

Linking Vocational Education to the Economy in the DRC's Copperbelt

APRIL 2018



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This study was made possible through a partnership with **Apple Inc.** in the Democratic Republic of the Congo, which includes raising safety awareness in mining communities and offering greater vocational education opportunities to at-risk youth in the region.



SECTION ONE

Introduction

Cobalt applications have existed for millennia. However, the metal's use in lithium ion batteries in the consumer electronics and electric vehicle industries, as well as aerospace applications, has meant that demand for the metal is rapidly growing. The Democratic Republic of the Congo (DRC) is now producing more than 60 percent of the globe's cobalt, all of it coming from the relatively compact Copperbelt of the southern Katanga region. While most cobalt from the DRC is produced through industrial, or large-scale mining (LSM), an estimated 90 percent of cobalt mining employment is in artisanal and small-scale mining (ASM).¹ According to the 2017 study conducted by the Center for Effective Global Action (CEGA) at UC Berkeley, "of the mining labor force living in the mining communities of the copper cobalt belt, 13% are below the age of 18," which is the minimum age at which people can be employed in mining, since the profession is considered a form of hazardous work by the International Labour Organization.



60%

OF THE
GLOBE'S
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THE DRC

The 15-to-17-year-old age group is particularly impacted by mining, both because they make up more than half of child laborers in the sector according to CEGA and because they are most likely to be heads of household, to work independently, to perform heavy mining tasks from which significant income is derived, and to depend on such income for their livelihood.² For these reasons, any approach to reducing child labor among this age group must seek to place such children in other forms of employment that can substitute income from mining and that are either non-hazardous or whose hazards can be properly mitigated.



15-17

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Given the identified key causes of child labor, ranging from poverty to lack of alternatives to social norms [CEGA], effective child labor mitigation should be based on a community-based approach, embraced by UNICEF.³ This includes the establishment of local multi-stakeholder child protection communities that are a key foundation for interventions.

The challenge in finding alternative employment is partly related to the political and economic strife of the 1990s in the DRC and the disruptive impact this had on industrial mining and the industry's suppliers and auxiliary services. As a result, while expertise and demand for goods and services outside the mines exist, the legacy of the collapse of industrial mining and auxiliary industries continues in the form of costly or unavailable inputs, insufficient resources for training and scarce start-up capital. In order to identify alternative employment

1. Faber, B. et al. (2017). Artisanal Mining, Livelihoods, and Child Labor in the Cobalt Supply Chain of the Democratic Republic of Congo. CEGA White Papers, 1: http://cega.berkeley.edu/assets/cega_research_projects/179/CEGA_Report_v2.pdf, 1
2. Faber, B. et al. (2017). Artisanal Mining, Livelihoods, and Child Labor in the Cobalt Supply Chain of the Democratic Republic of Congo. CEGA White Papers, 28, 39
3. https://www.unicef.org/infobycountry/drcongo_67998.html

options that can provide a suitable income, are or can be rendered adequately safe for 15-to-17-year-olds in accordance with the ILO standards, and are not excessively difficult to practice on a long-term basis due to the above factors, Pact conducted a market study to inform a vocational education program for miners of this age group in six communities in Kolwezi, the cobalt production hub of the region.

SECTION TWO

Methodology and Results

The study served two objectives:

- Identify a range of trades and professions that are non-hazardous, are likely to provide an alternative source of income to 15-to-17-year-old mine workers, and for which there are existing vocational education facilities and expertise.
- Identify specific vocational facilities, businesses and independent tradespeople and artisans working in the identified trades who have the capacity and willingness to supervise apprentices.

The underlying assumption of the market study was that if young artisanal miners have sufficient and sustainable sources of income from trades that are relevant and suitable, they are most likely to choose those and remain out of mining.



IF YOUNG ARTISANAL MINERS HAVE SUFFICIENT AND SUSTAINABLE SOURCES OF INCOME FROM TRADES THAT ARE RELEVANT AND SUITABLE, THEY ARE MOST LIKELY TO CHOOSE THOSE AND REMAIN OUT OF MINING

Since existing employment and local economic data relevant to the study were sparse, particularly regarding the independent trades most suitable for vocational training, Pact used a straightforward approach. The study first leveraged the knowledge about demand for goods and services among the largest businesses operating in Kolwezi, as well as government, civil society, and vocational education institutions in Phase 1. The Phase 1 informants were selected not only due to their knowledge of demand for goods and services by their organizations, but also because they spanned a cross-section of middle- and upper-income residents of Kolwezi and were therefore likely to be representative of segments of the population with disposable income, and therefore the bulk of household consumption. A Phase 2 survey then collected data from individual tradespeople. The Phase 2 survey's objectives were to validate and narrow down the trades most frequently cited in the Phase 1 survey.

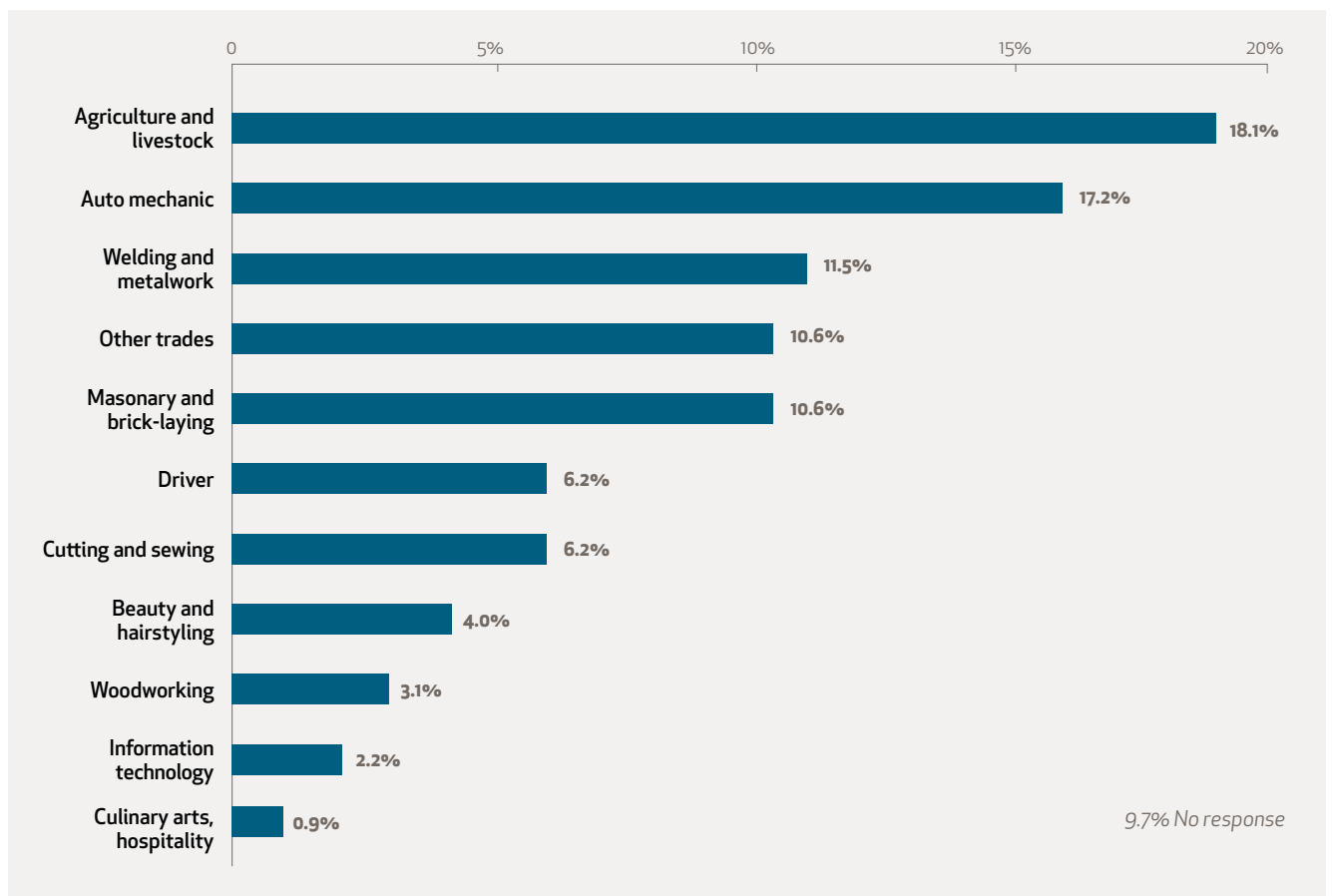
Phase 1 Survey

Data collected in the Phase 1 survey included trades considered to be in significant demand and suitable for 15-to-17-year-olds, as well as whether informants' organizations employed expatriate personnel and, if so, for which positions. The below graph shows the top ten most frequently cited promising trades among this set of informants. There were 227 respondents to the Phase 1 survey.

Phase 2 Survey

The Phase 2 survey sought out informants in the most frequently cited fields of the Phase 1 survey to determine whether they indeed enjoyed high levels of job satisfaction and high enough incomes to substitute for mining incomes. The results of this survey largely confirmed that the fields cited in Phase 1 were appropriate (see below tables). Importantly, 90 percent of Phase 2 informants said that no formal education was required to learn the trade. They also enjoyed incomes significantly above the DRC average and high levels of job satisfaction. While conducting the survey, survey-takers also interviewed an electronics repairman who had a comparable income to some of the other trades, even though this profession had not been cited in the Phase 1 survey. There were 253 informants for the Phase 2 survey, though only 161 were willing to report their incomes.

FIGURE 1: Most frequently cited promising trades by local businesses, government, civil society, and vocational education institutions



There was a range of rates of self-employment versus working as an employee among tradespeople surveyed, suggesting that a mix of employment options are available to suit adolescent trainees with varying preferences for practicing their trades.

Overall, due to the income and job satisfaction data found in the second survey, Phase 2 largely confirmed the assumptions of informants in Phase 1, and the team did not expand the survey into other fields with the exception of electronics repair, as data collectors observed apparently bustling businesses in this field. The on-site observations made as part of Phase 2 as well as follow-up research also eliminated two fields identified in Phase 1 from consideration due to safety and legal

82%

OF RESPONDENTS ARE SATISFIED WITH THEIR OCCUPATION

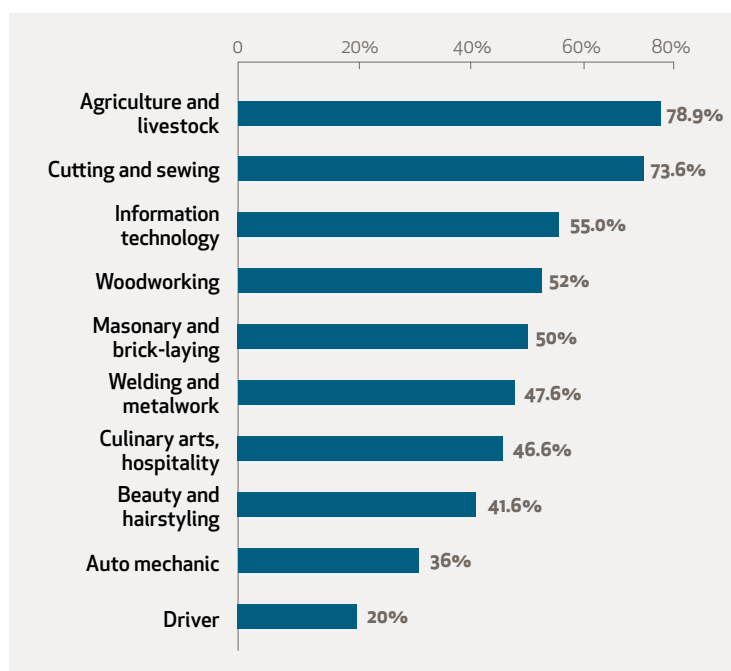
TABLE 1: Phase two survey: reported income

TRADE	Mean monthly after-tax income reported (US\$)
Agriculture and livestock	638
Culinary arts	528
Beauty and hairstyling	374
Driver/chauffeur	550
Sewing and dressmaking	330
Electronics repair	286
Information technology	308
Masonry and brick-laying	396
Automobile/motorcycle mechanic	748
Woodworking	858
Welding and metalwork	418

considerations. Commercial agriculture in the area was observed to involve extensive use of pesticides and other chemicals, hazards that could not be properly mitigated. In addition, the minimum driving age in the DRC is 18. Training to be a chauffeur therefore was not considered suitable.

Besides safety considerations (due to which other potential fields were also eliminated, including two from the Phase 1 survey; see table 3), Pact, in consultation with local vocational education institutions, other Phase 1 informants, as well as economics students from the University of Kolwezi, examined the medium-term perspective for the nine fields ultimately selected, informed by basic assumptions about Kolwezi's developing regional economy and growing demographics, as well as their relationship to the booming mining sector. Based on this analysis, Pact retained the remaining nine fields to

FIGURE 2: Rate of self-proprietorship among phase two surveyed tradespeople and professionals



give training beneficiaries as much choice as possible. The below table reflects the conclusions of the medium-term analysis, regarding the rationale and advantages as well as requirements and dependencies. Pact is addressing the latter through supervision of training content design by mentors, the provision of sufficient equipment, and end-of-program workshops to address certain practical skills such as permitting, marketing, customer service, and basic financial planning.

FIGURE 3: Additional learnings from the phase two survey



TABLE 2: Advantages and dependencies of selected fields

Trade	Rationale and advantages	Requirements, dependencies
Auto mechanic	<p>Large number of vehicles in Kolwezi</p> <p>Poor roads</p> <p>Positive long-term outlook due to growing market and low risk of automation</p> <p>Moderately good availability of replacement parts</p> <p>Stable work with returns to experience due to automobile innovation</p>	<p>Time needed to develop customer loyalty</p> <p>Requires capacities for analysis and methodological approach</p> <p>Requires excellent fine motor skills</p>
Welding and metalworking	<p>Role in mining auxiliary services, local procurement initiatives, and other formal businesses that are once again growing due to renewed dynamism in the mining sector</p> <p>Broad range of applications related to construction, cottage industry, and early-stage industrialization</p>	<p>Requires proper safety equipment</p>
Masonry and brick-laying	<p>Large and growing demand for housing in Kolwezi</p> <p>Straightforward skills acquisition</p> <p>High degree of income stability</p> <p>Low start-up capital requirement</p>	<p>The trade can be disrupted during certain periods of exceptionally heavy rain</p>
Cutting, sewing and dressmaking	<p>Similar to food and housing, the positive demographic trend in Kolwezi is particularly favorable for this trade</p> <p>Increasingly varied tastes in clothing</p> <p>Lucrative</p> <p>Little need for space; easy to set up a business in different corners of the city, including neighborhoods with few other services or infrastructure</p> <p>Straightforward skills acquisition</p>	<p>Time needed to develop customer loyalty</p> <p>Requires patience and attention to detail</p>
Beauty and hairstyling	<p>Consumer tastes changing with increased urbanization present favorable market outlook</p> <p>Comprises many services that a large proportion of Kolwezi residents consume on a regular basis</p> <p>Little need for space; easy to set up a business in different corners of the city, including neighborhoods with few other services or infrastructure</p>	<p>Location very important</p> <p>Marketing very important</p> <p>Requires being sociable and listening closely to clients</p>
Woodworking	<p>Linked to growing market for home construction</p> <p>Not subject to seasonal fluctuations</p> <p>Range of product niches</p> <p>The main input, wood, is readily available</p>	<p>Requires remaining up-to-date on trends</p> <p>Somewhat more difficult compared to other fields to obtain equipment (to be addressed through project kits)</p>
Information technology	<p>In demand by SMEs and NGOs with growing complexity of local economy</p> <p>Positive long-term outlook</p>	<p>Requires a relatively high aptitude compared to other trades and some basic skills typically acquired through formal education</p>
Culinary arts and hospitality	<p>Hotel and restaurant development is increasing in Kolwezi</p> <p>Employment available in both formal and informal sectors</p>	<p>Marketing is important to attract customers and guests</p> <p>Particular importance of customer service</p> <p>Particular importance of location</p>
Electronics Repair	<p>Kolwezi residents are increasingly owners of consumer electronics and appliances</p> <p>Extending the life of such products is of great interest to Kolwezi consumers, necessitating skilled maintenance and repair</p>	<p>Requires access to an array of consumer electronics and appliances on which to practice and learn the trade</p>

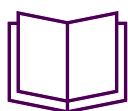
SECTION THREE

Challenges

Vocational education system challenges

Three principal problems were identified by the market study in the existing vocational education system, listed below, along with ways in which the implementation of the apprenticeships in this project is addressing them:

- **Shortages and poor condition of equipment.** The project is providing kits for use during and after the apprenticeships.
- **Current vocational education is observed and reported to be overly theoretical and insufficiently practical,** with few standards to ensure the performance of instructors and mentors, and little attention given to marketing. The project is providing training for mentors on establishing an apprenticeship plan and strategy, success indicators, and child protection, with such components informed by the requirements and challenges linked to each trade that were identified in this market study.
- **There is currently no tracking of outcomes of vocational education programs,** preventing practitioners from understanding impacts or making well-informed adjustments. This project's internal tracking and the independent, two-phase evaluation in November 2017 and May 2018 will provide robust evidence regarding impact, best practices, and shortcomings to better inform future vocational education and alternative livelihoods interventions.



THE PROJECT IS PROVIDING KITS, TRAINING AND TRACKING TO OVERCOME CHALLENGES IN THE VOCATIONAL EDUCATION SYSTEM

Local political economy challenges

Three principal challenges to the practice of many trades in Kolwezi, including the ones selected for implementation, were identified by the market study related to the local political economy. These are listed below, along with ways in which the implementation of the apprenticeships in this project is addressing them:

- **The attraction of fast cash in the mines may deter prospective apprentices from undertaking a new endeavor,** especially one requiring the patience and commitment necessary to acquire new skills. The project has budgeted funds for stipends to help apprentices bridge the lost income from mining pending being able to independently practice their chosen trade. In addition, apprentices have already received awareness-raising on the risks of mining, particularly related to health and lost educational opportunities, and confirmed their interest in participating.
- **Frequent illegal taxation by law enforcement and regulatory authorities of those working in the informal sector.** Pact is mandating that apprenticeship mentors guide apprentices in obtaining all necessary permits and authorizations to conduct their chosen trade legally in order to avoid being harassed. In addition, apprentices will receive certifications of completion.
- **Electricity is unreliable and outages are frequent.** For trades that are particularly dependent on electricity, Pact is considering subsidizing a generator and some fuel in the kit package, provided that there is budget and that their provision is likely to lead to a sustainably higher cash flow to permit the beneficiary to purchase his or her own fuel in the future.

Complementary components of the intervention

The apprenticeships intervention was designed from the beginning to include a workshop for apprentices following their completion of the program focused on life and financial skills to ensure their ability to effectively plan and manage their incomes. Consultation with stakeholders through the market study identified some additional, more specific content elements that will be integrated in some form, into either the workshop or the apprenticeships themselves. These include:

- Maintaining links with other apprentices and mentors within the framework of sustained communities of practice
- Language support in French and Swahili, particularly with regard to customer service
- Marketing, commercialization, sales, and procurement
- Management
- Professionalism, craft, and cultivating a passion for the trade



Survey administrators collecting data from a welder at Tilwezembe project site

SECTION FOUR

Occupational Health and Safety and Child Protection

Throughout this project, safety has been the highest priority. The project is guided both by international labor conventions and by DRC's policy framework for adolescent vocational education. Foremost among these are the International Labour Organization's Minimum Age Convention (C138) and Worst Forms of Child Labour Convention (C182), both of which draw a clear distinction between vocational training and child labor. C182's Article 7 specifically directs states parties to ensure access to vocational education for children removed from the worst forms of child labor.⁶ The project also corresponds to DRC's 2016-2025 national sectoral strategy drafted by the ministries of education and social and humanitarian affairs, which places an emphasis on giving youth more educational choices, partnering with the private sector and pioneering vocational education options outside the formal education system.⁷ Regarding safety considerations and DRC vocational education existing practice, all of the selected trades in this project that arguably entail the highest level of risk, such



**THE PROJECT'S
SAFETY
FRAMEWORK
WAS GUIDED
BY ILO
CONVENTIONS
AND THE DRC'S
POLICIES**

6. http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C182

7. <https://www.globalpartnership.org/fr/download/file/fid/52992>

TABLE 3: Trades not selected due to occupational hazards that could not be properly mitigated

TRADE	Hazard(s)
Domestic work	Elevated risk of abuse due to private circumstances of work
Brick-making	Excessive physical strength required to operate the brick mould Need to work during the night
Carpentry for homebuilding	Involves work at unsafe heights
Commercial or passenger driver	Poor road safety conditions Vulnerability to robbery, extortion
Construction	Involves work at unsafe heights Elevated risk of falling objects
Large-scale mining	Use of explosives Use of heavy machinery
Large-scale agriculture	Use of pesticides and other chemicals

as welding, auto body work and electronics, have previously been included in local vocational training programs of public vocational education institutions in Kolwezi. The overriding framework Pact deferred to in its safety policies and procedures for the program is ILO's guidance regarding the application of C182 in Children in Hazardous Work (2011). In particular, the document states: "A crucial fact to remember is that almost all work carries some risk. However, work in the presence of hazards is not necessarily hazardous work. A child over minimum age [15 and older] can work (1) if the hazard can be actually removed, (2) if the child can be separated sufficiently from the hazard so as not to be exposed, or (3) if the risk associated with that hazard can be minimized. The ILO speaks of this as 'identifying hazards and reducing risks'"(p. 14).⁸ With this in mind, Pact eliminated several potential trades from consideration due to the presence of intrinsic hazards that could not be properly

mitigated; is providing safety equipment to trainees; has set up regular safety inspections by vocational education institutions and community-based multi-stakeholder committees; trained the vocational education mentors in child protection; and incorporated safety training as the first module in all training programs.

SECTION FIVE

Conclusion

Moving toward more data-driven and sustainable vocational education

The need to develop alternative income-generating activities to enable child miners to withdraw from the sector has been established through research, including the study by CEGA and Pact's Breaking the Chain report, as well as feedback from child miners themselves. The lack of both meaningful data about the viability of different trades and an approach that meets prospective trainees' needs in terms of practical support and rapid preparation for the work force have been significant obstacles to placing adolescent miners in such programming. This market study has provided sufficient data to inform a vocational education program for adolescent youth who depend on mining income to meet their basic needs. More needs to be done, however, to both develop more robust data, including based on the outcomes of the current program, and to leverage such data not only to improve the program but to integrate it into sustainable, locally driven and managed youth training programs.

8. http://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_155428.pdf

The market study's data can be built upon in several ways. It can first be updated and expanded to enlarge the number of fields covered by the second survey to ensure that no opportunity is missed in placing youth in vocational training as the local economy continues to respond dynamically to the booming cobalt market. In addition, as other NGOs work with the DRC government to implement other vocational education programming using existing approaches, outcome data of different programs can be compared in order to share best practices, generate hybrid models, and develop more precise criteria for different training tracks based on beneficiary needs.

It will also be important to harness the broader potential dividends for the Copperbelt region's economy of vocational training. Economic conditions are, of course, one of the root causes of child labor in mining. Improving them, particularly in conjunction with promoting policies and practices that enable people in mining communities to benefit from the buoyant international demand for cobalt, is important in its own right. Two related approaches are necessary for accomplishing this. The first is by more quantitatively integrating trades' potential to be scaled up within the DRC and traded internationally. By generating data on this, future market studies can inform vocational training programs that truly leverage their potential to diversify the regional economy, make it more resilient, and build human and productive capital that will outlast the mines. The other approach is about building public financial management and technical capacity within the public and other local vocational education institutions to ensure they are equipped to manage and properly use increased public revenue from the mining sector for vocational training and related impact tracking. In this sense, short-term external assistance should enable the long-term autonomous sustainability of local institutions in this space.

This capacity-building process requires coordination with the DRC government as well as local and international NGOs and local communities. Remaining aligned on the DRC's national strategies, both regarding the withdrawal of children from mining as well as education and vocational training in particular, is essential. International NGOs can deliver initial continued and scaled-up implementation of the vocational education program while building the capacity of the DRC government and local institutions to gradually take the baton. In addition, continuing to build the capacity of community multi-stakeholder structures is necessary to ensure that larger institutions are held accountable by the communities they serve, including through accurate identification of and equitable service to beneficiaries in need. External assistance from both corporate and bilateral donors is required for several years to set these actions in motion and build a foundation for sustainability. Nevertheless, a credible vision exists to make the program technically and financially independent.



THE MARKET STUDY CAN BE BUILT UPON TO BETTER CAPITALIZE ON THE GROWING LOCAL MARKET THROUGH ADDITIONAL VOCATIONAL TRAINING



COORDINATION AND ASSISTANCE ARE NECESSARY TO BUILD THE CAPACITY OF VOCATIONAL EDUCATION INSTITUTIONS



1828 L Street, NW, Suite 300
Washington, DC 20036 USA
pactworld.org