

Challenges in Implementation of Appropriate Technology Projects: The Case of the DISACARE Wheelchair Center in Zambia

By Kurt Kornbluth and Philip Osafo-Kwaako

“...the most exciting part about these new features is that they do not cost more and we can still deliver a wheelchair for \$41.17. Isn't it astounding that God would lead us to a new manufacturer with an innovative approach to our design needs?”-*From the Free Wheelchair Mission's Website, June, 2005*

The statement above summarizes the challenge faced by DISACARE Wheelchair Centre in Zambia. The center fabricates various models of wheelchairs; and at a retail price of about US\$280 they obtain only a slim margin above their net costs. DISACARE provides an interesting example of the implementation of an appropriate technology project which attempts to utilize locally-available resources to address technological problems.

From its modest establishment in 1991, DISACARE has emerged from a two-man team to an organization with 23 employees many of whom are disabled. They have gained expertise in wheelchair fitting and manufacturing, machining, training, accounting, carpentry, and tailoring. As a local Zambian Non-Governmental Organization (NGO) DISACARE has proven fiscally responsible, with excellent financial reporting to its donors. It offers employment for people with disabilities and advocacy and sports programs. DISCARE mobility aid devices have proven durable and well-suited for Zambian conditions. Donors have heralded DISACARE as a model development project, which could be replicated in other sectors and other regions, but it still faces challenges.

This study is meant as a starting point for a discussion of the value of DISACARE as a social investment scheme, to assess their net benefits, taking into account non-market objectives such as local skills training and capacity building, as well as poverty-reduction among the disabled community. We focus on key questions: was DISACARE a viable development project; was DISACARE a valuable investment from the perspective of donors; and to what extent have intended beneficiaries (the disabled in Zambia) gained from the DISACARE project.

BACKGROUND-Disability aid in Zambia

Following independence, most African states pursued state-led industrialization strategies, aimed at strengthening local industries and spurring economic growth. In most cases, such ‘infant industries’ were established under highly protectionist economic policies. In most cases, these ‘import substitution’ industries tended to be inefficient, resulting in large fiscal deficits and rising debt levels for several governments (Thirlwall, 2003). By the 1990s, most developing countries in Africa were in economic decline. Under various adjustment schemes proposed by international donors, a number of market liberalization programs were proposed. These market-based reforms were broadly aimed

at stimulating economic growth in these countries (Thirlwall 2003). At the end of the 1990s however, the anticipated economic growth in most countries had not been achieved and there was an overall increase in levels of poverty and inequality in most communities. For most Southern African states, there was an additional drain on government revenues due to increasing prevalence of HIV/AIDs, with donor policies shifting accordingly (Saasa 2002).

Now as a least-developed country (LDC) in southern Africa, Zambia remains highly dependent on the international donor community to support social investment schemes since formal effort to support particularly disadvantaged or vulnerable groups is provided mainly by informal family networks and NGOs. For most sub-Saharan African countries, official national disability policies are often non-existent or are yet to be implemented. In a survey of national disability policies in 83 countries (industrialized, middle-income and developing countries), the UN Social Commission for Social Development observed widespread gaps in support provided to persons with disabilities in developing. For example, in the case of Zambia, (Michailakis 1997) reports the lack of regulations to provide accessibility of public buildings to persons with disabilities, and poor national coordination and dialogue on disability issues.

BACKGROUND-DISACARE Wheel Chair Center

In 1991 Zambia was among the poorest countries in southern Africa. The many people disabled by polio had no wheelchairs or prospects for mobility devices. David Mukwasa, grandson of the then-Zambian president Kenneth Kaunda, and a medical student Felix Sulimba, both polio victims, envisioned DISACARE in the early 1990s. The two approached The Finish International Disabled Development Association (FIDIDA). Over the next decade FIDIDA's partner organization, Finish Association of People with Mobility Disabilities (FMD), which would play a large role in the shaping and supporting of DISACARE. They also approached Kenny Mubuyaeta, a polio victim trained in metal fabrication. Kenny left his work in the Copper Belt in northern Zambia and moved to the capital, Lusaka, to join DISACARE and take up the challenge of building local wheelchairs.

DISACARE started in a small rented garage earning income repairing shopping carts and wheelchairs. Kenny and David continued working and trying to get business and raise money, many months not receiving pay. In 1991 the Kenneth Kaunda's government gave DISACARE a large plot in Libala, on the outskirts of Lusaka. In 1995 money was raised from international NGOs for a workshop and small dorm-style living quarters. In 1996 the workshop in Libala was officially opened and DISACARE resides today. Since 1991 Kenny and David have convinced many local and international organizations to help DISACARE.

Products

DISACARE currently provides a number locally-built mobility-aid products including: The Kavuluvulu, which is the standard folding wheelchair outfitted especially for Africa, the tricycle wheelchair, which is specially designed for long distance journeys, the cerebral palsy (CP) wheelchair which is designed with additional features, such as cushions and tray tables for CP users, and the sports wheelchairs which is specially designed for users participating in out-door sporting activities such as basketball. In an

aim toward self-financing DISACARE has priced its products to include all costs, including labor, materials, overhead, and capitol depreciation.

Disability Advocacy

DISACARE currently operates as a Trust governed by a Board of Trustees with a mission, *“To provide Mobility, empowerment and self-sustenance for persons with disabilities”*. They are the only domestic fabricator of wheelchairs, also offering repair and customized fitting. DISACARE has been a major advocate for people with disabilities by providing appropriate mobility aids, as well as training and employment. Furthermore, DISACARE has increased the visibility of people with disabilities in the community: Both Kenny and David have polio but drive cars; DISACARE workers have broken the stereotype of disabled people of being unable to work or simply beggars; Twice a week wheelchair riders gather at DISACARE to play wheelchair basketball.

Wheelchair sales

DISACARE began repairing wheelchairs in 1991 and gradually started in production in 1993. The sales leveled off at 200 per year and their market has not grown since 2003, due to poor marketing, high overhead costs, and weak purchasing power in the domestic market. DISACARE must sell between 180-240 wheelchairs per year to pay salaries and more to be self-sustaining.

Table 1: DISACARE Wheelchair sales and repairs

Year	Wheelchairs produced	Wheelchairs Repaired
1991	-	15
1992	-	200
1993	5	120
1994	7	100
1995	8	60
1996	12	60
1997	20	80
1998	50	100
1999	70	60
2000	80	50
2001	115	40
2002	190	50
2003	197	40
2004	100 (Aug)	20
2005		
TOTAL	854	995

Source: DISACARE (Lusaka, Zambia)

The competition

Wheelchairs produced in Zambia face stiff competition from other wheelchairs imported from Asia. DISACARE faces high overhead costs and since it sources most of its products domestically, it may not be using the cheapest possible sources of raw material imports. The basic DISACARE Wheelchairs cost \$280, is locally repairable, and last from 2-5 years if maintained. Although this seems inexpensive when compared to a typical folding wheelchair costing from \$500-\$1000 in the US or Europe, many aid organization prefer to donate cheaper Chinese-made wheelchairs. Although these inexpensive imports often have poor ergonomics, have not proven suitable for the local

conditions, and have a short life (6 months-2 years), many donors have opted to buy them because at \$75-\$200 each they can provide or more clients for the same cost.

Providing Employment

Providing employment is important objective of DISACARE. With the expansion of its operations in the past decade, DISACARE has increased the size of its workforce to twenty-six, generating employment within the local economy. DISACARE implements affirmative action when hiring and as a result over half of the workforce has a physical disability.

Capacity Building of DISACARE

Donors and volunteers have built the capacity of DISACARE by supplying experts to train staff members in the areas of wheelchair design, accounting, fundraising and administration, and sports. As a result DISACARE staff is very capable in understanding the needs of people with disabilities as well as running the day-to-day operations.

Table 2: Capacity building of DISACARE

Year	Specialty	Comments
1991-1997	Prothetist	FMD volunteer
1993	Wheelchair designer	WWI Paid consultant
1997	Wheelchair Sports	FMD Paid consultant
1997-2001	Wheelchair designer	WWI paid consultant
1997-present	Wheelchair designer	WWI paid consultant
2001, 2004	Product designer	DEKA Volunteer
1999-2001	Administration/Fundraising	VSO Volunteer
2002	Administration/Fundraising	VSO Volunteer
2002	Accounting	VSO Volunteer

Source: DISACARE (Lusaka, Zambia)

Financing of DISACARE

Throughout its short history of operations, DISACARE has relied heavily on external donor support as a source of financing and capitalization, summarized in table 3.

Table 3: Sources of DISACARE Funding

Year	Donor	Monetary value	Description
1991	FIDIDA	\$ 80	Tools
1991	Meal-a-Day	\$3500	Tools, equip
1991	Dutch Embassy	\$3000	Equipment and materials
1992	Gov't of Zambia	\$200	3.5 acre plot
1992-1997	FMD	\$10,000 (est.)	Equip. materials, Machinery
1993	FMD	\$15,000	WWI training
1995	Beit Trust	\$25,000	Accommodation blocks
1997	FMD	\$1000	Basketball court
1999	Abillis	\$5000	Office equip, materials
1999	British Embassy	\$7000	Office equip, materials, building
2000	German Embassy	\$9,000	Lathe
2001	Irish Aid	\$11,000	Mill machine
2001	Danish Embassy	\$8000	Materials, equip
2001	Beit Trust	\$6000	Workshop extension
2001	FMD	\$4500	Vehicles
2002	US AID	\$5,000	Office equip, furniture,
1998-2002	FMD	\$60,000(est.)	Wheeling wheels project
2003	FMD	\$8000	Cap. building, shop upgrade
2003	Barclays Bank	\$ 400	Machine tools
2004	FMD	\$1000	Vehicles
TOTAL		\$182,680	

Source: DISACARE (Lusaka, Zambia)

Current DISACARE assets

Much of the donor investment in DISACARE, such as the buildings and the land near Lusaka where they are situated, is still owned by the DISACARE trust and has appreciated. The estimated current value of its assets is presented in Table 4 below.

Table 4: Assets of DISACARE Center (December, 2003)

Item	Value
Land	\$25,000
Buildings	\$80,000
Sports toilets	\$ 2,500
Basket ball court	\$ 2,000
Inventory	\$12,000
Containers	\$ 4,000
Machinery	\$30,000
Office equipment	\$10,000
Cash	\$ 7,000
Furniture	\$ 2,000
Vehicles	\$ 7,500
TOTAL	\$182,000

Source: DISACARE (Lusaka, Zambia)

SUMMARY

It is interesting to note that whereas many donor investment projects end up bankrupt after five or ten years, the current assets of DISACARE roughly equal to the total donor investment since inception. A brief summary of the benefits and costs are as follows:

Costs to Donor community

- Total cash investment of \$182,000
- In-kind services provided by volunteers

Benefits to Zambian disabled community from DISACARE

- Over 1750 disabled people provided with wheelchairs
- Currently providing employment for 26 Zambians
- Increased industrial capacity in Zambia
- Increased capacity in the East/Southern African region
- Raised awareness of people with disabilities in Zambia

The total number of wheelchairs repaired over DISACARE's history we have about 1750 people with disabilities have been provided for over the 14-year lifetime of DISACARE. If we just look at the cost to donors without a discount rate, that translates to \$182,000/1750 people or a little over \$100 per person.

REFERENCES

- Hill, M. (2004). Promoting and Sustaining Economic Reform in Zambia. Boston, Harvard University Press.
- Michailakis, D. (1997). Government Action on Disability Policy: A Global Survey. Stockholm, Liber Publishing House.
- Saasa, O. (2002). Aid and Poverty Reduction in Zambia: Mission Unaccomplished. U. N. A. Institute.
- Smillie, I. Mastering the Machine Revisited: Poverty, Aid and Technology, ITDG.
- Thirlwall, A. P. (2003). Growth and Development: With Special Reference to Developing Countries, London.
- World Bank, 2003, 'Zambia: The Challenge of Competitiveness and Diversification', Washington DC: World Bank Report No. 2588-ZA