



## Helpdesk Research Report

# Transporting materials to schools

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## Question

*Provide a literature review of various approaches to transporting books and curriculum materials to schools in low-resource and fragile settings.*

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## 1. Overview

Logistics and transportation of goods in developing countries is not widely covered in the literature, despite its importance in ensuring programme success. Most information on this topic comes from short sections in programme evaluations, with few papers dedicated to wider issues of transportation. Programme evaluations are necessarily more concerned with programme effectiveness and development outcomes, and do not provide rigorous evidence on what works for successful transportation and delivery.

Much of the literature on transportation comes from the health sector. Much of this is specific to health issues, such as the need to keep vaccines refrigerated, and does not have transferable lessons.

This report focuses on the literature on education transportation, which mostly looks at delivery of textbooks, not other materials, although other materials may be included in a textbook delivery programme. There are few examples of successful distribution programmes (Read, 2015: 170). The small literature is, however, relatively consistent. Most programmes have faced similar challenges and limitations, and have found transferable approaches to what works. These are:

- **Financing:** the burden of paying for delivery falls on different actors. The literature is clear that either the government or the publishers should cover the costs, but often it has been teachers who travel to warehouses and pay to collect school supplies.

- **Accessibility:** many countries experience problems in getting supplies through the ‘last mile’ to their final destination. Rains and difficult roads can prevent final delivery to rural and inaccessible areas. Appropriate vehicles and timing can overcome this. School stakeholders express a clear preference for supplies to be delivered directly to the school rather than having to collect them.
- **Partnerships:** commercial, NGO or school partnerships are a key factor in facilitating delivery. Some programmes have piggybacked on existing commercial organisations’ delivery systems to help deliver their goods; while others use local organisations to provide data and information on how best to operate. Publishers and booksellers are a key part of the supply chain. Cooperation with school stakeholders (teachers and parents) is essential for successful management.
- **Management systems:** there is often poor and unreliable data from end-to-end of the programme, including numbers of students in a school, numbers of materials produced, correct storage and stocktaking, monitoring of delivery and correct invoicing.
  - The most important part of the management system is providing an accurate and reliable **proof of delivery**. Programmes have used paper signoffs or photographs to verify receipt of goods. This proof forms the basis of payment-on-delivery models, which appear to be the most successful.
- The literature considered in this review was largely **gender-blind**, although one report raises that female teachers may not be able to collect books from warehouses and are reliant on male peers to help.

This review first summarises approaches and challenges common across the literature, then presents some case studies from Iraq, South Sudan, Pakistan, Zimbabwe, Kenya, Lesotho, Rwanda and Sierra Leone.

## 2. Approaches

### Warehousing

This is the most common distribution model found in the literature. Materials are stored in a large warehouse, often in the capital city, and smaller containers are sent out to provincial warehouses. Most programmes have used a network of distribution points, with mid-sized warehouses in regional hubs, and sometimes a third branch of storage points such as education officers’ homes. Usually large trucks can be used to transport materials to the provinces, as there are likely to be tarmacked roads (Zimbabwe Education Transition Fund (ZETF), 2011). Materials then may be moved into smaller vehicles for transport to the final destination. UNICEF Zimbabwe (ZETF, 2011) identifies that small and sturdy vehicles were more able to manage the terrain and road weight restrictions, especially during the rainy season.

### Centralisation

Centralised distribution is usually monopolised by the state, which determines the needs of schools, places orders to suppliers, and manages the delivery (Crabbe, Nyingi, & Abadzi, 2014). Governments will often use a central warehouse to store materials and send them out to provincial schools (Crabbe, Nyingi, & Abadzi, 2014). The literature on Sub-Saharan Africa suggests that this system is not effective, and often

results in delays, missing stock, and corruption. However, centralisation can work well in a very small country (Crabbe, Nyingi, & Abadzi, 2014).

In Zimbabwe, UNICEF chose to re-centralise distribution of school supplies (ZETF, 2011). This helped them maintain control of the distribution system, but was less cost-effective.

## **Public-private partnerships**

Decentralised distribution often involves the private sector (Crabbe, Nyingi, & Abadzi, 2014). Schools or districts can send their orders to publishers or other suppliers, which are delivered to the school and paid for by the school (Crabbe, Nyingi, & Abadzi, 2014). Distribution and delivery can be written into contracts of suppliers when tenders are awarded (Crabbe, Nyingi, & Abadzi, 2014). The World Bank study on textbooks in Sub-Saharan Africa suggests that public-private partnerships (PPPs) can help to improve distribution (Fredriksen, Brar & Trucano, 2015). PPPs can:

- Use the existing wholesale and retail book trade if it has the necessary capacity, national coverage, finance, and professionalism.
- Ask publishers to include distribution costs to schools in their tendered prices and pass the distribution burden to publishers.
- Tender school-level distribution to professional haulage companies.

This model works best where necessary infrastructure is in place and functions well, usually seen in a thriving publishing industry (Crabbe, Nyingi, & Abadzi, 2014).

## ***Delivery by publishers***

In Rwanda, using publishers for distribution resulted in 96 per cent delivery, as the publishers were not paid until they had demonstrated successful delivery (Fredriksen, Brar & Trucano, 2015). In Ethiopia, publishers deliver textbooks directly to Woreda Education Offices (district level) (Read, 2015). The instructions state that officers should unpack and repackage the books for distribution for individual schools, but there is no information on what happens to the stock beyond these offices (Read, 2015).

## ***Delivery by booksellers***

Booksellers are intermediary actors who buy books at a discount from publishers and sell them on to schools (Crabbe, Nyingi, & Abadzi, 2014). They are often working as individuals and can make direct visits to schools, carrying books from several publishers and supplementary materials such as stationary (Crabbe, Nyingi, & Abadzi, 2014). They do not usually have professional training and implementers sometimes view them as unnecessary middlemen and cut them out of programmes (Crabbe, Nyingi, & Abadzi, 2014). However, they can provide greater geographic reach than state delivery systems, improve efficiency of delivery and help foster a reading culture (Crabbe, Nyingi, & Abadzi, 2014).

In Kenya, the strong and professional retail book trade has proved an effective mechanism for school textbook distribution (Read, 2015: 166). Intermediary booksellers offer contracts to schools directly to deliver books. These often include discounts or free extras. Free delivery is a key incentive for schools. Schools reported that they preferred this system to state distribution, in particular, the ability to select books themselves, to negotiate the terms and conditions of supply and that booksellers were prepared to deliver in most cases direct to their premises and correct errors and damages quickly and efficiently.

Payments to booksellers were made only after correct delivery. This system does open the possibility of corruption, with some examples of schools demanding discounts to be provided in cash.

### ***Delivery through pre-existing networks***

There have been some occasions when large companies have helped distribute books using their pre-existing distribution networks (Crabbe, Nyingi, & Abadzi, 2014). Coca-Cola delivered books to remote villages in the Philippines. NGOs or CSOs may also be able to help deliver or track deliveries in the areas where they work. In South Sudan, DFID have collaborated with NGOs to help establish accurate information on the status of schools and needs, and have used NGO partners to help distribute or redirect books (DFID, 2014).

### ***Collection***

Staff, Parent-Teacher Associations (PTAs) or community organisations may be able to collect books from provincial warehouses (Crabbe, Nyingi, & Abadzi, 2014). PTAs may also be able to help monitor and are likely to have an investment in improving accountability, making them reliable partners.

## **3. Challenges**

### **Financing**

A recent study from the World Bank on textbooks in Sub-Saharan Africa (SSA) concludes that up to 50 or 60 per cent of textbooks are lost during transportation (Fredriksen, Brar & Trucano, 2015). Often this is because of underfunding, which limits the options to rent transport and results in books remaining in district warehouses. Read (2015) gives several examples from SSA where textbooks got as far as county offices but not to schools, due to lack of funding for onwards movement. The district level is commonly underfunded by central government (Read, 2015).

### **Capacity**

Distribution in SSA is usually managed by the state, although they do not necessarily have the expertise or facilities (Fredriksen, Brar & Trucano, 2015). Most countries lack management and monitoring systems to ensure supervision and accountability of delivery. Governments in SSA mostly have not had access to professional logistics and stock movement experts or systems (Read, 2015: 157). In Liberia, for example, Ministry of Education (MoE) staff working in procurement and in the warehouses have had little or no training, which means they are not following appropriate procedures (Read, 2015: 168). MoE staff were also not keeping appropriate documentation or records (Read, 2015: 168), something which is commonly noted across the literature.

### **Warehouses**

The World Bank studies on textbooks in Sub-Saharan Africa (Fredriksen, Brar & Trucano, 2015; Read, 2015) describe numerous problems with warehouse storage. It is very common for warehouses to have unsuitable environmental conditions for books, such as damp, dusty or infested with vermin, meaning books were damaged or destroyed. Several storage units do not have appropriate organisation systems, making it difficult to identify and track individual titles. Poor record-keeping and management add to this.

Warehouses were often under-capacitated, only able to process one or two consignments at a time, which incurs delays and possibly extra charges.

## Data

Several studies report programmes' reliance on Education Management Information System (EMIS) data. This provides the number of students enrolled and attending schools. In many cases this is provided by headteachers, and not verified independently (DFID, 2014). This data is often unreliable, which has a strong impact on the numbers of materials produced, delivered and utilised. DFID (2014) suggest that at the beginning of an EMIS it may be better to encourage accurate answers to a few important questions than try for a comprehensive overview of the school. In general, management systems for distribution are poor, and data is extremely unreliable from end-to-to-end of the delivery process.

## 4. Case studies

### Iraq

In 2003-2005, UNESCO ran a textbook revision and updating programme in Iraq (UNESCO 2005). The existing distribution system was exceedingly centralised, relying on a large warehouse in Baghdad. UNESCO conducted a survey of the capacity of local districts, which showed that regional warehouses needed to be refurbished and re-equipped. Before the programme could commence, the team made a financial assessment of how many learners would need books, based on enrolment rates and population increases.

Books were delivered to local governorate warehouses and picked up by local headmasters. As Department of Education trucks had largely been destroyed, stakeholders agreed that private transport from Baghdad to the governorates was necessary. UNESCO covered the headmasters' transport costs to and from the governorate warehouse. Headmasters completed questionnaires to assess their financial needs for this step of the programme, from which UNESCO derived an average payment of USD 18 for rural areas and USD 5 for urban areas. Printers were apprised of how many books they were expected to deliver to each warehouse in Baghdad, and each governorate was apprised of how many books to expect to be delivered.

Monitoring systems were in place to track delivery:

- A monitoring team of 14 Ministry of Education staff.
- Distribution of questionnaires to school headmasters to collect reliable information on school locations and the process of book distribution.
- A receipting system. Headmasters signed for pick-up of books and payment received for transporting them to schools.
- Survey of titles remaining in the warehouses, in preparation for the next school year's printing.

The programme identified a need for joined-up systems and decentralisation, to improve textbook distribution. UNESCO provided computer systems to the governorate warehouses, and satellite communications equipment with internet subscriptions. UNESCO also scanned all the educational materials to create a CD library, in case the hard copies were destroyed. The libraries are kept by the Minister, and a public library. After the distribution, no governorate reported lack of funds and one even managed to return surplus funds to UNESCO. UNESCO reports that 100 per cent of the textbooks reached the schools.

## South Sudan

The UK government runs a textbook printing and distribution project in South Sudan (DFID, 2014). It prints and distributes textbooks, dictionaries, and wallcharts to all schools registered with the government of South Sudan, and provides storage facilities in district education offices and plastic storage cabinets.

The rainy season meant that roads became impassable in August 2013 and some deliveries to particularly rural areas had to be delayed until December. Timing of delivery is therefore crucial, but there is a trade-off with the availability and expense of trucks for hire during the optimum freighting season. Containers occasionally had to be left in a different location and local teachers arranged to collect them when possible.

Outbreaks of conflict also affected the final deliveries, which had to be put on hold and staff withdrawn from the country. External consultants were brought in to conduct a feasibility assessment for completion of deliveries. They have collaborated with partner NGOs and other development actors to ascertain the condition of book containers and schools, and to establish means of continuing deliveries. Some containers were reassigned to Save the Children to distribute, and some have been redirected to IDP camps, with the proviso these should be returned to their intended schools as soon as possible. Record keeping and management is essential in order to track and control this process.

Wherever possible, the delivery company delivered books directly to schools. Education officers accompanied the delivery trucks, and provided delivery certificates to be signed by the headteacher. Additionally, the team took a photograph with a Global Positioning System (GPS) camera of the stock delivered with the school in the background and the GPS location automatically printed on the photograph. This provides proof of delivery and has also collected data on the exact GPS coordinates of schools.

## Pakistan

A mixed-methods evaluation provides empirical data on stakeholders' perceptions of a free textbook distribution scheme in Sindh, Pakistan (Qazi et al., 2010). A textbook demand list was given to the province publishing house to print the required quantities. The publishers supplied books to either a local warehouse or locally central school, and headmasters are informed for collection.

The final demand lists, prepared by district education officers and headmasters six months before the start of the school year, relied on projections about enrolment rather than actual numbers. This presented ambiguities in the real numbers required.

Books were kept in poor condition in the warehouses. They were not arranged in sets, and books went missing. Warehouse staff sometimes demanded bribes. Most stakeholders demanded in the evaluation that the publishers should send books straight to schools, without the need for storage and middlemen.

Delivery costs to local warehouses were paid by different stakeholders: 40 per cent were paid by the publishers; 34 per cent by local government; 10 per cent by education district officers. Headmasters and district education officers disagreed in the evaluation about who had actually paid the costs. Neither party received remuneration for transport costs. The responsibility for final delivery mainly rested with local government officers, but in practice, it was mostly teachers who collected the consignments and took them to their schools. This was easier for men than women, so girls' schools with all-female staff were dependent on male assistance to collect their books.

It is unclear whether books were received before the start of the academic year – 38 per cent of district education officers said students received the books before or within one week of the start of the academic

year; 61 per cent of the headmasters received the books one to three months post new school session; and 54 per cent of parents secured the textbooks at the beginning of the academic year. There appeared to be numerous delays in delivery, particularly for rural or remote schools. Early submission of demand lists does not appear to guarantee timely receipt.

## Zimbabwe

In 2009, the Government of Zimbabwe established the Education Transition Fund project to rebuild the primary education sector. UNICEF Zimbabwe managed the project, procuring and distributing stationery, textbooks and steel cabinets (in which to store the textbooks), to every school in the country (Zimbabwe Education Transition Fund, 2011).

The first step was a large-scale mapping exercise to locate schools and cluster them into delivery zones. District Education Officers visited each school and recorded its GPS coordinates. The mapping revealed new schools and higher enrolment rates than anticipated, so project numbers were revised upwards.

UNICEF chose to diversify its distribution strategy, in order to safeguard from any problems arising from a single service provider. UNICEF's own trucks delivered goods in a 150km radius around Harare, the capital city, while a private transport company delivered the remaining materials to regional hubs in large trucks, then to final destination in smaller trucks. Trucks had to be loaded in reverse, with the last delivery pallet loaded first, to ensure efficiency. As far as possible, trips were consolidated so that all materials to a single school were delivered in one batch. At each school the driver would verify the books with the head teacher. Throughout the process, quality control and monitoring was maintained at a high level. Invoices and proofs of delivery were verified by a logistics assistant at UNICEF, who double checked routes and distances to ensure the correct mileage was claimed. This significantly improved the accuracy of invoicing.

## Kenya

Kenya's successful textbook delivery scheme (Read, 2015: 166) provided decentralised capitation grants to primary schools to enable them to purchase textbooks direct from booksellers. Booksellers won contracts with schools individually, by offering discounts or free delivery. However, in some areas the cost of travel to the school may wipe out the bookseller's profit, and in some cases, they have promised free delivery but failed to provide it. Project monitoring by PricewaterhouseCoopers shows that the majority of schools received the correct orders in good time. Success factors were:

- Strong but simple management systems designed to create a clear audit trail for monitoring the system.
- Extensive training of school staff, inspectors, Teachers' Advisory Centres, schools, publishers, and booksellers in the required systems.
- The availability of basic system management handbooks for schools and the book trade.
- Rigorous external monitoring (via the firm PwC) on a random basis intended both to support and train staff in system monitoring.
- On-time release of decentralised funding.
- The incentives for efficient performance created by payments to booksellers only after correct delivery.
- The strength and national coverage of the Kenyan book trade.

## Lesotho

Lesotho ran a successful textbook distribution scheme from 1982 to 2005 (Rea, 2015: 164). Success factors were:

- It established strong management and monitoring systems, reviewed them regularly and amended them as required.
- It had well-trained staff with consistent management who remained in post for long enough to become thoroughly familiar with their work and their responsibilities.
- It consistently reviewed its own performance, identified problems, and proposed solutions to address the problems.
- Every three or four years it commissioned an external independent review to report on progress and efficiency and it took decisive action on the recommendations.
- It consulted regularly with teachers, the school managers (mostly churches), headteachers, and parents and took notice of their criticisms and suggestions.
- It maintained a group of field officers who reported regularly on the real conditions of schools.

## Rwanda

Rwanda recently launched a monitoring and tracking system which has helped organise teaching and learning materials (TLM) (Read, 2015: 169). The database contains details of all schools and grade level roll numbers, all approved textbooks, teachers' guides, and supplementary materials and allocated budgets for school-based TLM procurement. It monitors school ordering against their budget and provides a distribution schedule for publishers. Confirmed Delivery Notes have to be signed and stamped by every school as proof of successful delivery. The system tracks inventory in order to manage projections for the future and identify storage and usage problems. The first year achieved 99 per cent successful school ordering and 98 per cent successful delivery direct to schools at no cost to the schools.

## Sierra Leone

In Sierra Leone, a programme evaluation found that poor management hampered the textbook distribution programme (Sabarwal, Evans & Marshak, 2013). District Education Officers and head teachers did not have a clear idea of who was responsible for picking up textbooks, signing for them, and monitoring delivery. There was no paper trail for the actual disbursement of books. Only 20 per cent of cases had books delivered directly to schools, and up to 25 per cent of headmasters claimed they had to pay for textbook pickup from their own resources without reimbursement.

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<http://supplychainsforchildren.org/~media/files/scc/zimbabwe%20etf%20packing%20%20distribution.ashx>

## Key websites

- UNICEF – Supply Chains for Children: <http://supplychainsforchildren.org/>
- Transaid: <http://www.transaid.org/>
- John Snow, Inc – international health logistics:  
<http://www.jsi.com/JSIInternet/IntlHealth/index.cfm>

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