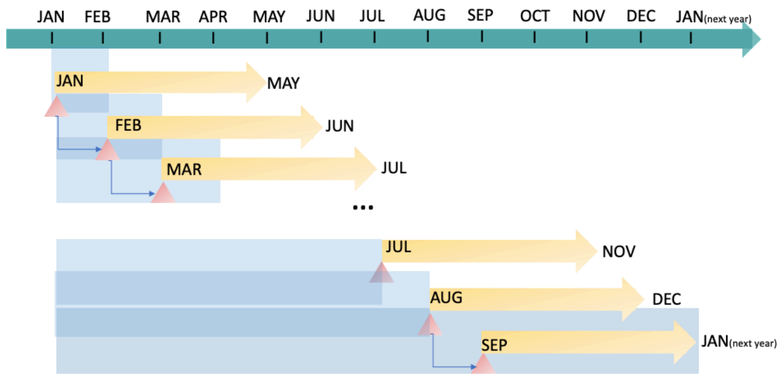
Periodical Decision Making : Rolling Horizon Algorithm



Model Inputs : Demand requests for each time interval.

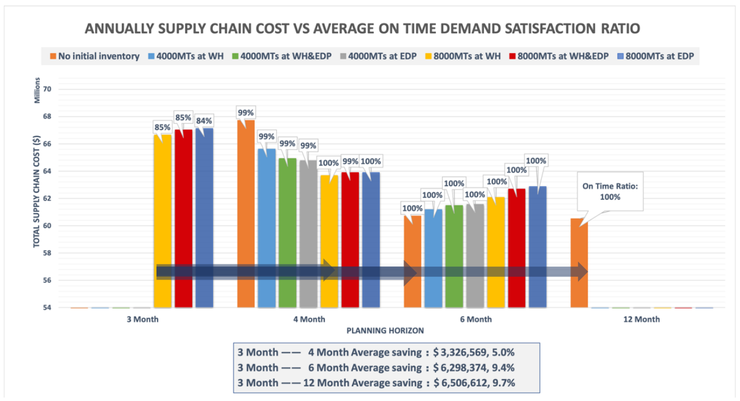


Model outputs : Commodities , purchased, transported, and stored, plus beginning/ending inventories.



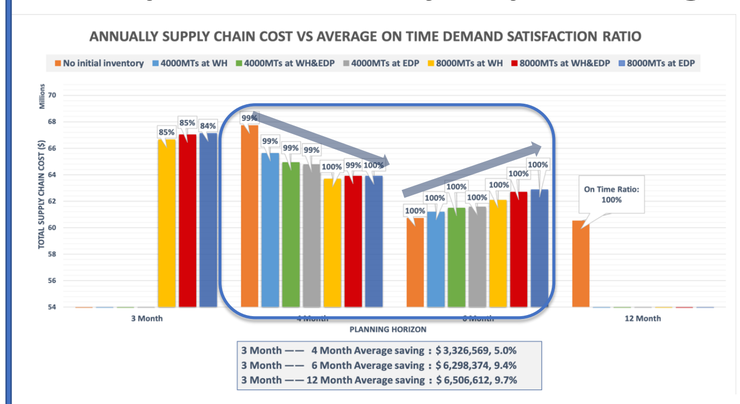
RESULTS

Impact of Demand Visibility



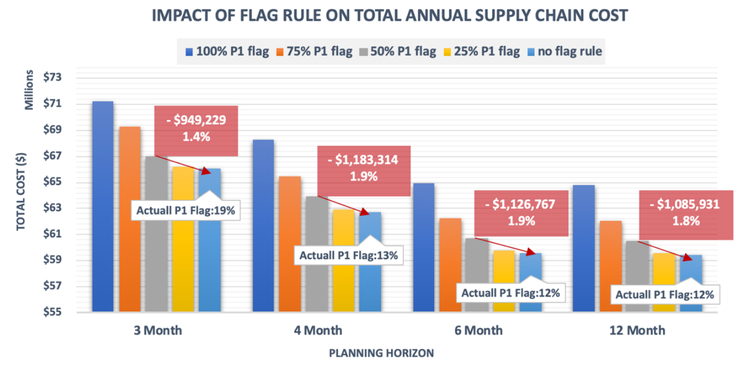
- USAID current demand visibility is approximately 3 months
- Extend demand visibility to at least 6 months:
  - ✓ Potentially leading up to 10% operational cost savings
  - ✓ Achieving 100% average on time delivery ratio

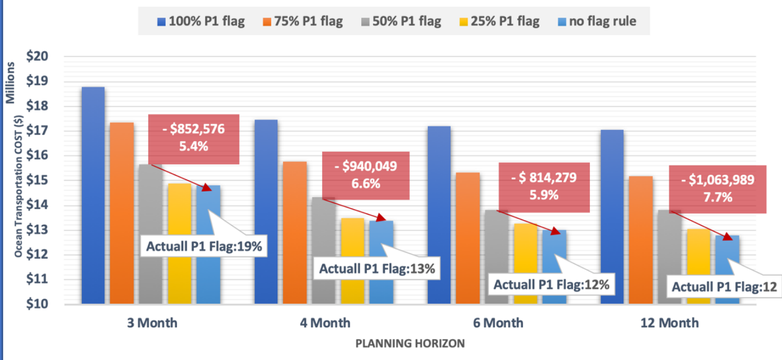
Impact of Inventory Prepositioning



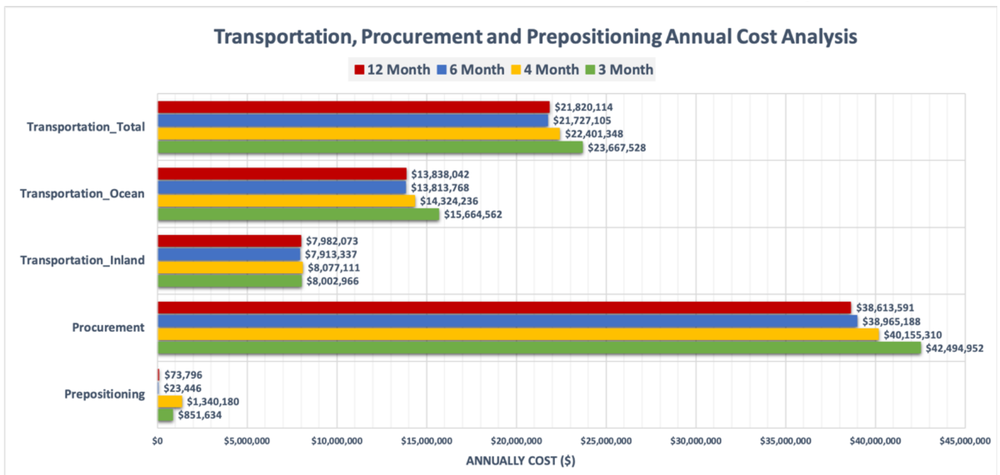
- Within 4 months (shorter) demand visibility: larger amount of prepositioned commodities are desired and beneficial
- Within 6 months (longer) demand visibility (total supply chain lead time is less) : simply carry efficient operations by pipeline inventory.

Impact of Flag Rules





Total Cost Decomposition



- Cost decomposition fit in with data assumption and historical data analysis
  - ✓ Inland transportation cost does not vary due to limited data
  - ✓ Cost component:
    Highest percentage – Procurement
    Lowest percentage – Prepositioning

- USAID has to use US flagged vessels on ocean shipping Additional cost saving can be gained by:
  - ✓ Reconstruct to whole year criteria (instead of applying to each planning time)
  - ✓ Relaxation on ocean transportation percentage of US flag.

POLICY IMPLICATIONS & CONCLUSION

Taking advantage of seasonality cost swings of procurement and ocean transportation by extending demand visibility and allowing proper level of commodity prepositioning

Extending demand visibility and allowing prepositioning , independently and jointly, improve the on-time demand satisfaction

Reducing the status quo of US- carrier flag rule from 50% to reduce ocean transportation cost

Making investments in data collection and data management is vital

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