The Logistics Performance Evaluation Model for the Delivery of Cash and Voucher Assistance in the Humanitarian Setting

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***Abstract*— Humanitarian operations continue to grow through the delivery of Cash and Voucher Assistance (CVA) programs. While the cost-efficiency and effectiveness of delivering CVA programs remain the backbone of any humanitarian assistance program, the performance of logistical aspects of such programs is neglected in the research. The purpose of this study is to determine the key logistics-related indicators to include in the evaluation of CVA programs in the humanitarian setting. The paper uses the qualitative approach by reviewing both grey and academic literature to determine the key related indicators from the logistical standpoint. A set of logistics indicators are determined and evaluated associated with the logistics of CVA programs. Some hidden costs are observed that are worthwhile considerations. The research provides empirical insights to the body of knowledge for humanitarian practitioners when they plan to measure the cost-efficiency and effectiveness of CVA considering the logistics-related metrics. The research findings contribute to the body of humanitarian logistics and CVA studies.**

Keywords*— *Humanitarian Logistics, Cost-Efficiency, Effectiveness, Cash and Voucher Assistance (CVA), Disasters

I. INTRODUCTION

With unprecedented levels of humanitarian needs due to unresolved crises in more countries as a result of the ongoing impact of the recent pandemic and climate change, it is more important than ever to provide assistance in a more effective and efficient way [1–4]. Global funding for Cash and Voucher Assistance (CVA) has increased significantly, peaking at USD$5.3 billion in 2021, a 3.7 percent increase from 2020. CVA programs accounted for 21% of total humanitarian assistance in 2021, and the majority of this assistance continued to be provided as cash (71%) as opposed to in-kind assistance (29%) [5].

Although CVA still only accounts for a smaller portion of the share of all humanitarian assistance, there have been calls for expansion of CVA, particularly for unconditional and multi-purpose cash assistance in larger-scale programs, thus making CVA a central component of all disaster response planning and programming. CVA program (as a complement or alternative to in-kind assistance) also has been a topic of interest in the humanitarian logistics and supply chain literature and among the network of humanitarian practitioners [6]. Prior research demonstrates that if CVA is well-designed, it can be more effective, efficient, and acceptable to beneficiaries (i.e. aid recipients) than in-kind assistance [7,8]. CVA can empower aid recipients and provide them with a choice in how best to meet their basic needs [9]. More recently, CVA has been regarded as being more operationally efficient and successful than traditional in-kind assistance since they don't require intensive logistics burdens such as transportation, storage, and distribution services [7]. Humanitarian organizations, thus, increasingly use CVA programs as a supplement or substitute for in-kind aid distribution.

Logistics plays a significant role in the implementation of cash and voucher assistance in humanitarian contexts, where certain activities across the cash operating cycle such as market assessment, contracting with and the selection of Financial Service Providers (FSP), as well as the distribution of cash and vouchers are main pillars of any successful CVA implementation [8]. For example, the implementing agency, International Organization for Migration (IOM), chose to proceed with the physical distribution of the vouchers for the first part of the program. This was executed by setting up distribution centres outside of the refugee settlements due to security concerns [10]. Despite the fact that the logistical demands of CVA are smaller than those of in-kind donations, logistical support remains the backbone of CVA interventions. This highlights the need for an effective and efficient supply chain that supports cash and voucher assistance programs in the humanitarian context. In fact, the logistics of CVA has been raised recently as one the main challenges in humanitarian operations, needing more academic research.

According to the Red Cross and Red Crescent Movement, the logistics plays a key role for the cost-efficient and effective delivery of CVA programs and it is a critical pre-requisite to the program at all stages, from the preparedness, to assessment, response /implementation to monitoring and evaluation phases. A timely engagement of logisticians across the cash operation cycle is not limited but includes 1) assessment (on needs, market supply, risk/security), 2) response (e.g., the selection and contracting with financial service providers, cash transfer/distribution), and 3) continuous monitoring and evaluation. Therefore, it is crucial to achieve a comprehensive understanding of the logistical tasks across phases of the cash operation cycle to address the needs of local affected communities. In terms of efficiency, following the largest humanitarian organization's guideline, IFRC, cost efficiency is a ratio comparing the total costs of different modalities and delivery mechanisms. To that note,

commonly, humanitarian organizations use the "cost-transfer ratio" to measure the cost-efficiency of CVA programs. The ratio is calculating the total cost including the delivery cost of CVA divided by the value of transfer (Grand Bargain Cash Workstream, 2019).

The objective is to minimize the total cost including the delivery costs. Obviously, having an optimal solution, minimizing the delivery cost and maximizing the effectiveness (e.g., coverage, speed, quality) can help humanitarian organizations to save cost compared to the total transfer value. The delivery costs are some part of logistic related including the beneficiary costs (travel cost to ATM), but also staff travel cost for the cash distribution. Logistics is also key to programme design, contributing to increasing the effectiveness of programs in terms of speed, scale and quality in delivering CVA programs in the humanitarian context.

Nonetheless, according to Tappis and Doocy [9], a lack of research exists to use the performance measurements for the implementation of CVAs such as total transfer costs, and administrative costs per program (e.g., set up costs, roll-out costs), and total operational costs. Even if that is not the case, the hidden logistical cost of, for example, the cost of relationship and contracting with FSP is neglected for the calculation. While there has been a small number of studies published on CVA, there has not been much work to understand what are the logistic-related indicators included for evaluating the performance of CVA programs in the humanitarian setting.

This study is aimed to determine a list of relevant indicators from logistics standpoints for cost-efficiency and efficiency of CVA programs. The indicators can be used as a supplementary guideline for monitoring and evaluating the performance of the CVA program's financial outlay from an operational logistics perspective. In this paper, we focus on determining the logistics-related indicators that underpin CVA programs; these are not limited to but do encompass, the most important building blocks in this approach (i.e., market assessment, FSP selection, and cash distribution). To achieve this goal, we employ a qualitative research strategy based on a review of logistics-related indicators that will be used or implemented to calculate the efficiency and effectiveness of the CVA program. To a large extent, the grey literature relies on publicly available guidelines and checklists published by well-respected international humanitarian organizations and networks (e.g., IFRC, CaLP).

The structure of the rest of the paper is as follows. Section 2 reviews CVA programs and the importance of logistics. Section 3 discusses the research method. Section 4 highlights the main findings from the literature. Finally, the main contributions of the study are discussed and future studies are discussed as a conclusion.

II. BACKGROUND

A. Cash and voucher assistance in humanitarian contexts

Cash and voucher assistance (CVA) refers to all programs where cash transfers or vouchers for goods or services are directly provided to recipients. In the context of humanitarian assistance, the term is used to refer to the provision of cash transfers or vouchers given to individuals, households or community recipients; not to governments or other state actors (CaLP, 2014). Existing research on CVA in humanitarian logistics largely focuses on comparing cash distributions with in-kind distributions and analysing the overall efficiency of cash-based humanitarian response [11,12]. For example, García Castillo [11] provided an analytical model to decide between CVA and in-kind distributions during emergency responses considering the needs of beneficiaries and market conditions.

Other streams of research such as Maghsoudi et al. [8] reviewed a number of research studies on cash and voucher assistance and concluded that a greater emphasis should be placed on the cost efficiency and implementation of cash during the preparedness and mitigation phases of disaster management. They also emphasized the fallacy that CVA removed logistic operations, whereas in fact these activities are transferred to other partners in the system, such as local producers and suppliers, as well as retailers. Similarly, Tappis and Doocy [9] presented a systematic review of the effectiveness and value for money of CVA programs.

CVA programs are considered more cost-efficient (in terms of logistics) than large-scale food distribution and thus CVA is suitable for a wider range of humanitarian contexts and emergency responses [9]. In-kind assistance requires tremendous logistical infrastructure to provide the goods and services rapidly and effectively. In fact, the evidence shows that about half of WFP's budget during the 2004 Indian Ocean tsunami was spent on logistics, with an estimate that the inefficiency cost of delivering direct food aid instead of cash transfers is at least 30%, and 50% more than local procurement.

Heaslip et al. [7] used a case study of conflict based in Palestine and discussed that cash and voucher can have signification cost reduction in emergency responses in terms of delivery and distribution of assistance. Likewise, Lewin et al. [13] refer to the World Food Program (WFP) pilot project in Ethiopia and posit that CVAs cut largely the supply chain cost by up to 25-30%, in comparison with in-kind assistance, and this is also mentioned by the previous scholars [14]. Based on a Ukrainian case study, Piotrowicz [12] determined that cash assistance can shorten the supply chain, reduce the cost of transportation and warehousing, and thus result in lower supply chain costs. Piotrowicz [12] refers to cash assistance and local procurement as the most cost-efficient mode of assistance in disaster recovery, while the author did not find any confirmation from the interviews with regard to the negative effects of CVA programs.

B. Efficiency and effectiveness of CVA programs

Generally speaking, evaluating the effectiveness and efficiency of different delivery modalities (in-kind, CVA, service and market support), and monitoring their performance over time, requires defining and developing measures to capture the success of aid delivery in the humanitarian context [15]. Compared to commercial supply chains, performance measurement in humanitarian supply chains is comparatively less established [16]. Existing performance measurement studies have predominantly focused on the supply chain and logistics operations, as logistics operations constitute the backbone of humanitarian operations [17]. This tendency, however, appears to be shifting toward more innovative evaluation methods, as the humanitarian logistics field places greater emphasis on cash and voucher assistance than on conventional in-kind assistance [8]. Aid in the form of CVA has grown more prevalent as a method of delivering aid to beneficiaries in recent years [8]. As a result of the increased usage of CVA, a

number of benefits have been gained, including lower logistical costs, the growth of local markets and economies, and enhanced aid quality.

The logistical performance indicators literature that focuses on the CVA operation is scarce, with the majority of the extant literature consisting of reports and white papers from humanitarian organizations (HOs). An example of HOs report that focuses on the CVA performance evaluation is the "Multipurpose Outcome Indicators and Guidance" developed by a group of humanitarian stakeholders in a participatory approach (The CALP Network). Other example includes the Cash-Logistics Key Performance Indicators proposed list by the International Federation of Red Cross and Red Crescent Societies (IFRC). The relatively scant literature has only lately begun to investigate the performance comparison and relative effectiveness and cost-efficiency of cash vs in-kind schemes in the context of humanitarian operations.

Overall, the current status of the literature on performance evaluation of CVA programs from logistical standpoints is sparse and fragmented. The lack of academic literature presents a unique opportunity as well as inherent hurdles for researchers looking into this subject with the goal of better understanding the improved cost-efficiency and effectiveness of the CVA program.

C. *Logistics related indicators for CVA programs*

Existing literature on the cost of logistics for evaluating the cost-effectiveness of CVA projects is scarce. The few studies that do exist compare the costs of various modalities and are often undertaken as part of disaster management or development research (cash, voucher and in-kind). For instance, Tappis and Doocy [9] determined that unconditional cash transfers have the lowest modality-specific of logistics costs per transfer, while the result may vary across the countries.

For example, in Ecuador, vouchers were found to have a slightly lower total cost per transfer ($0.41) than cash assistance. In Zimbabwe, cash assistance was identified to have a higher total cost per transfer ($0.03) than in-kid food distribution, while interestingly in Yemen, the total cost per transfer for in-kind assistance was more than triple that of cash transfers. Notwithstanding, the cost of procuring and producing ID cards was higher for cash than food assistance in Uganda, while in Yemen, HAs were required to manage the sensitization costs (e.g., cost of training and public awareness to make the beneficiaries aware of their program) for both types of modalities [18]. In all cases, the logistical costs are not separated but included in total operations costs.

Furthermore, Margolies and Hoddinott [18] defined the modality-specific costs as the combination and sum of logistics, materials and human resource costs, and thus the total cost per transfer is equal to total modality-specific costs divided by the total number of transfers distributed within the specified period of time during the cash project cycle (i.e., preparedness, design, market and need assessment, response and implementation, monitoring). [18] argued that the cost for administration, logistics and the total operational activities such as preparation for humanitarian staff travel, the execution of payments, and the post-monitoring distribution varied across the modalities. For instance, vouchers are the cheapest modalities in terms of materials used, services provided, transportation, and other non-staff costs, whereas human resource cost is large for vouchers compared to cash and in-kind assistance. For cash assistance, there was a slight balance between staff costs (about 40%) and logistics costs (about 60%). Overall, cash carries the least cost with $2.9 cost per transfer, voucher with $3.27 comes second and finally food assistance with $11.46 per transfer for the case of the Food crisis in Ecuador [18]. The results are further confirmed strongly by the work of Kelaher and Dollery [19] who arguably discussed the inefficiency cost of delivering direct in-kind assistance (at least 30% less efficient compared to cash assistance), and this is 50% more than the cost of procuring local food to the beneficiaries. Some scholars supported the importance of local procurement linking to CVAs (in terms of cash donations, microcredits, and vouchers), which can improve the overall supply chain performance [12,20,21]. However, there is still unclear how the total logistics cost of CVA is calculated and if that's the case what are the indicators to measure such delivery costs.

III. METHOD

The research method follows a qualitative approach by reviewing secondary data and organization reports in order to infer key findings. Secondary data includes a list of public documents published by established humanitarian organizations. The documents are filtered to those that only discussed the indicators in general and in particular to logistics. The main secondary data include 1) the CaLP database, 2) USAID, and 3) IFRC/ICRC guide on cash in emergencies. Some supplementary materials are also used to support the selection of indicators. The aim is to gain a comprehensive list of cost indicators including the delivery cost as the total cost of CVA programs.

IV. RESULTS

A. *The CVA logistics process*

In terms of operational mechanisms, cash and voucher assistance might take the shape of direct transfers of cash, vouchers, electronic vouchers, or micro-credits; they can also be unconditional or conditional based on the fulfilment of specified requirements criteria. Delivery methods can also vary, from direct cash or voucher delivery by humanitarian agencies or subcontractors (called the "cash-in-envelope method") to cash payments at bank or post office branches or other public places, to payments into bank accounts or e-wallets that can be accessed through ATM cards, Point-of-Sale (PoS) devices, or mobile phones. Each of these systems has its own prerequisites, benefits, and drawbacks. In order to select the optimal distribution mechanism, it is necessary to evaluate the program needs, market assessment, user registration requirements, the capacity and capabilities of the financial service providers, security and controls, cost-efficiency, and the quality of CVA programs. If there is no finances that can accommodate an agency's needs for implementing CVA or if the existing financial infrastructure is damaged by a crisis, agencies often distribute cash or vouchers, or in-kind physically to the beneficiaries. According to Harvey et al. [22] the method of directly distributing cash in envelopes to the beneficiaries is then a commonly preferred one. However, by technological advancement, physical cash distribution is not a priority whereas there are digital options such as mobile money.

TABLE 1. THE CVA LOGISTICS PROCESS INDICATORS

Process	Criteria	Indicators	Logistics related
Assessment	**Needs/demand**	- Total number of eligible beneficiaries to receive cash and voucher assistance	Congruent
	Market supply	- Percentage of key commodities by type with sufficient availability in local markets - Percentage of key commodities available in the local market that are judged of sufficient quality by project staff.	Congruent
	Financial services	- Number of pre-qualified financial service providers compared to the total number of available service providers.	Congruent
	Security & risk analysis	- Percentage of vouchers and cash (of total transfer value) fall into the hands of black-listed organisations/ individuals and armed conflict. - Percentage of cash transfers to ghost beneficiaries who did not meet selection criteria. - Ensuring security protocols of both recipients and distributors - Negotiate and secure access and establish security guarantees	Congruent
Response & Implementation	**Coverage**	- Total amount of cash transferred to beneficiaries versus the planned amount	Partly Congruent
	Transfer value	- Total monetary value of cash distributed (per year, region, country, program) (cost transfer ratio)	Partly Congruent
	Timeliness	- Setup speed of CVA distribution centres Percentage of payments made on time to schedule	Congruent
	Cost related to cash distribution	- Percentage of service fees compared to the transfer value (total average, per country) - Percentage of service fees per delivery mechanism (average, per, country)	Congruent
	Service provider's selection	- Percentage of FSP framework agreements in place - Percentage of procurements of cash through FSPs - Percentage of stakeholders who are satisfied with the framework agreement FSP performance	Congruent
Monitoring	**Beneficiary Satisfaction**	- Percentage of beneficiaries who report satisfaction.	Partly Congruent
	Beneficiary's needs fulfilment	- Percentage of beneficiaries who use cash to meet emergency needs.	Partly Congruent
	Market monitoring	- Number of traders/suppliers are monitored. - Number of responses to price changes.	Partly Congruent

Referring to the CVA guides, the logistics contributions for the CVA program can be divided into three connected phases assessment, response analysis/implementation and monitoring. For ease of categorization, we excluded preparedness as we assume that preparedness is a continuous learning process to improve the effectiveness and efficiency of delivering the CVA program in the humanitarian context.

B. The CVA logistics process indicators

Table 1 lists the CVA logistics process indicators categorized under three main processes: 1) Assessment, 2) Response & implementation, and 3) monitoring. In a broad sense, efficiency assessment is a metric that evaluates the ratio of output (qualitative and quantitative) obtained from a given set of resources. In general, this entails evaluating alternative approaches to obtaining an output to determine whether the most efficient approach was utilized.

The reviewed secondary data suggest that the indicators are designed mainly and suitable for multi-purpose cash assistance to cover multiple needs of beneficiaries in the multi-sector. Transfer values frequency and duration of support should be the key points in terms of performance (outcomes) measures. Transfer value equals the Minimum Expenditure Basket - real average resources of target households, to determine the level of unmet, expenditure-based needs. In practice, factors such as funding, government policies, and the objective of aligning with social assistance rates influence transfer values. When calculating the delivery cost for CVA, a set of criteria needs also be included; 1) type of activity -sector-specific (i.e., child protection, education, food security, health, NFIs, Nutrition, Shelter, WASH), 2) duration of amount, 3) the location and context where the program to be implemented.

It is important to note that these indicators can be specified by connecting to a particular activity or cluster (e.g., food security, shelter, telecommunication, protection). One of the key preconditions for which CVA is usually an appropriate response modality is that CVA can be delivered efficiently and effectively (value for money). Therefore, CVA may not be appropriate if the cost of delivering cash will be greater than its capacity to meet the needs identified in the program objective and if the cost of delivering assistance outweighs the benefits, alternative modalities should be considered (CaLP). Logistics has a supporting role in the implementation of CVA programs.

The aim is to draft the roles and connect the related indicators that can weigh the performance evaluation of logistics-related tasks for delivering CVA programs in the humanitarian context. Apart from that, there are also other cost-related factors within the programs that need to be considered logistically. Overall, the goal of these indicators is to enable effective and efficient assessment procedures that support the CVA objective of achieving the greatest number of eligible beneficiaries in the shortest amount of time and at the lowest feasible logistical cost. In this context, performance assessment is vital to understand how cash-based responses were efficiently and effectively employed, as well as to ensure that the cash-based intervention remains impactful.

V. DISCUSSION

The humanitarian relief sector is increasingly experiencing the use of cash and voucher assistance programs. Previous performance measurement studies were largely focused on in-kind operations [4,23]. In terms of the implications, humanitarian practitioners, particularly those working for

large humanitarian organizations and generally humanitarian actors who are actively operating in cash-based response, can make use of these indicators for their performance assessment from a process-oriented perspective with a special focus on the logistics of cash transfers. The indicators enable humanitarian organizations and practitioners to trace their operational performance in various stages from the point of origin to the point of consumption and monitoring the track of aid delivery. The indicators facilitate humanitarian organizations and practitioners to track their service quality across a multitude of phases, starting from the assessment of needs, market and security (logistics related), sorting, selection and contracting with qualified financial service providers and cash distribution, as all these activities are heavily logistics related tasks.

The main contribution of this study is providing a list of logistics-related indicators for the delivery of CVA programs as demonstrated in Table 1. Key indicators such as the total monetary value of eligible beneficiaries to receive cash/voucher, the total monetary value of cash/voucher distributed, and the total cost of logistics resources used to implement CVA assistance could all be factored into a logistics efficiency evaluation model for the delivery of cash and voucher assistance in the humanitarian setting. These indicators could be integrated as a formula whose weights can be adjusted by practitioners along the lines of Anjomshoae et al. [15] research. The formula can be used by humanitarian organizations decision makers to track and report on key performance indicators related to the evaluation of cash transfer logistics.

VI. Conclusion

Logistics plays a significant role in the implementation of cash and voucher assistance in humanitarian contexts, where the physical distribution of cash and vouchers is the predominant modality of cash and voucher distribution. The logistical aspect of CVA and its related performance metrics from a supply chain perspective have not been thoroughly understood in the humanitarian logistics literature. The limited literature that exists largely consists of organizational reports that offer little new theoretical insight. This research was a stepping stone towards understanding cash and voucher assistance logistics process metrics.

We reviewed the literature and utilized secondary data to determine CVA logistics process indicators. This research has implications for future studies that are focused on performance evaluation of cash-based international humanitarian interventions and logistics. Integrating monetary and logistical indicators into a logistics cost model for assessing the efficacy of the distribution of cash and vouchers in a humanitarian context provides unique challenges for future research. One of the limitations of this study is that the study relies on secondary data. We recommend further studies in the future to pilot, weight and exercise the key indicators determined as the result of the study. Real case studies are recommended to test the specified indicators.

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