

## SME training on agro-processing equipment fabrication from scrap metal

Charles K.D. Adjasi, Stellenbosch University and University of Groningen

### Summary

The industrial base of African countries is largely weak and fraught with a large number of micro and small enterprises with low productivity and weak growth prospects. This brief discusses the benefit cost ratio of training and provision of credit to one micro or small enterprise in scrap and metal fabricators as an intervention to increase the capacity and productivity base as a way of further boosting their long term growth and survival prospects. The estimates show that the intervention yields a benefit cost ratio (BCR) of 2.04 over a 2 year period using Ghana as a case. This is comprised of a cost estimate of USD 841 as cost of competency based certificate training in electrical/automotive engineering, a USD 50.5 sensitization cost and the opportunity cost to the participants (USD 641.89). It also has a USD 400 credit, with an operation cost of USD 140, a financing cost of USD 16 and default cost of USD 2.8. The benefits from this intervention amount to USD 2612 arising mainly from a 10% increase in sales and returns in credit (3%). There is the potential to scale-up this intervention by increasing the coverage of training and credit access. The potential for scaling across Africa is also possible albeit with some variation in terms of BCR-Kenya (BCR of 2.11) and Malawi (BCR of 1.48). Overall the benefits are substantially higher and the intervention costs are spread thin when one estimates with a 5 year horizon.

### The problem

Most African countries have low levels of industrial activity. A large proportion of firm tissue in these countries is made up of MSMEs (micro, small and medium scale enterprises) with very weak industrial and technical capacity base (African Development Bank 2019). This comes with the often cited case of “large missing middle” in industrial activity,

where a chunk of the firm tissue is made up of small and micro enterprises with some few large firms and almost an absence of medium sized firms. The implication is that growth prospects for micro or small sized firms is rather low or almost non-existent. As a result the quantum as well as value add of economic output from manufacturing base is low. A number of challenges have been raised as being the key cause of such low level of industrial base. Two critical and oft cited challenges associated with the low productivity of SMEs are that of technical/human capacity/capability and credit access (World Bank Enterprise Surveys). Indeed the hub of entrepreneurship is also the MSME sector which comprises of both formal and informal enterprises with a substantial proportion of manufacturing firms in this sector<sup>65</sup>. This manufacturing sub sector consists of enterprises in scrap and metal fabrication and manufacturing of cooking utensils, bolts and nuts, automobile spare parts and small processing equipment like millers. These small and micro enterprises can with adequate training and access to credit manufacture these small agro processing equipment. The low manufacturing base in Africa can therefore be increased via increasing the technical skill and easing the access to finance of micro and small enterprise industries in metal and scrap fabrication. Training and access to credit will help boost their productivity and small business in scrap and metal fabricators hubs on design and manufacturing of small processing equipment like millers, threshers, ploughs, canning, steel and metal processing, light industrial semiconductors for agro manufacturing.

### The analysed solution

The intervention consists of training of small business in scrap and metal fabricators hubs on design and manufacture of small agro processing equipment millers, threshers, ploughs, canning, steel and metal processing,

---

<sup>65</sup> See studies by Hope (2014) World Bank (2016)

and light industrial semiconductors for agro manufacturing. The training will be offered by the existing accredited technical and vocational educational institutions in the respective countries. These are Council for Technical and Vocational Education and Training (COTVET) approved institutions in Ghana, the Technical and Vocational Education and Training Authority (TVETA) colleges in Kenya and Technical, Entrepreneurial and Vocational Education and Training (TEVET) institutes in Malawi<sup>66</sup>. This will be coupled with an access to credit programme post training. The low capacity and productivity state of SME activity in Africa is likely to remain or worsen in the absence of technical capacity building and credit based interventions like the proposed one. SME activity in African countries is large but mainly tiny and fragmented. For this reason the intervention is applicable to all African countries. However for the purpose of this brief the test is done on the cost and benefit of training one micro or small enterprise manufacturer in Ghana, Kenya and Malawi. These countries represent the main income groups (low income and lower middle income groups) and also help to gauge the sensitivity of estimates to the various country contexts.

### The costs and benefits

The training intervention is estimated to cost USD 841 as fees for competency based training via Technical Vocational Education Training (TVET), a USD 50.5 sensitization cost, USD 641.89<sup>67</sup> as opportunity cost of participants time and USD 400 in credit to trained SME participants. Additional costs include the operational cost of credit (USD 140), the financing cost of credit and the default cost of USD 2.8. There is also an added cost of formalizing informal enterprises after training. The cost calculations as indicated are based on the costs of intervention. The scrap

industry already exists in these countries hence the cost of collection and processing is not added as an intervention cost. The intervention will yield a benefit of USD 2612 additional sales made up of a 10% increase in sales (USD 2,600) and a 3% return on credit (USD 12).

TABLE 4 COSTS

Costs	Value (USD\$)
Total training cost (based on TVET)	841
Sensitization cost	50.5
Cost of formalizing business	26
Opportunity cost of participants' time	641.89
Credit microloan	400
Operational cost of credit	140
Financing cost of credit	16
Default	2.8

TABLE 5 BENEFITS

Benefits	Value (USD\$)
Increase in sales	2600
Return on credit	12

Sales estimates are based on an estimate of annual turnover of MSMEs from respective publications on SME activity (International Trade Centre, 2016; Kenya National Bureau of Statistics, 2017). The benefits of the project are that the metal and fabrication industry which consists of micro and small businesses will grow as a result of skill enhancement and credit access, equally the agricultural sector which consists mostly of smallholder farmers will benefit from the availability of small agricultural equipment to enhance processing and value addition. In addition the MSME sector is a substantial employer of low skilled people and is where entrepreneurship activities thrive. Their growth will therefore also increase the employment level across the economy. The benefit estimates exclude the potential employment effect that could arise from increased sales and growth. They also

<sup>66</sup> For instance Tema Technical Institute of Ghana established in 1968, Nairobi Technical Training Institute of Kenya established in 1964 and Kaiboi Technical Training Institute of Malawi established in 1962

<sup>67</sup> This is based on a foregone income of participants (USD 641.89) to be absent from their business for a 5 days training programme. The income is calculated as

the loss of manufacturing sector income = GNI\*manufacturing value add-contribution to GDP (9%)\*labour force rate (66.9%). This is rather high given that manufacturing income of USD 128 is not on a daily basis. Nonetheless it is taken to show a fairly conservative estimate of opportunity cost.

exclude enhanced environmental benefits from a cleaner and environmentally friendly processing and production that will be acquired under the training. The estimates do not include the production and or operational cost of new equipment as a result of the skills acquired.

The estimated BCR for a period of 2 years for Ghana is 2.04. On the short term end of a 1 year period the BCR is lower at 1.28. Indeed a 5 year horizon has a much higher BCR of 3.16. To have an idea of the possibility sensitivity of these BCR estimates to country contexts, results for Kenya and Malawi are also provide below. From a 2 year horizon, Malawi has the lowest BCR of 1.48 and Kenya the highest at 2.11. The BCR across countries is higher for a 5 year horizon. It does show some sensitivity to BCR estimates across countries. The latter section of the table shows BCR estimates with an assumption of a one time loss of income of USD 128.

TABLE 6 BENEFIT COST RATIOS

	Ghana	Kenya	Malawi
BCR (5 Years)	3.16	3.20	2.18
BCR (1 Year)	1.28	1.35	0.96
BCR (2 Years)	2.04	2.11	1.48
Lower opportunity cost-one-time loss			
BCR (5 Years)	3.53	3.38	2.27
BCR (1 Year)	1.68	1.55	1.07
BCR (2 Years)	2.50	2.34	1.60

## Discussion

There is potential for scaling up this intervention across many African countries. It is likely to increase the value add potential of SMEs and lead to a gradual but high impact increase in the productivity and growth of SMEs in Africa. This has a high potential to strengthen the industrial base of African countries. The intervention can be replicated in most African countries, given the importance and density of SME activity on most African countries. A potential risk in scaling up across Africa may lie in the cost of TVET based training in countries where TVETs are not well established or well equipped. In such instances the cost of training may escalate or training may be substandard. The

issue of smuggling of scrap metal across borders as well as vandalizing and theft of public infrastructure could be a potential challenge and appropriate regulation is needed. Regulation in the case of smuggling should also have a regional dimension where there is uniformity and information exchange across regional borders to ensure smuggling is adequately and uniformly curbed across borders. Regulation also has to be carefully structured so that it promotes the industry to develop and not become counterproductive. As a matter of fact Kenya and Ghana realised that a previous outright ban on scrap and metal dealers caused more harm in terms of lost economic and social benefits from the downstream production chain and thus rescinded the ban. Although it is estimated that female representation in the informal economy (which hosts a large segment of this sector) is high not much exists in terms of specific percentage of women in the scarp and metal fabrication industry. Indeed in the scale up of the intervention, there should be a target at encouraging women and in particular young females.

## References

- African Development Bank (2019) African Economic Outlook, African Development Bank Group, Abidjan, Cote d'Ivoire
- Hope, K. (2014) 'Informal economic activity in Kenya: Benefits and drawbacks', African Geographical Review 33(1): 67–80.
- International Trade Centre (2016). SME Competitiveness in Ghana: Alliances for Action. ITC, Geneva.
- Kenya National Bureau of Statistics (2017) Micro Small and Medium Enterprise Establishments Basic Report 2016, Nairobi Kenya
- Kinyanjui, M. (2010) Social relations and associations in the informal sector in Kenya. Geneva: UNRISD
- Kinyanjui, M. (2014) Women and the Informal Economy in Urban Africa: From the Margins to

the Centre. Zed Books Ltd, 7 Cynthia Street,  
London N1 9JF

World Bank (2016) 'Informal enterprises in  
Kenya'. Nairobi: World Bank.

World Bank (2018) World Development  
Indicators, World Bank Group, Washington DC

World Bank (2018) World Enterprise Survey,  
World Bank Group, Washington DC