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Developing a Multidimensional Youth Employability Index for South Africa

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Developing a Multidimensional Youth Employability Index for South Africa

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Sub-theme: Skills and competencies for transformative infrastructure and sustainable livelihood

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Abstract

Youth employability is a key pillar in socio-economic inclusion and employment strategies. Despite the attention it receives in policy circles, employability remains ill-defined and therefore hard to operationalise. In relation to the Sustainable Development Goals concerned with employment, work, and youth, for instance, there is no equivalent of the multidimensional poverty index to measure and map youth employability. Especially the most vulnerable youth, with low outcomes in education, health, social networks and various aspects of their living conditions, would benefit from a measurable and multidimensional approach to employability that can grasp the complex nature of the challenges they face in accessing and retaining employment. The better the constitution and contribution of employability are understood, the more targeted policy responses can be designed and im plemented to help support sustainable youth livelihoods.

We address this gap and develop a multidimensional youth employability index following the Alkire and Foster method to measure and map individual, home and neighbourhood deprivations that lead to a person being 'employability deprived' or having 'low employability'. Employability is understood as the ability to gain, sustain, and move on in employment, and the degree to which this depends on and shapes circumstances in young people's lives.

We operationalise the index with South Africa as a case study in this paper and use national survey data from South African Census 2011 data compiled by Statistics South Africa. The sample for analysis consists of nearly 800 000 youths from 15 to 24 years old, a weighed representation of 9,5 million youth in South Africa.

The results expose the ambiguous role of employment in employability. We find that employability differs among youth who are in formal or informal work, have become discouraged, or are unemployed but looking for a job. Youth in formal employment are less often deprived in employability. However, large proportions of employed youth are still deprived in employability. This raises questions about the ability of employment to break cycles of deprivation and the persistence of precarious circumstances in households and neighbourhoods. Our results further show that various forms of networks make a stronger contribution to employability than individual attributes such as education. More broadly, the results demonstrate the usefulness of an expanded, multidimensional view of youth employability to unpack hardships that would otherwise remain masked when gauging youth's socio-economic inclusion in the labour market using only "employment" as an indicator.

We argue that the index can help in creating more sustainable youth employment programmes by indicating which supportive measures could be included to help youth address multiple deprivations in their lived realities to avoid negating achievements made in employment creation. Building transformative employment programmes requires the creation of opportunities in work that capacitate youth to improve circumstances in other domains of their lives that contribute to their employability.

1. Employability

In contemporary literature, employability is predominantly linked to personal attributes like skills and knowledge and tends to be used to evaluate individuals and organisations at the centre of the labour market, including tertiary-educated graduates, formal sector employees, as well as companies and their interests in human resources [19]. The South African context is characterised by low levels of education among young people and employment scarcity. Vulnerability within the labour market is closely connected to people's poor socio-economic living environments [9]. A focus on those who are socio-economically vulnerable, while also considering the person's wider living environment in addition to personal attributes is therefore more useful for our purposes. We draw on McQuaid and Lindsay [18] who understand employability as the dynamic interaction between three components: individual attributes, personal circumstances, and contextual factors that make one more likely to progress towards, gain, sustain, and move on in employment.

2. Methodology

The Alkire and Foster (AF) approach is a multidimensional extension of the widely-used Foster-Greer-Thorbecke approach from 1984 [20]. We refer to Alkire, Foster [17] for a full methodological outline and describe this methodology in light of our application.

The AF framework requires the explicit selection of dimensions, indicators, weights, and cut-offs, as detailed in Box 1. The dimensions mirror the attention afforded in discourses on youth development and employability to education, social capital, economic opportunities, and commodities one needs to connect to the labour market [3, 24].

The selection of indicators is grounded in extensive work on youth outcomes and transitions in South Africa's labour market, as well as how they are impacted by individual, household and neighbourhood level factors [11, 25-28]. A wide range of potential employability indicators suggest that plausible alternative choices may exist [29]. The relevance of the selected indicators is therefore tested and discussed further in the appendix.

Standard AF practice is to assign equal weighting across and within dimensions [20]. The index distributes equal weights across the five dimensions (1/5 each), and to indicators within each dimension. The interpretation of the results is therefore straightforward and reflects that deprivations in the lives of young people are equally important.

Another set of user decisions is the overall threshold to determine whether a person is considered deprived, and the specific deprivation cut-offs within each indicator. The standard cut-off of 1/3, or 33.3%, of dimensions common in the literature is applied. This means that people are considered employability deprived, or to have low employability, if they are deprived in a third or more of the weighted indicators. Each indicator has a unique deprivation cut-off as detailed in Box 1.

The AF methodology provides a range of robustness checks to minimise the essentially normative and somewhat arbitrary nature of the above decisions [17]. These checks are detailed in the appendix. In addition to the empirical basis of the decisions based on the literature, the checks support the relevance of the chosen indicators and show that the index is robust to changes in weights and cut-offs.

Box 1: Multidimensional Youth Employability Index: dimensions, indicators, and cut-offs

DIMENSION 1: ECONOMIC OPPORTUNITIES *Captures the presence of an active and realised connection to the labour market via employed people in the immediate proximity of the young individual.*
Indicator 1.1 Household employment *captures the presence of an employed person living under the same roof as the young individual who represents an active and realised connection to the labour market through which information about the world of work including concrete job opportunities would enter the immediate living vicinity of the young individual.* ***Cut off:*** *Individual has no household members who are employed*
Indicator 1.2 Youth employment in the municipality *captures the active and realised connection via peers in the neighbourhood, through whom information about the world of work including concrete job opportunities would enter the lifeworld of the young individual.* ***Cut-off:*** *Individual lives in a municipality where less than 16% (municipal mean across country) of youth (15-24) are employed*
DIMENSION 2: EDUCATION AND LEARNING *capture the developmental trajectory of a young person in learning to acquire, process, and share information and knowledge.*
Indicator 2.1 Educational attainment *captures the farthest point of the educational trajectory of the young individual in a schooling institution* *Cut-off: Individual is aged 15-16 and has completed less than primary school, individual is aged 17-20 and has completed less than grade 9, or individual is aged 21-24 and has completed less than matric or matric equivalent*
Indicator 2.2 Literacy *captures the ability to identify, understand, interpret, create, communicate, and compute, using printed and written materials associated with varying contexts* *Cut-off: Individual has difficulty in at least one of the following things: writing her/his name; reading; filling in a form; writing a letter in any language; calculating/working out how much change should be received when buying something; reading road signs and has no tertiary education*
DIMENSION 3: HEALTH AND WELLBEING *captures the individual's physical and emotional wellbeing that allows for unimpeded engagement with the labour market*
Indicator 3.1 Physical health *captures the individual's physical basic functioning* *Cut-off: Individual has difficulty in at least one: seeing, hearing, communicating, walking, remembering or concentrating, self-care*
Indicator 3.2 Shock event *captures an event that can be expected to negatively affect the individual's mental wellbeing within the household* *Cut-off: Individual lives in a household where at least one household member passed away in the past 12 months*
Indicator 3.3 Youth discouragement in the municipality *captures the negative outlook of peers towards the labour market in the individual's municipality* *Cut-off: Individual is living in a municipality where more than 6.9% (= municipal mean across the country) of the unemployed youth have given up looking for work because no jobs available in the area, lack of money to pay for transport to look for work, unable to find work requiring her/his skills, lost hope of finding any kind of work, no transport available*

DIMENSION 4: SOCIAL CAPITAL *captures the bonding, linking and bridging capability of social networks between the individual and the labour market*
Indicator 4.1 Parental bereavement *captures the loss of networks, information, and relations a parent would be able to provide to the youth as a result of that parent's death.* *Cut-off: At least one of the individual's biological parents is no longer alive.*
Indicator 4.2 Educational attainment in the household *captures the bonds, linkages and opportunities a young individual would be part of and benefit from through the networks offered by household members with higher education levels* *Cut-off: Individual lives in a household where the average educational attainment of adults is less than matric or matric equivalent*
Indicator 4.3 Youth educational attainment in municipality *captures the bonds, linkages and opportunities a young individual would be part of and benefit from through the networks offered by higher educated peers* *Cut-off: Individual lives in a municipality where more than 34.9% (=municipal mean across the country) of the youth is deprived in educational attainment*
DIMENSION 5: CONNECTIVITY COMMODITIES *capture material resources in the individual's household that enable engagement with the labour market*
Indicator 5.1 Electricity in the household *captures the individual's opportunity to use electrical appliances that enable engagement with the labour market (e.g. job search, study, training, entrepreneurial activities from home)* *Cut-off: Individual lives in a household that uses mainly paraffin/candles/nothing/other for lighting*
Indicator 5.2 Internet *captures the presence of an internet connection in the household which the individual can use to engage with the labour market (e.g. Job search, study, training, entrepreneurial activities from home)* *Cut-off: Individual lives in a household that has no access to internet*
Indicator 5.3 Mobile phone *captures the presence of a mobile phone in the household which can be used as a point of incoming and outgoing contact between the individual and the labour market* *Cut-off: Individual lives in a household without a mobile phone*
Indicator 5.4 Car *captures the presence of a car in the household which enables engagement with the labour market* *Cut-off: Individual lives in a household without a car*
Indicator 5.5 Residence type *captures whether an individual lives in an informal housing type which usually is less connected to employment nodes than formal residences* *Cut-off: Individual lives in an informal type of residence*
Overall cut-off = 1/3 of the indicators or more. *If an individual's circumstances are such that she/he scores below the cut-off point in a third or more of the indicators, then we consider her/him employability deprived or low employable.*

3. Data

The analysis utilises the cross-sectional survey data from the Census 2011 10% sample, compiled by Statistics South Africa [30]. The data is accessible via https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/485. The Census reports on various relevant variables, such as education, employment, health, and living environment. Household and individual identifiers can be matched, and municipal characteristics can be computed, allowing for the individual to be further contextualised in the home and neighbourhood environment. Data from individual and household records are matched, and non-responses, missing values, and data of youth in transient, tourist hotels and institutions are removed. The final sample for analysis consists of 798 166 youths from 15 to 24 years old, a weighed representation of 9 517 064 youth in South Africa.

4. Deriving a family of three deprivation measures from the AF approach

The process of identification and aggregation generates a set of three employability deprivation measures, as summarised in Table 1.

The headcount ratio (H) is the proportion of youth that are employability deprived. According to the construction of the index, a young person is 'employability deprived' or considered to have 'low employability' when they are deprived in at least one third of the indicators detailed in Box 1. In practice, the implication is that an employability deprived young person faces multiple, simultaneous deprivations that are likely to hinder their ability to gain, sustain, and move on in employment.

The headcount ratio for the weighted census subsample indicates that of 9.4 million youth between 15-24 in 2011, 47.3.% or 4.45 million were employability deprived. The intensity of deprivation (A) is calculated as the average proportion of indicators in which youth are deprived. An intensity of 47.13% shows that youth with low employability experience deprivations in roughly half of all the indicators. The Multidimensional Employability Index (MEI) score, also referred to as the adjusted headcount ratio (M0), is calculated as the product of the headcount ratio (H) and the intensity of deprivation (A): M0 = H x A. The value of the MEI ranges from zero to one, with 1 indicating that all youth are deprived in all indicators. The national score is 0.22.

Table 1 decomposes these measures by various population groups. Black African youth are the most vulnerable to low employability with the highest scores of all three measures, (H), (A) and (M0). Interestingly, compared to large differences in the headcount (H) where over half of Black Africans are employability deprived compared to 4% of White youth, the intensity (A) varies little across population groups. Young men and women experience deprivation in similar proportions and intensities. Youth living in non-urban areas are proportionally more often deprived (H), along with slightly higher intensities (A) compared to urban youth.

Table 1: Employability measures by population group, gender, and geography

	H (Incidence)	A (Intensity)	M0 (Index Score)
All youth	47.34%	47.13%	0.22
Black African	53.34%	47.39%	0.25
Coloured	22.73%	42.56%	0.10
Indian or Asian	7.45%	41.62%	0.03
White	4.01%	39.85%	0.02
Other	31.91%	43.67%	0.14
Male	48.72%	47.43%	0.23
Female	45.98%	46.83%	0.22
Urban	28.13%	43.69%	0.12
Not in urban area	74.61%	48.98%	0.37

Source: own calculations based on weighted data from the Census 2011 10% sample

5. Contributions of indicators and dimensions towards (low) employability

Figure 1 turns to the composition of the employability scores and looks at the contributions of the indicators and dimensions for young people who are employability deprived. The picture shows that factors beyond individual attributes contribute greatly to low employability scores. This demonstrates the usefulness of a broad approach to employability that includes home and neighbourhood contexts. Economic opportunities contribute the most to youth's low score in employability, followed by social capital and connectivity commodities. While capturing different aspects, these dimensions all arguably denote networks of some sort and show how low employability levels concur with other forms of social exclusion. While the benefits of education and learning are hard to overstate in a youth development context, their dividends to employability are relatively low in this analysis. This points towards the interconnection of factors at play in employability.

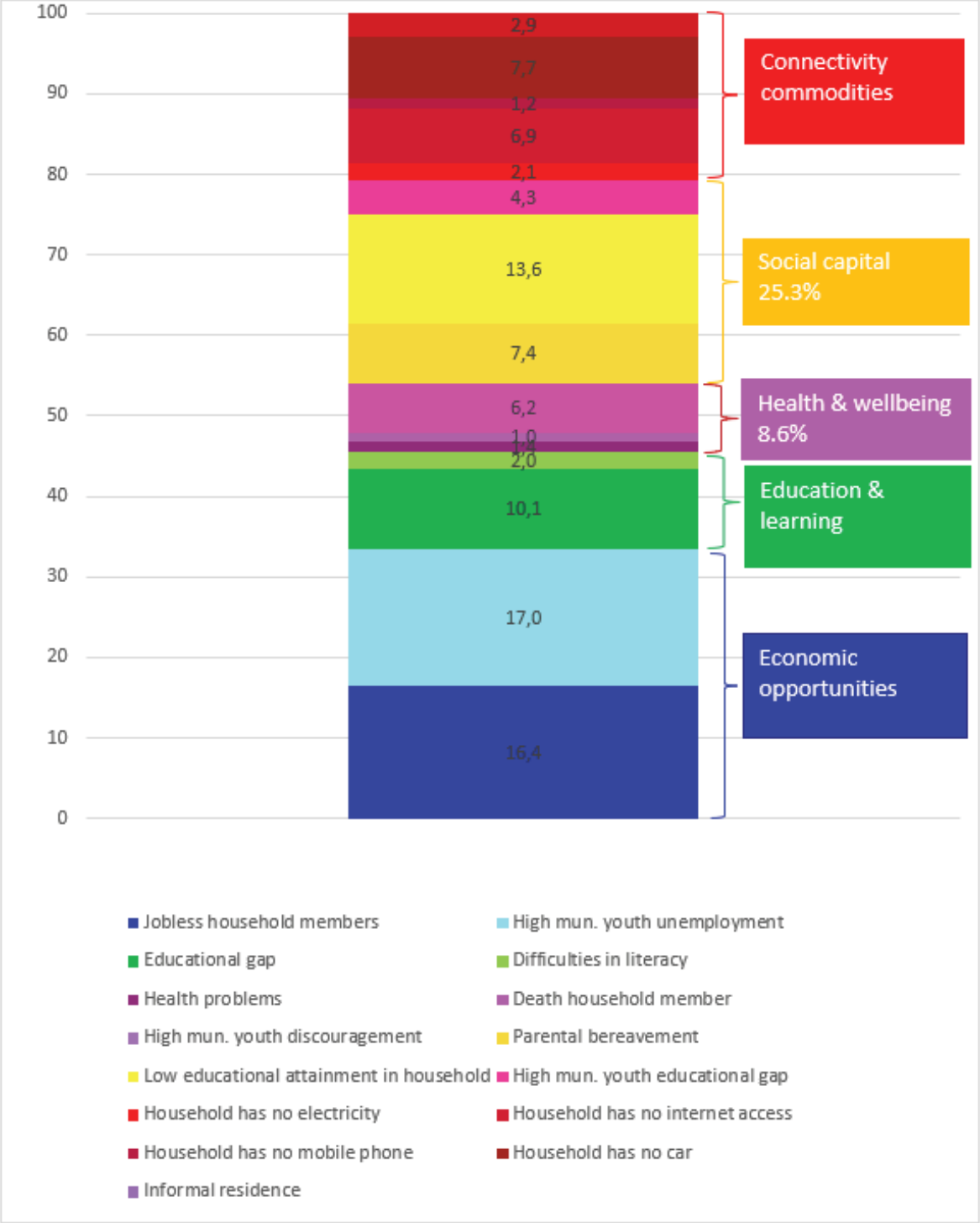

Figure 1: Contributions of weighted indicators a nd dimensions to the Index (MYEI)

Source: own calculations based on weighted data from the Census 2011 10% sample

6. Labour market status and employability

Table 3 details the breakdown of the youth population into those who are employability deprived and those who are not, by five employment statuses: employed; unemployed (wanting to work and actively looking for work); discouraged (unempl oyed, wanting to work, but no longer looking for work); and those that are not economically active. The three deprivation measures of H, A, and M0 for the employability deprived are also disaggregated by employment status.

The incidence of deprivation in employability is considerably lower for employed youth, at 33%, relative to unemployed and discouraged youth at 46% and 62% respectively. However, still a third of employed youth are deemed employability deprived. The M0 score of the employed, 0.15, is exactly half that of the discouraged, 0.3. The intensity is consistent across all statuses.

Table 3 : Contributions of weighted indicators and dimensions to the Index (MYEI)

	Not Deprived		Employability Deprived		Deprivation Measures		
Employment status	Count	%	Count	%	H	A	M0
Employed	79,930	19.1	39,598	10.4	0.337	0.449	0.151
Unemployed	77,167	18.4	66,486	17.5	0.462	0.460	0.212
Discouraged workers	17,421	4.2	29,226	7.7	0.626	0.494	0.309
Not economically active	244,269	58.3	244,069	64.3	0.498	0.476	0.237
Total	418,787	100	379,379	100	0.47	0.47	0.22

Source: Own calculations based on weighted data from the Census 2011 10% sample

Table 4 shows that 29% of formally employed youth are employability deprived, as are 48% of the informally employed. This might imply that formal employment "protects" young people slightly better than informal employment from low employability. However, the similar intensity of the deprivations among formally and informally employed youth raises questions as to why this protective shield would not be stronger. A potential answer lies in the type of formal employment young people tend to work in, with elementary work situated in sectors that are prone to precarious work and that may be insufficient to help young people tackle the multiple deprivations that render them employability deprived.

Table 4: MEI measures by sector

	H	*A*	*M0*
Formal Sector Employment	0.294	0.443	0.130
Informal Sector Employment	0.484	0.462	0.224

Source: Own calculations based on weighted data from the Census 2011 10% sample

Table 5 illustrates the heterogeneity of deprivation within the "employed" youth category when considering formal and informal work, again highlighting the inadequacy of a single measure such as "employment" to fully understand or depict a young person's employability. Even amongst the employed, informal employees who are not deprived in employability are on average much better off across the range of indicators than workers in the formal sector with low employability. These results suggest various important points. Firstly, it seems that the formal jobs young people acquire do not enable them to 'erase' deprivations and close gaps in education, household employment, health and other indicators.

Secondly, this finding cautions against the connotations that labels such as formal/informal evoke and how they may taint our perception of who is better or worse off. The results for youth who are not deprived in employability are similar, irrespective of youth being employed in the formal or informal sector.

Employability may therefore not be driven so much by employment, or the type of employment youth find themselves in (formal or informal), but rather by their type of work (elementary and entry level jobs that do not offer support for longer term changes in young people's lives). This finding points to the need for sustainable and decent work that enables youth to improve their lives and wellbeing.

Table 5: Deprivations among youth working in the formal and informal sector

Indicator	Formal sector		Informal sector	
	Not deprived	Deprived	Not deprived	Deprived
Jobless household members	16.32%	60.10%	15.83%	55.74%
High municipal youth unemployment	15.92%	56.63%	19.56%	58.11%
Educational gap	18.12%	65.85%	27.01%	76.75%
Difficulties in literacy	0.14%	9.38%	0.30%	15.34%
Health problems	5.66%	10.56%	4.57%	9.66%
Death household member	1.90%	5.67%	1.82%	4.34%
High municipal youth discouragement	3.17%	29.62%	4.43%	30.45%
Parental bereavement	26.49%	58.82%	27.89%	58.00%
Low educational attainment in household	67.00%	96.54%	73.57%	97.55%
High municipal youth educational gap	8.72%	30.54%	11.81%	32.22%
Household has no electricity	4.35%	24.58%	7.95%	28.14%
Household has no internet access	40.94%	78.04%	51.55%	82.98%
Household has no mobile phone	3.07%	14.40%	4.19%	16.62%
Household has no car	52.25%	90.99%	64.08%	91.80%
Informal residence	9.56%	34.16%	14.51%	33.79%
Sample (N)	26,227	64,032	8,155	7,393

Source: own calculations based on weighted data from the Census 2011 10% sample

7. Conclusion

We have presented a multidimensional understanding and measurement of youth employability to help unpack the complex interaction and impact of multiple vulnerabilities in the lives of young South Africans. We develop a measure for incidence (H), intensity (A) and an adjusted headcount score (M0) to evaluate deprivations in individual attributes and circumstances at the household and neighbourhood level that negatively impact on a young person's employability.

We find that 47.3.2% of South African youth (H) suffer low employability. Differences in incidence along racial lines and the urban/rural divide are vast, while intensities are similar.

The impact of individual attributes such as educational attainment and health are surprisingly low, given the strong link between employability, knowledge and skills, and their prominence in employability theory and practice [29]. Instead, networks of different kinds and factors at the household and neighbourhood level are the greatest drivers of low employability. This finding supports our starting point that contexts like South Africa require an adapted notion of what constitutes employability and one that moves away from the dominant focus on skills and knowledge.

The usefulness of the "employability" lens is evidenced in the more nuanced insights that it generates compared mployment" perspective, allowing us to further unpack the different outcomes and realities among and between youth with different labour market statuses. Youth in some form of employment are less likely to be employability deprived compared to those who are unemployed, discouraged, or economically inactive. However, a key finding is that a third of employed youth fall into the category of low employability. The composition and intensity of low employability are nearly identical irrespective of young people's employment status.

The implications of this observation contain a strong message for youth policy: employment is a highly beneficial but insufficient condition to improve youth employability. Employability deprived youth are found both in and out of employment. We argue that youth may be well served by policies and employment programmes that look beyond the creation of employment as a single measure of success and that also plan, implement, and evaluate support from an employability perspective. Concretely, this translates in a diagnostic evaluation of employability at local level to detect the dimensions in which young people require additional support. For instance, employment creation can be coupled to connectivity interventions (transport, mobile data, ...), counselling programmes (career counselling, dealing with discouragement and factors leading to school dropout, ...), and integrating and aligning employment programmes with local employers and their business interests. Embedding employment opportunities in opportunities beyond employment can help youth to build out more sustainable livelihoods.

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Appendix

Robustness checks for weighting and deprivation cut-offs

The weighting and cut-off choices applied require robustness checks to ensure that these decisions do not significantly skew the results [41]. The index is thus calculated for 234 municipalities with alternative weighting structures and different deprivation cut-off points. The relative rankings are checked for robustness to these changes.

Three alternative weighting structures are applied across the dimensions: (1) giving 40% of the relative weight to one dimension and 15% to each of the remaining four in turn; (2) giving 28% of the relative weight to one dimension and 18% to each of the remaining four in turn; and (3) giving 36% of the relative weight to one dimension and 16% to each of the remaining four in turn, as shown in Table 6. Rankings between mun icipalities were applied for each estimation, including the original estimation with equal weighting, and employment deprivation cut-offs of 1/3, and rank correlation coefficients were computed.

Table 6: Alternative weighting structures for the Youth MEI

Youth MEI Weights 1	Youth MEI Weights 2	Youth MEI Weights 3	Youth MEI Weights 4	Youth MEI Weights 5	Youth MEI Weights 6
20% EC	36% EC	16% EC	16% EC	16% EC	16% EC
20% Educ	16% Educ	36% Educ	16% Educ	16% Educ	16% Educ
20% H&W	16% H&W	16% H&W	36% H&W	16% H&W	16% H&W
20% SC	16% SC	16% SC	16% SC	36% SC	16% SC
20% CC	16% CC	16% CC	16% CC	16% CC	36% CC

Notes: EC – Economic Opportunities; Educ – Education; H&W – Health and Wellbeing; SC - Social Capital and CC - Connection Commodities.

Table 7 presents the Spearman's Correlation Coefficients of the alternative weighting structures based on alternative (3). These coefficients highlight the level of association between the alternative weights, with a coefficient closer to 1 highlighting higher association. With Spearman's coefficients ranging between 0.883 (weights 2 and 4) and 0.992 (Weights 1 and 6) for the alternative weight structures, the the alternative weight structures are highly correlated. The Spearman's Correlation Coefficients of the alternative weight structures based on alternative (2) and (3), not reported here, also reveal a high correlation of the alternative weight structures. Accordingly, the results suggest that the Youth MEI ranking does not depend strongly on the choice of weights.

Table 7: Spearman's Rank Correlation Matrix for different youth MEI using alternative weights

	Weights 1	Weights 2	Weights 3	Weights 4	Weights 5	Weights 6
Weights 1	1					
Weights 2	0.9744	1				
Weights 3	0.9669	0.9091	1			
Weights 4	0.9516	0.8828	0.9834	1		
Weights 5	0.9808	0.9423	0.9642	0.939	1	
Weights 6	0.9924	0.9743	0.9589	0.9412	0.9703	1
Total number of municipalities: 234						

Source: Own calculations based on weighted data from the 2011 10% Census Sample

Robustness checks for the Youth MEI deprivation cut-off point are also conducted. The index is estimated using different deprivation cut-offs, ranging from 20% – 80%. Using these different cut-off points, rankings between municipalities are applied for each estimation cut-off, and rank correlation coefficients were computed. Table 8 presents the Spearman's Correlation Coefficients of the alternative cut-off structures. These coefficients highlight the level of association between the alternative cut-off points, with a coefficient closer to 1 highlighting higher association. With Spearman's coefficients ranging between 0.817 (33% and 80% cut-offs) and 0.999 (33% and 20; 33% and 30%; 20% and 30% cut-offs), the alternative cut-off points are highly correlated. Accordingly, the results suggest that the Youth MEI ranking is quite robust to changes in cut-off points.

Table 8: Spearman's rank correlation matrix for different Youth MEI using alternative cut-offs

Deprivation Cut-off	33	20	30	40	50	60	70	80
33	1							
20	0.9988	1						
30	0.9992	0.9992	1					
40	0.9982	0.9975	0.9981	1				
50	0.992	0.9925	0.9916	0.9948	1			
60	0.9706	0.9705	0.9703	0.9753	0.9813	1		
70	0.9222	0.9225	0.922	0.9255	0.9318	0.9534	1	
80	0.8167	0.8181	0.8185	0.8218	0.8249	0.8277	0.8383	1
Total number of municipalities: 234								

Source: : Own calculations based on weighted data from the 2011 10% Census Sample

Notes

Selecting technology for capability development: An opportunity for more and better jobs? What we can learn from the construction sector

Christoph Ernst, Irmgard Nübler and Joyanna Pelivani

02

Selecting technology for capability development: An opportunity for more and better jobs? What we can learn from the construction sector

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Sub-theme: Promoting skills and productive (decent) jobs for our common better future

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CONTENTS

Abstract

The general trend towards a declining employment elasticity observed in many countries requires to produce more output to create the same amount of employment (Ghose et al., 2005, ILO, 2021), Current technology choices are increasingly labour-saving, which also contributes to the fact that more than 60 per cent of the employed worldwide are earning their livelihoods in the informal economy (ILO, 2018). This has motivated economists to rethink the role of technologies in the light of economic, social and environmental challenges, as well as to develop policy frameworks to influence technological development and the choice of technologies. In a recent contribution, Rodrik (Rodrik, 2022) suggested to revive the concept of appropriate technologies to achieve development goals. The concept of appropriate technologies has been introduced and elaborated by the World Employment Programme (WEP) of the ILO in the 1980s as a response to persistent unemployment and low productivity in developing countries. This paper suggests reviving the concept in the technology debate to demonstrate the value and potential of appropriate technologies for promoting multiple development goals in a developing country and informal economy context. Such a framework for technology choices allows to also discuss up-grading traditional technologies as a way for informal workers to increase productivity, and quality of their output. Up-grading traditional technologies also means altering the prevailing policy mix in favour of direct returns to the poor and informal workers without sacrificing productive development (e.g. adapting imported technologies already in use to suit local circumstances, redesign existing technologies with a view to incorporating new scientific and technological development, introduction of planning, reorganisation of work, improve production processes, resource efficiency or production inputs (Fluitman, F., 1981, Ahmed, I. 1982)). This process requires technological choices which support a learning process to build innovation capabilities in the local labour force, based on existing knowledge and routines, the use of local resources such as material, finance and institutions, as well as local innovation systems to induce knowledge flows from the formal to the informal economy, and blending of traditional and advanced technical knowledge. This paper will analyse how these types of technology choices in the construction sector of developing countries have led to a process of innovation and capability development and through this, to more and better jobs.

1. Introduction

Over 2 billion workers around the world or more than 60 per cent of the employed worldwide are earning their livelihoods in the informal economy (ILO, 2018). They suffer from low working conditions. For most women and men, working in the informal economy has not been by choice but by necessity, given the limited job opportunities in the formal economy and the absence of other means to gain income. Almost 1.6 billion of them have been considerably affected by the COVID-19 pandemic, leading to a decline in their earnings to about 60 per cent and undermining social cohesion (ILO, 2020). Moreover, there is a global trend towards a structural employment deficit, due to structural transformation and technology choices (ILO, 2005: The Global Employment Challenge). While new technologies lead to a structural employment problem in industrialized countries, the issue is different in most African countries. The continent suffers from lack of technological progress which could be translated into innovation, economic diversification, competitiveness and new productive jobs.

Poverty is related to low income, low productivity, which in turn may be explained by the inappropriate use they make of technology. Often, traditional local technologies are neglected, even though may have a high potential for innovation and capability development. Appropriate technology choices guarantee that the development may trigger a learning and thus a capability development process, be more inclusive, or human-centred in ILO terms, and create more and better jobs for the most excluded from the labour market, the informal workers.

The World Employment Programme, WEP (ILO, 1973), defines appropriate technologies as those production techniques which are the best fit to the resources and future development potential in developing countries. Rarely would a single technology meet all these objectives, but as several objectives are interlinked, it will often be possible to aim at an appropriate balance. Thus, the benefits of science and technology would extend to all, including low-income segments of the population. Up-grading traditional technologies[2] means altering the prevailing policy mix in favour of direct returns to informal workers without sacrificing productive development[3] . The informal economy has development potential in its own right, appropriate technology would embrace process and product innovations emerging from within the informal economy This process requires an innovation capacity of the local labour force, a learning process, based on already existing knowledge and routines and on the availability of local resources in terms of material, financing and institutions, which is explained in the capability development approach (Salazar-Xirinachs et al., 2014).

Literature on technology choice focuses mostly on efficiency and thus looking at the factor endowment only of a country, neglecting opportunities for capability development. Often, in developing countries with labour-abundant capital-scarce economies, such appropriate technologies often turn out to be rather labour-intensive. Nevertheless, the use of labour-intensive methods is only appropriated where these are technically and economically competitive (importance of feasibility and cost-effectiveness of appropriate technologies).

The aim is to strike a balance between labour absorption and productivity in the light of capability development. e.g., the balanced use of intermediate or improved labour-intensive methods with a high learning potential with capital-intensive ones. Appropriate technologies also means that they are socially and culturally acceptable, which explains the importance of a capability development approach. Labour force and entrepreneurs have the knowledge, competences, skill and mindsets to search for new technologies and products and to solve problems in an environment of scarcity, and traditional institutions, knowledge and attitudes. Imported technologies may often be too expensive, difficult to get and to maintain, but they may inspire informal workers to adapt them to the local context.

[2] Traditional technologies are those if, unaffected by modernisation, have been commonly applied in a certain environment for a longer period. They are typically applied in the rural subsistence and urban informal sectors. Traditional technologies tend to be cheap, easy to produce, apply maintenance and repair; they rely largely of not exclusively on locally available resources. But they rely too much on labour in relation to output.

[3] Examples are as follows: adapting imported technologies already in use to suit local circumstances, redesign existing technologies with a view to incorporating new scientific and technological development, introduction of planning, reorganisation of work, improve resources efficiency, improve production inputs (Fluitman, F., 1981, Ahmed, I. 1982).

Local resources, meaning local material, human resources and capabilities, but also financial resources or methods of producing and working, based on local beliefs and value system and the local institutional setting are often very valuable inputs. They may build an "appropriate" technology in this specific context. Innovative ways must be found to stimulate or rescue local knowledge and resources to create an appropriate technology which will help informal workers and units to grow and to develop their capabilities. This will support them to increase their productivity and income and improve their working conditions on their way towards formalization.

2. The selection of technology in developing countries: a review of the debate

This chapter discusses the different models to explain the choice of technologies. While goods and services in most sectors may be produced with a range of different technologies, the question is what technologies countries should choose, and would be the best or most appropriate technology. The selection of technologies is critical because it tends to have important implications for the development process of countries. Technology choices are, therefore, strategic decisions for development. Economics has developed various models provide arguments for preferring one technology over others. The challenge for policy makers is to take these different models into account in designing policies to target certain technologies for achieving goals. This section distinguishes between models of technology choice which are developed in mainstream economics which provide efficiency as the selection criteria and aiming at increasing productivity, and those which consider the specific context of countries. The latter models relate to appropriate technologies with regards to local conditions and multiple development goals and upgraded models such as blended technology. However, it also discusses dynamic models of technological choices which focus on appropriateness of technologies in a context of learning and building technological and innovation capabilities in the labour force.

A. Efficient technologies as the engine of productivity growth

The efficiency model of technological choice considers selecting those technologies which produce a certain good or service in a way that leads to efficient allocation of production factors and scarce resources in the economy. This model is developed within the traditional neoclassical economic paradigm which views technological progress as the main engine of productivity growth, income and wealth. It therefore suggests selecting those technologies which are relative intensive in those production factors which are abundant in the economy. This will save on the scarce and therefore relative costly resources, and therefore, productivity increase is achieved with least cost solutions.

Developing countries which are abundant in labour when compared to capital and human capital, need to adopt labour intensive production technologies to achieve an efficient use of resources. The model suggests selecting technologies which combine resources in a way that maximizes productivity and productive capacity, and thus, the return to investment in new technologies[4]. These models consider technological progress and productivity growth as the road to development by assuming that productivity gains of new technologies will trickle down to workers which will then "rise all boats".

Many development economists, including decision makers in developing countries adopted the view that developing countries will rapidly catch up through the transfer of advanced technologies, create productive industries and good jobs, and high income. Developing countries therefore aimed at catching up in productivity, technologies and in the product structures of developed countries. New industries were established, and advanced technologies were transferred through different channels such as through Foreign Direct Investment (FDI), joint ventures, licensing, or reversed engineering. Some of these technologies are relative labour-intensive like in the textile industries. This was important for industries producing goods for which high quality requirements exist in domestic and /or import countries. They

[4] The aim of economic growth models is to choose a technology that provides the highest total factor productivity, a terminology, which is rather unclear, or a global technological border, also a rather diffuse notion.

often have no choice but producing with advanced technologies, that is, capital, human-capital and knowledge intensive technologies. This is for example the case for continuous processing technologies in the steel industry or to produce pharmaceuticals.

During the 1970 and 1980s, it became clear that developing countries need to rethink the neoclassical choice models the selection of technologies. They seemed to be appropriate in countries which produced the frontier technologies and were producing with cutting edge technologies, but often not appropriate in countries which produce far inside the frontier. The efficiency model is based on many rigid assumptions which are far from the realities in developing countries, and thus, may not be the best model for technology choice in a context of informal economic, and low skills of workers. Societies in developing countries have still limited capabilities to adopt, adapt, use and maintain advanced technologies transferred from industrialised countries.

Therefore, new models were taken up and further developed to explain technological choices in a development context. The technology choice proposed by these models was guided by the desire to promote certain development goals, meet aspirations of societies and to provide solutions to a society's most pressing needs. The concepts of the informal sector and of basic needs developed by the ILO in 1972, as well as the models of structural transformation proposed by structuralists, local development, pro-poor development models, and the more decent work concepts of the ILO iden tify technologies as instrumental in promoting development goals. This view recognises technologies not only as the productivity growth engine but understand that different types of technology contribute to different development patterns and paths, and they shape different social, economic and environmental development outcomes. These development models establish a link between the properties of technologies and the goals that can be achieved. Francis Stewart explored the technology issue in the context of developing countries during the 1970s and concluded that it is rather the technology choice than investment which determines the development path and the creation of quality employment (F. Stewart, 1977)[5].

B. Traditional technologies and local development

Local development models discuss technological choice within the local context and the particular environment in which development takes place. This shifts attention to the local resource endowment, local knowledge and local institutions. Promoting local development implies choosing technologies which use local resources such as local material and resources, use indigenous knowledge and knowledge about local conditions, culture, traditional institutions, norms, and customs, and use traditional designs.

Traditional technologies are those largely unaffected by modernisation which have been commonly applied in a certain environment for a longer period and are typically applied in the rural subsistence and urban informal sectors. Traditional technologies tend to be cheap, easy to produce, apply maintenance and repair; they rely largely but not exclusively on locally available resources. Traditional technologies also rely heavily on labour which contributes to achieving good labour market outcomes and employment goals but is reflected in low productivity.

Often, traditional local technologies are not in the focus of academic discussions, even though they may have a high potential for the local and even national development. Up-grading traditional technologies means for informal workers to find ways to increase productivity or quality, produce faster, safer, cheaper, better, or to create additional jobs and protect the environment.

C. Appropriate technologies and multiple development goals

The concept of appropriate technologies, introduced by the WEP of the ILO, was developed for the context of developing countries to solve the problem of under- and unemployment in urban and rural economies, while at the same time overcoming low productivity in the informal economy. This was the proposed strategy to help workers in the informal sector of the economy to meet basic needs, a concept which was develop along the concepts of informal sector and appropriate technology. Hence, promoting workers in the informal sector, meeting basic needs, and appropriate technologies form a development framework

[5] See also Cimoli and Soete, 1992 explaining the importance of technology choice for growth and development.

which shifted the focus from the dominant economic growth-based models to a human-based framework of economic development.

The concept of appropriate technologies has two sides. On the one hand, it takes a development perspective, asking what the needs of people and what goals need to be achieved to meet these needs. Technologies and innovations are considered to play a key role in promoting development goals and driving sustainable development., In this sense, the WEP (ILO, 2020)[6] defines appropriate technologies as those technologies which grasp best the future development potential of an economy. On the other hand, in a developing country context, appropriate technology also embraces the concept of local technologies. It implies considering cultural, environmental, and economic conditions.

Appropriateness therefore can be interpreted in terms of the development path and the goals to be achieved, as well as in terms of using local resources and knowledge, local beliefs and value system and the local institutional setting, being simple, low-cost, and easy to use and maintain. Innovative ways must be found to stimulate or rescue local knowledge and resources to create an appropriate technology which will help informal workers to generate productive jobs, and informal units to grow, increase their productivity and income and improve their working conditions.

Many countries, have deliberately applied policies and developed rules and regulations to adopt labour-based or employment intensive methods for constructing infrastructure. In the Philippines, the use of labour-based methods has been introduced into the national legal framework. The Batas Pambansa Republic Act 132, for example, required the application of labour-based techniques whenever technically feasible. Two other conditions are that the cost for its use should not exceed the best alternative option by more than 10 per cent and that the duration should not exceed the best alternative option by more than 50 per cent. Additionally, an Executive Order (EO 94 from April 1999) and a Department Order (183) also encourage the promotion of labour-based methods, which were then incorporated in the current national Medium-Term Development Plan. The Government of Tanzania took similar steps to promote employment creation in infrastructure projects. It even created a Labour-Based Technology Unit (LBTU) within the Ministry of Public Works the task of which has been to enhance and strengthen this technique in public programmes and investments.

D. Blended technologies and frugal innovations

The WEP further expanded the study of appropriate technologies for developing countries aimed at generating higher levels of employment. In the new context of the 1980s, the WEP particularly focused on the scope and application of the concept of 'technology blending', defined as "the constructive integration of newly emerging technologies with traditional economic activities" (ILO, 1985, Sen, 1975). Thus, the benefits of science and technology would extend to all, including low-income segments of the population. Up-grading traditional technologies means altering the prevailing policy mix in favour of direct returns to the informal workers without sacrificing productive development. Examples are the adaptation of imported technologies already in use to suit local circumstances, the redesign of existing technologies with a view to incorporating new scientific and technological development, introduction of planning, reorganisation of work, improvement of resources efficiency or improvement of production inputs (Fluitman, F., 1981, Ahmed, I. 1982).

Blended technology was developed for micro, small and medium-sized enterprises in developing countries, but also in education and training to improve business operations, increase productivity, and enhance economic opportunities. Most recent innovations in infrastructure allows blending of information and communication technologies with traditional technologies used in micro and small businesses. They allow providing online training and resources for small businesses in the informal economy, or the use of digital platforms and applications for digital wage payments to support poor people in meeting decent work and basic needs[7].

[6] ILO, 2020. The World Employment Programme (WEP): Past, Present and Future-Background Paper for the 50th anniversary of the launch of the WEP. Geneva: ILO. wcms_759397.pdf (ilo.org), consulted on 24 May 2022.
[7] For example, the ILO established the Global Centre on Digital Wages for Decent Work to accelerate the transition from cash to responsible digital wage payments.

Blended technologies are therefore a means to achieve various social and environmental goals by setting standards for quality, safety and health, and to use elements of advanced technologies to meet these standards in a developing country context. International labour standards, human rights frameworks, international agreements to protect the natural environment and the 2030 Agenda promote economic, social and environmental goals define such standards, and it needs up-graded technologies to provide technological solutions. Local technologies are blended with advanced technologies to prevent disruptive impact on workers' occupational health and safety or environmental integrity.

The recent discussion of so-called frugal innovations aims to promote technologies and innovations in a context of scarcity, vulnerability and poverty. The discussion may be seen as a response to the debate on frontier technologies which tends to raise significant attention at the multilateral levels. Frugal innovations are discussed in the context of sustainable development as they help to promote social, economic and environmental sustainability and are a means to resolve conflicts between these various goals (Albert 2019).

E. Building dynamic capabilities for innovation, diversification, structural transformation

Recent work at the ILO has been taking up an important work stream of the World Employment Program during the 1980s and 1990s which focused on the dynamic perspective of technological change. This research explores the central role of capabilities embodied in individuals, in the team of enterprises and in societies, in enabling the adoption, adaptation and further advancement of technologies. Such dynamic capabilities are the foundation for innovations, diversification into new products and structural transformation. The experience with specific technologies, the mix of skills and type of knowledge acquired, the mindsets and attitudes would enable them to move on to new activities and to upgrade and advance production methods and processes. Dynamic capabilities are so important because they determine the future path of technological change, the feasible products which could be developed and the dynamics of this process (Nübler 2014, Neffke 2023).

Dynamic capabilities (often discussed under names such as technological capabilities, innovation capabilities, social capabilities) do not emerge automatically. Rather, they evolve in a learning process, and the nature of technologies used in production shapes learning and determines the type of capabilities which are acquired by the labour force. The workplace is an important place for learning such capabilities, and the nature of technologies applied in enterprises determines the learning opportunities. Some technologies imply more learning, accumulation of skills and competences than others. The value of investing in a particular technology needs to be measured against the learning options and the potential to create dynamic learning effects (Dahlman et al. 1987: 762: King, K., 1996[8],).) In other words, this dynamic view introduces a different perspective on appropriateness of technologies and calls for assessing appropriateness in terms of the contribution of technologies to learning, to building an increasingly sophisticated set of technological capabilities in the labour force, and to driving learning paths which open many opportunities for diversification into new goods, services and industries, and the generation of productive jobs.

This dynamic development model suggests countries to recognise the strategic role of technologies in shaping learning opportunities and innovation capabilities. Governments need to develop a vision on the future development paths and to enter a social dialogue to create a consensus between all parts of society on the way forward (Nübl er, 2014, 2018). Advanced technologies may therefore be transferred to developing countries to inspire informal workers and entrepreneurs to use part of them or to imitate them and thus to acquire new knowledge and expand the dynamic capabilities.

The dynamic perspective recognises the development potential of the informal economy in its own right, and that appropriate technology would embrace process and product innovations emerging from within the informal economy (Shutz, J., 2005[9], (Qiand, Ghossein, 2020, Ohnsorge, Yu, 2021). The "Local production

[8] King, K., 1996 : Change and Development in an Informal Economy. London: James Currey.
[9] Shutz, J. 2005. Tecnología y Sociedad. Revista de Estudios Sociales, no. 22. Tecnología y Sociedad (scielo.org.co), consulted on 23 May 2022.

and innovation systems" (LIPS) model explains how innovation potentials in informal economies are shaped by traditional skills, domestic knowledge, and local beliefs and culture, and how capabilities are strengthened through links between the informal and formal economy thus promoting the flow of different types of advanced technical and organisational knowledge, tacit knowledge as well as new beliefs and mindsets. (P Lastres, H. M. M., and Cassiolato, J. E. 2018; Petersen and Kruss 2023). This model contributes to the "design and implementation of innovation and industrial policies that take into account the unique structural nature of African economies, in which the informal sector is prevalent." (Nazeem Mustapha et al.;2022)

F. The need to strike a good balance

This review of models for the selection and development of technology demonstrates the need to strike a good balance in terms of the different goals to be achieved. To the extent that Governments have the power to shape technological change and innovations, they need to act responsibly in the light of different development goals and aspirations of society. Both static and dynamic aspects need to be considered, because the various development goals and learning objectives are interlinked. The goal is to strike a balance between labour absorption and productivity in the light of capability development and sustainable development goals. This suggests blending local technologies for intermediate or improved labour-intensive methods with high learning potential.

Another area of trade-offs between environmental and economic goals needs to be addressed as they are widespread. It requires political choices and setting priorities between the various goals of efficiency and productive capacities, employment and environmental friendliness. The concept of frugal innovations gained prominence in this debate since it aims at saving scarce resources at the local level, reducing complexity of technologies so that it can widely be used, for example, in providing solutions for the supply of clean water and air. These technologies, however, may lose out in efficiency and productivity. The following statement reflects this issue: *"it might be worth putting more emphasis on the development of individual low-cost water purification plants, which could easily be transported from a central manufacturing unit, than on the larger, untransportable (and therefore unduplicateable) village level plants built by the villagers themselves. The question here is not only whether a particular technology is inherently subject or not to the effects of learning curves and economies of scale, but also whether the mode of production, the system of diffusion of innovation and the method of operation of the extension service is not in itself a much more important variable in this respect than the technology as such."* (Jequier, 1977, p. 13).

The technology of Interlocking Stabilized Soil Blocks (ISSBs) represents an example for balancing economic, social and environmental development goals. While this might not be a new technology, it provides an example of an appropriate technology that has been used for many years in various countries, particularly in Africa (i.e., Rwanda, Kenya, Uganda, and Tanzania). The use of ISSBs in construction is a simple and affordable way to produce bricks made of locally available materials, such as soil, sand, and cement, without the need for firing in a kiln. ISSBs are compressed blocks that interlock with each other, creating a stable structure without the need for mortar or skilled labor. This technology is thus more labour-intensive than alternative construction technologies and provides employment, learning and income-generating opportunities for local workers of low qualification.

The choice of technologies is also a choice between static and dynamic goals. There tends to be many trade-offs between technologies which are appropriate in terms of employment creation, and the learning goals. Technology, industrial and innovation policies need to strike a good balance between the (immediate) employment goal and injecting new technologies and even developing new industries which use advanced technologies to provide learning opportunities for the labour force. The trade-off will be resolved by shaping dynamic development paths which open wide opportunities for employment in increasingly sophisticated jobs and occupations, and thus also a dynamic process of learning in the world of work. Empirical evidence shows that it is diversification into new products and industries which generates higher competitiveness and better and more productive jobs. To generate and maintain such a dynamic process, developing countries need to recognise the innovation potentials of both, the informal

and formal economy, and to strengthen links in local innovation and productions systems for the flow of advanced technological knowledge.[10]

3. Selection of technology in the construction sector and its employment dimension

The following chapter will put the contextual discussion in the concrete context of the construction sector, illustrating it with examples from African countries. In addition, it demonstrates its relevance for all types of economic sectors highlighting two cases in manufacturing and services.

A. Support of local knowledge and appropriate technologies

Measures to promote the use of domestic resources and inputs in infrastructure projects contribute to the development of local knowledge on how to adjust "ways of doing things" and to use these resources effectively in the construction of infrastructure. Such knowledge may be created during the construction phase through a process of trial and error where local firms solve problems by developing idiosyncratic knowledge. It may also be the result of research and development (R&D) and exploring the properties of local material, or of cooperation between research institutes and the private enterprises implementing the infrastructure project.

Such local knowledge is transferable between different activities within a specific context. Knowledge on the properties of local inputs and on how to adapt the procedures and other knowledge elements for effective infrastructure technologies acquired in one project can be applied in the construction of other infrastructure or in developing new goods and services. The high tradability and transferability of such new knowledge enhances the capabilities of enterprises and society to innovate.

Government policies play an important role in supporting such learning. Measures need to help firms to adapt technologies and develop the local knowledge components, to provide incentives for the use of local material, resources and equipment in infrastructure projects. The government also plays a role in supporting R&D directly through public or sponsored private research centres and through the effective divulgence of these methods to the contractors involved in infrastructure investment. This was the case in South Africa, where the Government supported the development of Cold Bitumen technology. Governments may also develop institutions that create trust and cooperation between research institutes and the production sector and promote the cooperation of firms within industrial clusters within the framework of joint research projects.

In short, policies and institutions promoting the development and adaptation of technologies while using local inputs and the development of local knowledge elements enhance technological, innovation or dynamic capabilities; consequently, they enhance the options for productive transformation. These effects are supported by strong backward linkages throughout the domestic economy not only using local material in infrastructure development but also through the creation of additional income at the local level (income-induced effect). In addition, infrastructure needs maintenance on a regular and frequent basis and local inputs are more readily available than imported goods. They imply low transport costs and lower related carbon emissions, and they avoid possible import-related leakages.

[10] Empirical evidence shows the limited success in many developing countries of developing strategies which assume the dual model of development (Fei and Ranis), which suggests a process of shifting the labour force from the traditional and informal sector into the modern and formal sector for employment. This thinking was taken up by the catching up model. However, most countries were unable to develop the dynamic capabilities in the labour force of the formal economy to generate such a transition process. Rather, the informal economy was growing in many countries, and middle-income countries got stuck in the middle-income trap (Nübler 2023).

Senegal provides an example for the development of local knowledge and technologies which make effective use of local material and equipment, lead to frugal innovation and create additional employment opportunities at different skills levels. The Compressed Earth Blocks (CEBs) used for building construction, are made by using locally available materials. The technique has been promoted by local associations since 2000. Local masons are trained in the technique of building vaulted roofs using CEBs, which has been a traditional construction technique in West Africa for centuries. The use of CEBs and vaulted roofs provides a cost-effective and environmentally sustainable alternative to conventional building materials and techniques. It has also developed local knowledge and skills related to CEB construction by re-combining existing, related skills with new complementary skills needed for CEB construction. It thus provided employment opportunities for unskilled and semi-skilled workers in construction. Lastly, the use of CEBs, and vaulted roofs can be seen as a source of pride and identity for local communities. As it is a traditional building technique that is well-suited to the local climate and cultural context, the technology is thereof appropriate in terms of local sources (i.e., materials and workforce), environment and culture.

An additional argument is that also locally produced intermediary goods and equipment contain substantial local knowledge. The local bodies of knowledge on the properties of the material, and the weather and climate conditions which are embodied in the intermediary goods and equipment, which can be transferred and used in new economic activities and new circumstances. New and old traditional, related skills and knowledge are combined for the creation of a new product. An illustrative example of this is the use and development of locally produced equipment in Zimbabwe, which was initiated through the establishment of a rural road maintenance system by the District Development Fund in the 1980s. This equipment is still being produced and used in the country.

The basic equipment is a very common agricultural tractor, which has been extended to become a tractor-drawn, towed grader. It has a relatively large backup service compared to specialized heavy equipment such as motorized graders, and is cheaper to own, operate and repair; it is also easier to maintain and operate. Finally, since 1951, not only have all the tractor-towed items been locally manufactured within the country but all current model spares continue to be compatible with the earliest machines. The tractor can be used for dry and wet season activities. It is thus fully utilized throughout the year and the equipment parts required are limited. Another use of the tractor, combined with the trailer, is to transport labour and materials for road maintenance. Briefly, tractor technology is supposed to be part of a natural progression from simple labour operations to sophisticated heavy equipment roadworks, regarding capital requirements (Petts, 1996 and Grongera, Petts, 2003).

B. Mobilisation and development of knowledge and routines in domestic firms: The case for new procurement rules

Domestic firms play a central role in economic transformation by developing capabilities as they develop the potential to diversify into new products and services. The challenge of policies and institutions in infrastructure development is, therefore, to promote participation of domestic firms and local contractors, and to provide the enterprise team with opportunities for learning and for developing effective organizational, technological and management routines during the infrastructure development process. The case of public procurement rules and frameworks is an interesting showcase to demonstrate how the public sector could promote the participation of smaller firms into the development of product and process innovation, into learning in general and the development of new local routines.

Public procurement represents on average 13 per cent to 20 per cent of GDP world-wide. In Africa, countries spend an average 17 per cent of their GDP on public procurement. While the significant public spending through public procurement has a significant impact, not all public procurement systems are developed in favour of MSMEs growth supporting their transition path towards formality (Leung, 2023[11]).

[11] In this paper, you can find more and similar country experiences outside Africa, e.g. on Chile, Republic of Korea

Procurement policies are an effective tool with which to mobilise and protect domestic firms and small contractors, and open opportunities to them for gaining experience, learning and building capabilities and new routines in implementing infrastructure projects. Public procurement is often a major challenge for smaller companies wishing to participate in infrastructure investments projects as it often requires conditions that are difficult if not impossible to fulfil. Consequently, procurement policies need to be designed in such a way as to ensure that small enterprises find it easy to gain access to the bidding process for infrastructure projects. In addition, public procurement provides an entry point for governments to impose conditions that also enforce the learning process.

South Africa has established a successful "Targeted Procurement" system and established effective public procurement rules that provide criteria for access of small firms and disadvantaged groups to the bidding process (Addo-Abedi, 2011). According to the rules, smaller contracts below a financial threshold can have direct access to the bidding process because they belong to disadvantaged, marginalized or vulnerable groups of people. They can participate even though they do not fulfil all the requirements related to available resources, capacities, or expertise. Above the predetermined thresholds bidders compete on economic and social targets, such as the number of workers employed or the wage share in total costs. Incentives are provided to train the labour force. There is an extra bonus if workers also benefit from a training programme to upgrade or develop their technical skills.

This procurement system guarantees the achievement of social benefits at a low cost for the public sector. In this process, the contractor has the flexibility to decide on how to use the targeted workers in the production process, instead of following strict prescription by the public sector on technology choice, and the way in which their workers would be involved.

Large companies may have the obligation to sub-contract to smaller firms for the implementation of major infrastructure projects enhancing business linkages and the development of smaller firms. There are no implicit rules governing the transfer of technology from larger to smaller companies, although to be cost-effective, these transfers are often in the interest of large firms, which then set their standards to smaller firms, share their knowledge and train them on new technologies.

The competences of governments and the procedures it has developed in "doing business" with contractors are important factors in allowing domestic firms to take full advantage of their options. An interesting study from Kenya shows that contractors have developed significant capabilities to build infrastructure, but the poor performance of governments has limited the ability of contractors to exploit opportunities. A recent tracer study has been carried out by Omari in 2008, to assess the impact of capacity-building projects in the context of small-scale, labour-based road construction. The five contractors involved in the projects had established and registered their respective companies within the last ten years for road construction and maintenance works. Four of the companies had developed new capabilities to participate in the development of new infrastructure projects. They reported growth in annual turnover, the creation of gainful employment and the successful completion of awarded contracts. Three contractors experienced substantial growth in hand-tool holding and staffing, one of the contractors indicated minimal growth, while another had closed the business. In short, four out of five companies were able to transfer the acquired knowledge and new routines they had created to the development of new infrastructure projects. However, the competences of the government to allow companies to take full advantage of their options were limited. The following major obstacles were identified: limited access to bank finance; long delays in receiving payments for work accomplished; cumbersome tender procedures; and biased and corrupted contract award practices. In summary, most obstacles are related to the limited competences of governments (practices, procedures) and local financing procedures.

C. Promoting procedural learning

Competences of workers and firms are embodied in procedures that they have acquired through experience. Procedures are tacit forms of knowledge that cannot be articulated or codified. They can be acquired only through a gradual and incremental process of observation, imitation and practice. This learning process is accelerated by direct interaction and collaboration between an expert and the learner,

or between the high-performing, competent enterprise and the learning organization. By working side by side, workers learn by observing the performance of the skilled workers, and by imitating and practicing, while receiving feedback from the expert on how to improve their performance to meet occupational standards. Formal, but also informal apprenticeship training[12] provides such effective learning arrangements where the apprentice works side by side with a master craftsperson or an expert building occupational competence of workers. Infrastructure projects provide excellent opportunities for making apprenticeship arrangements and developing the occupational competences of workers (Nübler 2014).

The same is true for firms. Joint ventures and partnerships between foreign and domestic firms are an important way to transfer technical, organizational and management routines effectively. History provides us with some interesting examples of when infrastructure constructing projects provided partnership arrangements between foreign sub-contractors and consulting firms on the one hand, and domestic firms on the other hand. For example, British engineering firms played a decisive role in the diffusion of railway transport technologies. There was a rapid transfer of this technology from British to local firms in what is today the industrialised world. Another example involves the legendary contractor Weetman Pearson, a British firm, which, at the turn of the twentieth century, undertook the construction of a series of major tunnels in the United States – the Hudson River tunnel, the Blackwell tunnel, and the East River tunnels – transferring the technologies to domestic firms through repeated cooperation.

D. Appropriate technologies and learning processes for development in other sectors

The right use of technology to enhance a developing process at the local level including informal workers has been extensively explained for the construction sector, but it is not just limited to this specific sector, but to an any sector. South Africa brings another good example of development process in the manufacturing sector. The 3D printing or "additive manufacturing", has been used in the country as a way toward technological and economic development. The country has invested in 3D printing technology as part of its efforts to promote innovation and support for local manufacturing. South Africa has a growing 3D printing industry, with companies using the technology to produce aerospace components, automotive parts, and medical equipment. In addition, South African universities have integrated 3D printing into their curricula, providing students with hands-on experience and training in this emerging technology. The country has also established 3D printing hubs and innovation centres, such as the Stellenbosch FabLab, which provide resources and support for entrepreneurs and start-ups looking to leverage 3D printing for their businesses.

The company Aeroswift, which is a collaboration between the Council for Scientific and Industrial Research (CSIR) and local aerospace firm, Aerosud Innovation Centre uses 3D printing to produce large metal components for the aerospace industry. The manufacturing process adopted by the company has also used locally sourced materials in their 3D printing of lightweight aerospace components, specifically, titanium powder, which is sourced from local suppliers. This approach helps to support the local economy and reduces the cost of raw materials, which can make 3D printing more accessible to a wider range of users. By using local materials, Aeroswift has been able to take advantage of the unique properties of these materials and develop new applications for 3D printing technology. Although, titanium has been employed in 3D printing for several years in aerospace industry, Aeroswift was among the first in South Africa to use 3D printing technology to produce titanium parts, which helped to establish the country as a leader in the field while using locally sourced titanium. In turn, this approach has opened new opportunities for local firms to participate in the global aerospace supply chain, leading to economic growth and job creation in the sector.

[12] C. Hofmann et al. (2022) show the effectiveness of informal apprenticeship and the importance of its recognition.

In South Africa, 3D printing supports informal workers in their transition to the formal sector. The Makerspace program at the University of Johannesburg (UJ) in South Africa, provides training and access to 3D printing technology for small business owners and entrepreneurs in the informal sector. Through the program, participants learn how to design and manufacture products using 3D printing technology, as well as gain valuable skills in marketing, sales, and business management. This enables them to become more productive and thus competitive, as they can produce higher quality and more sophisticated products.

Furthermore, the program provides access to formal sector markets, as UJ links participants with potential buyers and investors, thus gaining access to new markets and expanding their businesses.

An interesting example of appropriate technology that combines service sector with agriculture, energy and manufacturing can be found in Costa Rica. Eco-lodges can play an important role in promoting innovation and learning in the tourism industry and providing interesting employment opportunities for locals. Many of the eco-lodges in Costa Rica are in rural areas, where traditional industries such as agriculture and forestry are in decline affecting negatively the livelihoods of the local communities. Eco-lodges help create alternative sources of income for those communities, by employing local workforce. Also, since the access to infrastructure services is limited in the rural areas where eco-loges are located, the use of the appropriate technologies is especially important for promoting sustainability and reducing environmental impact, while meeting the local infrastructure needs.

Eco-lodges can promote innovation in the whole value chain of tourism through the community development projects they are implementing. By working with local communities to identify their needs and priorities, eco-lodges can help to create opportunities for innovation and learning. Such an example is the Finca Luna Nueva Lodge in Costa Rica, which has installed a biodigester system that produces biogas from organic waste generated by the lodge's kitchen and nearby farms. The biogas is used to fuel the lodge's stoves and hot water heaters, reducing the lodge's dependence on fossil fuels and cutting its greenhouse gas emissions. The biodigester system was developed in collaboration with local farmers and researchers from the University of Costa Rica, who provided technical expertise and support. The system has also provided a model for other lodges and farmers in the area, who have adapted and implemented the technology in their own operations. By promoting the use of biodigesters and other appropriate technologies in this way, eco lodges in Costa Rica are helping to reduce environmental impact and promote innovation and knowledge sharing in the local community.

Working closely with local suppliers, eco-lodges build sustainable supply chains that support local businesses and communities. The Lapa Rios Ecolodge like many other lodges in the country, work with local farmers to source organic produce for their restaurants, or with local artisans to source handcrafted goods for their gift shops. This lodge has also implemented a variety of measures to conserve water and promote sustainable tourism. They have installed rainwater harvesting systems, composting toilets, and low-flow fixtures, and have also established a tree nursery to support reforestation efforts in the region. Another example is Finca Luna Nueva. The lodge has developed a value chain for organic farming by working with local farmers to produce their own line of organic herbal remedies and offer workshops to develop their skills on the production of natural products. By doing so, the lodges impact the skills provision, create jobs for the local communities, new markets for local products and promote local entrepreneurship and innovation, while applying environmentally sound infrastructure through appropriate technological approaches.

4. Conclusion

The major lesson we can draw from this analysis is that the selection of technologies in developing countries is a complex issue. The framework used for the analysis recognises the relevance of each of the various models, depending on the economic, social and environmental goals to be achieved. It also shows that some models explain more short- and medium-term goals while others take a long-term learning perspective. Policy makers therefore need to develop a vision on the future, and the way forward, to guide the selection of technologies. Given the multiple static and dynamic development goals, the challenge is to strike a good balance between these goals.

This framework can also be applied for the analysis of technologies for the construction sector. The case studies presented in the paper demonstrate that depending on the specific context, the local conditions and the development goals to be achieved, efficient, local, appropriate or blended technologies may be selected. In a context of sustainable development, the construction sector may not only contribute to progress in the Sustainable Development Goal 8, but also generate learning opportunities and contribute to building capabilities which in turn open new space for technological change, innovation and structural transformation.

To reach this goal, it is important to understand best the availability of the local assets in a country: labour force, the formal and informal assets, tacit or non-tacit knowledge and routines. These are key elements to develop further technologies which enhances the already existing assets of a country. The illustration of the infrastructure sector highlighting some concrete technology examples shows the potential of the right technology selection for learning and for a more inclusive development path. This reflects the idea of a "human-centred approach" to technology in support of Decent Work which was supported by the ILO Centenary Declaration for the Future of Work (ILO, 2019).

The State has an influence through industrial and associated policies to orientate the economy, the private sector in a certain direction which guarantees a virtuous circle of learning and innovation leading to a structural transformation process bringing a country to a more inclusive development path. This also needs a joint effort of workers and employers, - in the formal and informal economy, and the support of public policies, institutions and rules to be effective.

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Notes

Employment impact assessment of the National Feeder Roads Programme, Rwanda

Alina Game and Xi Kang

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About the author

Alina Game is a Technical Project Officer and GIS Expert working on applying geospatial data and methods to assess the employment impacts of infrastructure investments as part of the International Labour Organisation STRENGTHEN2 project.

Alina has a background in GIS and remote sensing, having previously worked on its applications for decision-making and policy setting, with a focus in sub-Saharan Africa.

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CONTENTS

Abstract

Assessing the long-term employment impacts of road interventions is important to understand the lasting effects that infrastructure projects have produced, towards the creation of more and better jobs. Although arguably the most important employment effects, these long-term impacts are usually the most difficult to measure in employment impact assessments (EmpIA). Roads improve long-term employment outcomes through reducing transport costs and increasing accessibility to the labour market, economic and social infrastructure. The use of geographic information systems (GIS) data and methods to conduct EmpIA is relatively new but presents an innovative approach to measuring the economic and employment effects of projects. This paper focuses on Rwanda and assesses the long term economic and employment outcomes the National Feeder Roads Programme (NFRP). Satellite data of night-time lights, presenting global light levels at night, was used as a proxy for economic activity in the form of GDP and translated into employment. GIS was further applied to measure how travel time to social infrastructure improved as a result of the rehabilitated roads programme. Results show that investments in roads produced an increase in GDP and employment at the local level, following completion of the project and that these effects continue to increase overtime. The largest impacts could be identified within 1km of the location of the new or improved roads. When summarising the impacts in GDP and employment by million Euro invested, the project produced similar increases in GDP and employment at the local level, when comparing to a previous study of a large transport corridor in Kenya, promoting the need for investment in rural feeder road programmes. The programme also increased physical accessibility to health and education infrastructure for the surrounding population. This analysis highlights the applicability of using innovative data sources to measure the economic and employment impacts of road investments in sub-Saharan Africa.

1. Introduction

The International Labour Organization (ILO) STRENGTHEN2 project aims to maximize employment impact assessment (EmpIA) in sub-Saharan Africa, for the creation of more and better jobs. STRENGTHEN2 is working to assess the employment impact of EU-funded infrastructure investments in Rwanda, among other countries. The National Feeder Roads Project (NFRP) was completed in 2016/17 and aimed to enhance access to markets in areas with high agricultural potential, through improving the road network. The objectives also included improving consumer access to safe and affordable food, economic and social services to improve food security and poverty reduction. The project was funded by the European Union (EU) and the Government of Rwanda (GoR), for a total of €40 million. This funded 700 km of rural roads rehabilitation and 500 km of rural roads maintenance in seven districts, including Nagoma, Bugesera, Huye, Muhanga, Ngororero, Rubavu, and Rulindo. The rehabilitated roads are presented in Figure 1. Upon completion of the programme, 799.5 km of rural feeder roads were constructed or re-paved and 514.27 km of rural feeder roads were extended and improved on the drainage system. This paper presents the EmpIA for the project, using geographic information systems (GIS) analysis and night-time lights (NTL) data to assess the long-term employment effects.

Once infrastructure projects are complete, it is important to assess their impacts on employment in order to understand the long-term effects that interventions have produced. Investments in roads increase long-term employment outcomes by enabling improved access to the labour market and other infrastructure, which assists the population in accessing more and better jobs. Operationalizing the use of GIS in EmpIA is relatively new, but there has been work done in utilizing geospatial data and satellite imagery for analysing the economic impacts of transport infrastructure. Much previous literature has shown the potential of NTL data as a proxy for economic activity, such as the work of Henderson, Storeygard and Weil (2012) at the country level in the form of GDP, along with another assessment on part of a transport corridor in Kenya that was also produced by the STRENGTHEN2 project (Game and Kang 2023). The high spatial and temporal resolution of the data makes it a valuable source, especially in areas where economic and employment data may be lacking from traditional sources. The use of NTL data for assessing the economic impacts of road projects has recently been applied in countries such as Haiti (Mitnik, Sanchez and Yañez-Pagans 2018) and the West Bank (BenYishay et al. 2018). This work aims to build upon the past literature to demonstrate the applicability of NTL data for assessing the economic impacts of road investments and works to translate these economic impacts to changes in employment. It further applies GIS by calculating improvements made in physical access to social infrastructure, focussing on schools and health facilities, for the benefitting population.

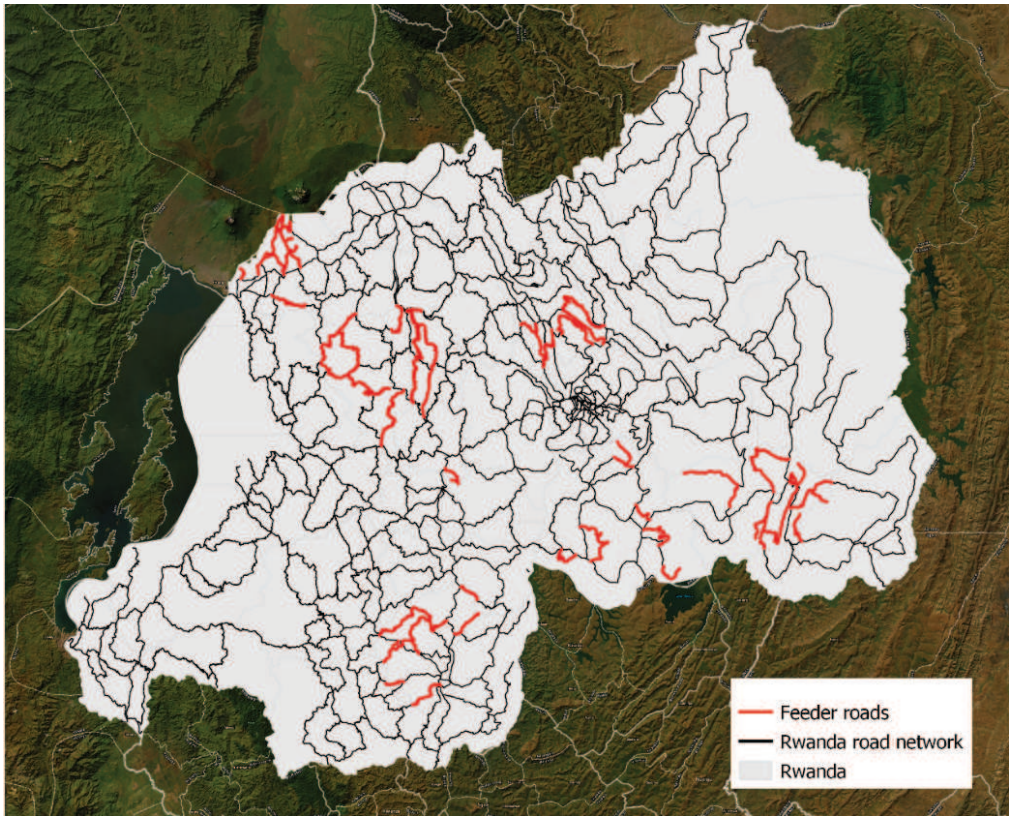

Figure 1: Rwanda road network and EU-funded feeder roads included in the NFRP

Source: MINAGRI 2018, OSM 2022, GADM 2012

2. Data

GIS and remotely sensed satellite data were downloaded, processed and combined to conduct the assessment into the economic, employment impacts and improvements in access to social infrastructure. The different data sources are outlined below.

2.1. Roads

The NFRP spreads across seven districts in Rwanda, which were used as the study area for the analysis. The feeder roads that were improved as part of the programme were applied as the treatment group. Feeder roads are considered to cover any road which links the agricultural areas with commercial centres or with a processing plant, often referred to as "Farm to Market Roads". The feeder roads standards provide the width of 6 m with the possibility to upgrade to 7 m for sections in National Roads and District Roads Class 1. The priority feeder roads identified by the project cover different categories of roads as per the Road Act: National, District Class 1, District Class 2 and unclassified roads. District class 1 and 2 roads that were not part of the roads rehabilitated under the project that fell within the seven districts, were used as the control or "untreated" group for comparison.

2.2. Night--time lights (NTL)

NTL data present light emissions at night and can be applied as a proxy for population, economic activity and electrification. Monthly NTL data from NASA's Visible Infrared Imaging Radiometer Suite (VIIRS) Day Night Band (DNB) instrument were used as the dependent variable of interest. Data were obtained from the beginning of 2012 to the end of 2020 at monthly intervals. NTL data values are presented as "radiance" or "brightness" values. These data were pre-processed to calibrate the data and account for seasonality.

2.3 . Night--time lights (NTL)

To control for other factors that could potentially influence the NTL brightness, a range of variables were included in the analysis that were created using additional GIS and satellite data. The Normalised Difference Vegetation Index (NDVI) provides a measure of vegetation greenness and can be used to identify changes in land use over time; this was obtained on an annual basis for the time period of focus (2012–20) from NASA's Moderate Resolution Imaging Spectroradiometer (MODIS) dataset. To control for population growth, annual gridded population estimates from Worldpop were also included, which provides a population count across the country at the approximate 100 m grid cell. Precipitation data from the Integrated Multi-satellite retrievals for GPM (IMERG) were obtained on a yearly basis at a resolution of approximately 10 km. Locations of conflicts during 2012–20 were obtained from the Armed Conflict Location and Event Data Project (ACLED) and filtered to include larger-scale conflicts such as explosions or riots, which could have influenced NTL brightness in target areas. Information on the presence of other infrastructure projects that were completed during the time period of focus and could have had an impact on the NTL brightness, were controlled for in the study.

For the accessibility to social infrastructure analysis, landcover data from the European Space Agency Climate Change Initiative (ESA CCI), Digital Elevation Model (DEM) from the Shuttle Radar and Topography Mission (SRTM) were used. Data on the locations of health facilities were obtained from the Esri Rwanda GeoPortal from the Ministry of Health and school locations from the Ministry of Education. Health facilities were subset to include main hospitals and health centres. Population data was again taken from Worldpop, however age and sex structures were utilized, to look at access to healthcare for women of childbearing age (WOCBA) between the ages of 15 and 49 and children between the ages of 1 and 9 for access to pre-primary/primary education and ages 10–19 for access to secondary education.

3. Methods

3.1. Econometrics

This analysis replicates the methodology applied in an assessment produced by STRENGTHEN2 in Kenya (Game and Kang 2023), which follows the methods outlined by Mitnik, Sanchez and Yañez-Pagans (2018), with their assessment of road projects in Haiti. The STRENGTHEN2 EmpIA of the Merille-Marsabit road project and wider Isiolo-Moyale transport corridor in Kenya (Game and Kang 2023), discovered that rehabilitated sections of road led to an increase in NTL between 11 per cent for one year after project completion, up to 22 per cent after four years. This translated to an increase in GDP between 4.6 to 9.6 per cent across the one to four years, respectively and an estimated 1.4 to 3 per cent increase in employment.

The analysis aims to use NTL data to assess the economic and employment impacts of the NFRP. It assesses the impacts of the road at both the administrative Level 4, the smallest administrative level where data was available for Rwanda, and at pixel level (approximately 450 m x 450 m resolution). The analysis focuses on how impacts vary over time, or years after treatment, and as distance from the road improvement increases.

Administrative units within 2.5 km distance from the road are used in the benchmark regressions and there is a total of 1211 such units in the study area that fall within this distance from both the treated and control roads. The pixel-level analysis was performed to investigate how impacts change across distance, where distances up to five kilometres from the roads were examined, with the end point of 5 km being selected based on the findings. The results of the impact on GDP and employment were derived from the administrative level analysis. Monthly NTL data was used in the analysis for the years 2012–20, providing a total of 108 monthly measures. For the administrative level analysis, NTL pixels that fell within each administrative unit were summed to get the total NTL brightness for each unit.

A difference in differences (DID) approach was applied to investigate the relationship between treatment (administrative areas that fell within 2.5 km of the road improvement) and NTL brightness. Starting from a reduced form specification, this was then built upon to include monthly, individual (administrative-level) fixed effects and the covariates of population, conflicts, NDVI and precipitation. Including administrative fixed effects addresses variation over time and both administrative and time-fixed effects address variations over time within administrative units. These different regressions were run for each year after completion, a span of four years, to understand when the largest effect could be identified. From this, a preferred specification was decided which was then used for the interpretation of final results and applied to the analysis at pixel-level, looking at how NTL varies as a result of changing the distance from the road.

The equation below presents the general econometric specification that was applied:

$$Y_{i,t} = \alpha + \beta_1 Treated_i + \beta_2 X_{it} + \beta_3 Z_{it-j} + \lambda_i + n_t + \epsilon_{i,t}$$

Where Y is the NTL brightness for the administrative unit or pixel, Treated i is the treatment variable that has a value of 1 for the month and year the area received a road improvement and 0 otherwise; λ_i is individual or administrative area fixed effects and n_t is monthly fixed effects; X_it is the control variables including population, precipitation, NDVI, conflicts and presence of other infrastructure projects; and Z_(it-j) presents lagged variables, where a lag of one year was tested, as per Mitnik, Sanchez and Yañez-Pagans (2018). Lags were on the basis of one year.

3.2. Translating NTL to GDP/employment

National level quarterly GDP data was sourced from the National Institute of Statistics of Rwanda (NISR) for the years of analysis. Quarterly employment data was also obtained from NISR on the number of people employed. The national level elasticity between the NTL brightness and GDP was computed, following the method of Henderson, Storeygard and Weil (2012). The translation to employment was then tested by calculating the national elasticity between GDP and employment.

3.3. Access to social infrastructure

To analyse the impact of the road project on access to social infrastructure, including health facilities and schools, travel time scenarios were simulated using the World Health Organization (WHO) AccessMod 5 (AccessMod, 2022). AccessMod is a software to measure physically accessibility to facilities, by combining and overlaying geospatial data and inputting travel information. Different travel speeds were set based on road class (primary, secondary, tertiary, feeder road) based on national speed limits and landcover type. Two scenarios were modelled for investigating access to health facilities and schools. The first scenario used the road network and travel speeds prior to the implementation of the feeder roads project, which assigned a travel speed of 20 km/h to feeder roads before being rehabilitated. This was based on information in the National Feeder Roads Policy and Strategy (2017), which states that roads with a poor "level of service", which takes into account travel speed, roughness and passability, where the original feeder roads would fall into this category, have speeds of less than 30km/h. An impact study of feeder roads in another district outside of this study (RTDA 2020) stated that the rehabilitation of feeder roads intends to improve the condition of the district network so it can ensure an average speed of 40 km/h. Therefore, this was selected as the speed for the second scenario, which modelled the travel time after the completion of the road project.

4. Results

4.1. Main results

The main results, using the preferred specification, are presented in Figure 2 for each of the four years after completion of the project. Table 1 presents the results of the regressions for three years after project completion, which was taken as the main result. Following the previous assessment in Kenya and the regressions of Mitnik, Sanchez and Yañez-Pagans (2018) and starting from the most reduced specification in column 1 in the tables, step by step, different elements were introduced into the models as outlined in each column in the tables. Administrative and time-fixed effects were first introduced, shown in columns 2 and 3, respectively. This was followed by variables for population, conflicts, NDVI, precipitation and other infrastructure projects, in column 4. Lagged covariates were the final component to be included, where a lag of one year was tested in column 5. When looking at the coefficients of the covariates, as Mitnik, Sanchez, and Yañez-Pagans (2018) did not include a clear justification for the inclusion of precipitation and NDVI, both raised issues of reverse causality, so they were excluded from the preferred specification. Due to this and the outcomes of these regressions, including from the previous EmpIA in Kenya, it was decided to include only population, conflicts and other infrastructure projects, with no lag, as these were most relevant with regard to the potential impact on the NTL data. Lagged data were not included in the preferred specification because similarly to Kenya, coefficient estimates from the lagged results did not conform to theoretical expectations. This was the model specification that was used for the pixel-level analysis.

As highlighted above, the final preferred specification, included only the current variables of population, conflicts and other infrastructure projects due to findings from the previous EmpIA in Kenya and the chosen specification in that study. This specification is presented in column 6 in the tables and the bar graph in figure 2. The coefficient for one year after treatment using this specification is 0.023, increasing up to 0.031 when looking at three years after treatment, before decreasing at four years after treatment to 0.022. When exponentiating the coefficient for interpretation of the results, using (exp(X) -1), this is equivalent to a 2.3 per cent increase in NTL brightness, one year after completion for administrative areas that received a rehabilitated road. This increases to 3 per cent two years after completion before peaking at 3.1 per cent three years after. The change then decreases following four years after completion of the project, where the increase in NTL is only 2.2 per cent.

Looking at the different years after treatment, the impact continues to increase over time, with the smallest effect being seen within four years after the completion of the project. This may be due to the effects of the COVID-19 pandemic, as four years after project completion corresponds with the year 2020/21 and is also in line with the national decrease in GDP growth that occurred during that year. An increase can be seen in three years after treatment, with a coefficient of 0.031 using our preferred specification, which equates to a 3.1 per cent increase in NTL brightness. It was decided to use three years after treatment as the main result as it does not vary greatly from the other years and still provides a relatively conservative estimate of the impact of road improvement on NTL, which was correspondingly the basis of our estimates of GDP and employment elasticities. employment elasticities.

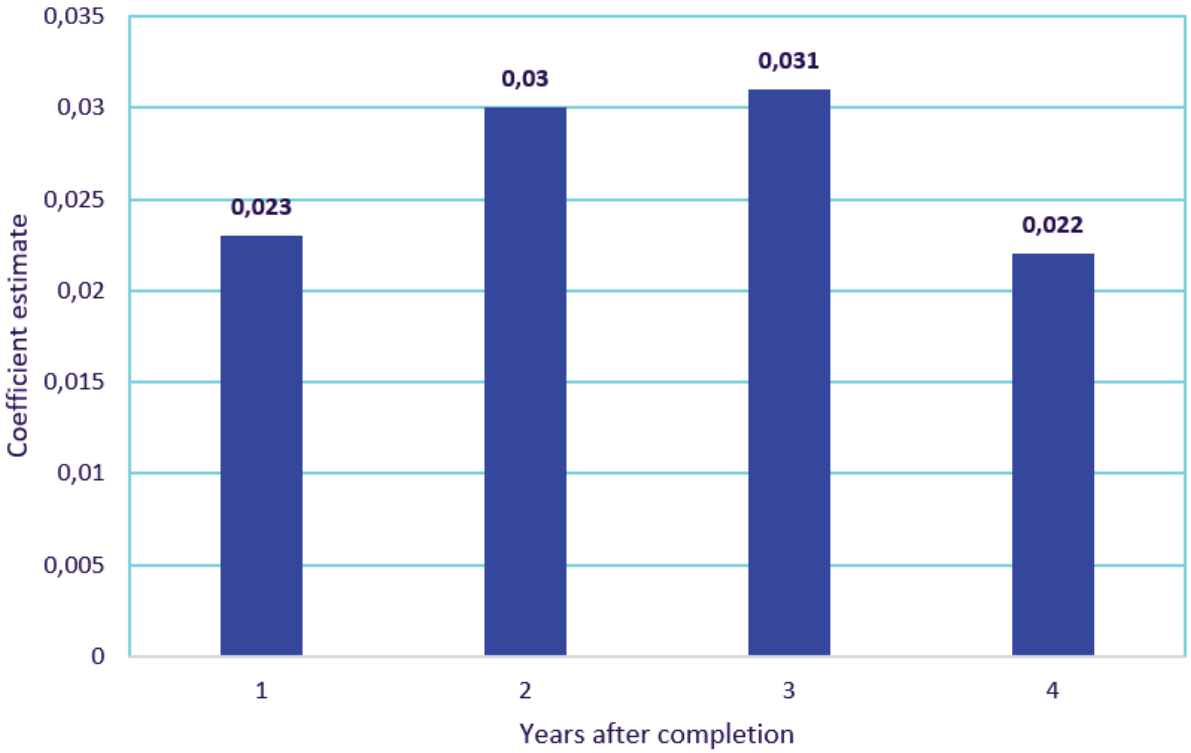

Figure 2: Coefficient estimates for years after completion of the road project

Table 1: Administrative level treatment effect, three years after project completion

	NTL luminosity					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.049***	0.100***	-0.028***	0.052***	0.061***	0.031***
	(0.009)	(0.007)	(0.009)	(0.007)	(0.007)	(0.007)
Observations	101,472	101,472	101,472	101,472	86,976	101,472
Adjusted R-squared	0.000	0.700	0.704	0.825	0.836	0.798
Admin area FE	NO	YES	YES	YES	YES	YES
Time FE	NO	NO	YES	YES	YES	YES
Covariates	NO	NO	NO	YES	YES	YES

4.2. Pixel level results

The analysis was also conducted at the pixel level to investigate how impacts on NTL vary based on distance from the road project. Understanding if the effects are concentrated around the road improvements is important from a planning and policy perspective, for the targeting of future investments.

To test for heterogeneity in results and explore how effects vary across distance from the road, the buffer outside the road was changed using increments of 1 km up to a distance of 5km away. Table 2 outlines the results, where the largest impact can be seen closest to the road, at 0–1 km distance, with an impact of 1.1 per cent; this decreases but remains statistically significant at 1–2 km away from the road, with a 0.4 per cent increase in lights, when exponentiating the coefficient for interpretation as per the formula above. Between 2 to 3 km from the roads there is an increase of 0.7 per cent, but after this, the sign changes and the effect becomes negative and loses statistical significance, although it is very small. This may suggest that after a 3 km distance, effects drop off or that there is even a slight decline in NTL in areas with a road improvement after this distance. This effect remains small but becomes positive and statistically significant for a distance of between 4 to 5 km from the road.

Table 2: Impact on NTL luminosity following road improvement, at the pixel level, changing the distance from the road

	NTL luminosity				
	1 km	2 km	3 km	4 km	5 km
treatment	0.011***	0.004***	0.007***	-0.001	0.003***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Observations	1,554,284	840,715	496,903	474,096	359,520
Adjusted R-squared	0.883	0.932	0.965	0.958	0.914

To more fully understand the economic and employment impacts of road investments, it is instructive to express changes in NTL in terms of changes in GDP and then employment. As mentioned, previous EmpIA and literature has demonstrated the applicability of NTL as a proxy for economic activity in the form of GDP. National level GDP data was available on a quarterly basis for Rwanda, which was used to establish the relationship between GDP and NTL.

The main results are presented in table 3, which presents the elasticity between GDP and NTL, using the quarterly GDP data for the years that coincide with NTL data (2012–2020). The elasticity is 0.347, which is slightly lower than the elasticity obtained from the EmpIA in Kenya of 0.424 but still in line with Henderson, Storeygard and Weil (2012), who estimated an elasticity of around 0.3 for a group of low- and middle-income countries. Assuming that this elasticity holds at the administrative level 4, this suggests an estimated 0.8 per cent increase in GDP one year after completion of the project, increasing to a 1.1 per cent increase in GDP in both two and three years after. Four years after completion saw an increase in GDP of 0.8 per cent in areas that received a rehabilitated road.

Table 3: Elasticity between annual GDP and NTL luminosity, at national level

	lnGDP
lnNTL	0.347**
	(0.149)
Observations	40
R^2	0.124
Note:	*p<0.1; **p<0.05; ***p<0.01

4.3. Translating into employment

Using quarterly employment data from Labour Force Surveys (LFS) conducted by NISR that is available back to 2016 on the number of persons employed per year, the relationship between GDP and employment is presented in Table 4. The log difference was used to investigate the elasticity between GDP and employment. It should be noted that as the data on employment is available only from 2016, which results in a limited number of observations for the regressions. The coefficient is 0.38, which is in line with the previous EmpIA conducted in Kenya (Game and Kang 2023), which produced an elasticity of 0.34, and which is in line with previous work that studied the relationship at the provincial level in China (Charpe 2022). Taking the lights/GDP elasticity of 0.34 and this coefficient of 0.38 produces a combined coefficient of 0.13. From this indirect approach of calculating the NTL/GDP and GDP/employment elasticities, it is estimated that the areas that benefitted from the project resulted in an estimated 0.4 per cent increase in employment compared to locations that did not receive a rehabilitated road. This is based on three years after completion. Following one year after project completion, the increase in employment is 0.3 per cent.

When comparing this result to the EmpIA of the Merille-Marsabit road in Kenya (Game and Kang 2023), which produced an estimated increase in employment between 1.7 and 3 per cent, this result is much lower. However, this is to be expected, as the road in Kenya was a main road that was part of a transport corridor. The NFRP focusses in rural locations and aims to connect agricultural areas to markets, so it is arguable that rather than an increase in employment and the number of jobs created, larger changes may be found in incomes of workers. It will be necessary to further examine this with additional LFS data to accurately assess these changes.

Table 4: Relationship between annual employment and GDP

	lnEmp
lnGDP	0.384**
	(0.083)
Observations	18
R^2	0.571
Note:	*p<0.1; **p<0.05; ***p<0.01

4.4. Access to social infrastructure

Looking at the impacts of the NFRP on geographic accessibility to social infrastructure, which improves access to social services for the benefitting population, it was discovered that in all seven districts, the access to schools and health facilities improved due to the rehabilitated feeder roads.

When investigating access to health facilities and assessing coverage for women between the ages of 15 to 49, as an indicator for access to maternal healthcare, Figure 3 outlines the percentage of women covered before and after the rehabilitated roads separated by district, up to a travel time of 30 minutes to the nearest health facility. It shows the travel time for both scenarios, (Pre) – before the road rehabilitation project and (Post) – after the project has been completed. Ngoma district saw the largest increase, where the rehabilitated roads increased coverage to health facility from 65 to 77 per cent, within a 15-minute travel time. When looking at up to 30 minutes, 89 per cent of the population are now within walking and driving distance to a health facility, compared to the 78 per cent before the project. On average, there was an 8 per cent increase in population within 15 minutes to a health facility across all districts and a 6 per cent increase for within 30 minutes, as a result of the improved feeder road scenario.

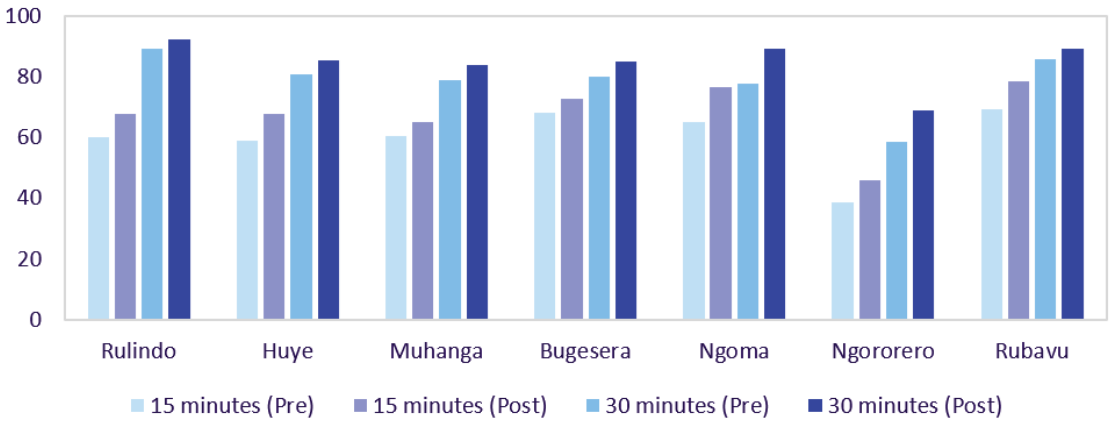

Figure 3: Percentage of women within 15 and 30 minutes from the nearest health facility, pre and post completion of the project

Figure 4 displays the results for the changes in travel time pre and post the rehabilitated roads, for children's access to the nearest primary school. The average travel time for 15 minutes to the nearest primary school increased from 65 per cent before the project, to 71 per cent after project completion. For secondary schools, the coverage was slightly lower but still increased from 63 per cent to 69 per cent. The school-age population within 30 minutes travel time increased by 3 per cent after completion of the project for both primary and secondary schools.

Although for both schools and health facilities, there were increases in coverage following the rehabilitation of the feeder roads, this analysis also highlights districts that still have decreased coverage compared to others. For example, Ngorero district has a lower coverage, where 69 per cent of women are within 30 minutes travel time to a health facility, even following the completed road project. This highlights potential areas for targeting future interventions to increase population access to these essential services.

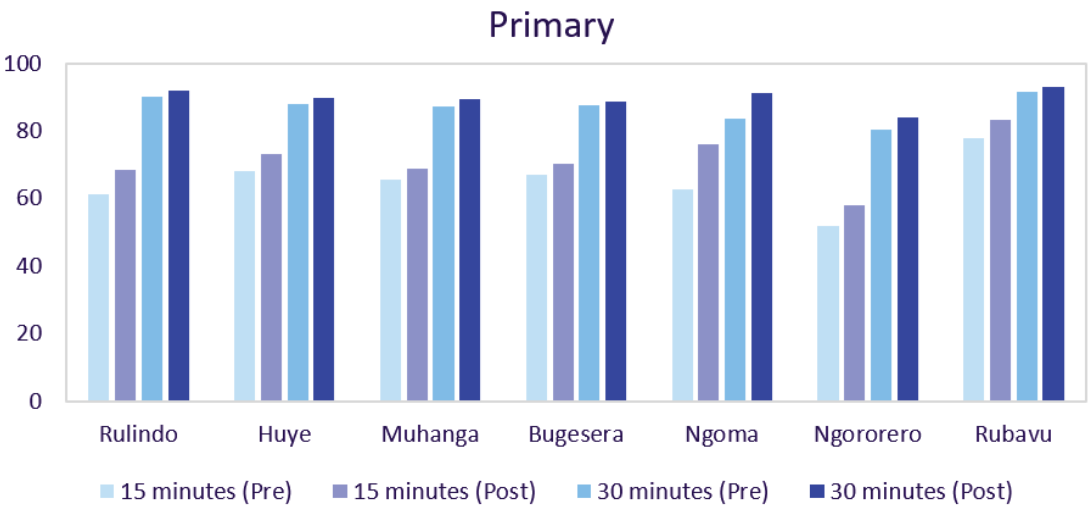

Figure 4: Percentage of school-age children within 15 and 30 minutes from the nearest primary school, pre and post completion of the project

5. Conclusions

The NFRP in Rwanda has provided an increase in economic activity and employment to areas receiving a rehabilitated road as part of the project. This work builds upon previous literature that studies the impacts from roads using NTL data. This assessment provides a valuable comparison where it focusses on a specific type of road project, feeder roads, and further develops an innovative approach to measuring long-term employment effects.

The results highlight an increase in economic activity in the form of GDP and employment due to the project. Results show that the project produced an estimated increase in NTL brightness between 2.3–3.1 per cent at the administrative level, from one to three years after the project was completed. The highest impact, 3.1 per cent, could be observed three years after completion, with a slightly lower but still positive effect after four years, of 2.2 per cent, which could be due to the effects of the COVID-19 pandemic. Taking the preferred result of three years after completion and the elasticity between lights and GDP, it is estimated that the administrative areas around the rehabilitated roads saw a 0.8 per cent increase in GDP compared to those that did not receive a road improvement. The pixel-level analysis highlights impacts that are concentrated within 1 km of the road project, where beyond this the impact appears to be negligible. Based on this, it is recommended that future road planning should be located around 1km of target populations to ensure they benefit. This finding is in line with the previous assessment in Kenya and other literature. When translating this increase in GDP to employment, using the indirect method of measuring the relationship between GDP and employment, it is estimated that the project produced a 0.4 per cent increase in employment three years after completion.

When presenting the results in terms of million Euro invested and km of road built, based on the project cost of 40 Euro million, GDP is estimated to have increased by 0.04 per cent per million Euro invested, using the maximum increase of four years after completion of the project. For employment, this equates to an increase of 0.01 per cent per million Euro invested. When looking at the results per 100 km of road constructed or rehabilitated, based on the total of 700 km of roads rehabilitated, this is equivalent to an increase in GDP of 0.2 per cent and an increase in employment of 0.06 per cent, per 100km of road.

When comparing to the EmpIA of the Merille-Marsabit road project in Kenya that follows the same analysis, the economic and employment effects of the NFRP are lower. This could be due to the rural nature of the project, compared to the road in Kenya that was larger and formed part of a transport corridor. The NFRP project focusses on improving accessibility between agricultural areas and markets, so may not attract a large amount of new economic activity and employment to areas benefitting from the rehabilitated roads. Rather, people working in agriculture in areas targeted by the project may experience changes in employment quality, through things such as increased incomes due to better access to markets to sell produce or a shift may occur from existing subsistence farming to employment in agriculture. Although it is not possible to examine this dimension using the night-time lights data, it is recommended to further analyse the employment impacts of feeder road projects, with the inclusion of LFS data with geographic information. This would allow access to additional variables on employment and it will be interesting to study how these outcomes change as a result of feeder road rehabilitation.

However, when looking at the results per million Euro invested across the two studies, the results are similar and achieve the same amount of employment increase, at 0.01 per cent per million Euro, at 0.04 per cent compared to the 0.03 per cent increase in Kenya. This promotes the need to continue to invest in smaller roads in rural areas, as it is estimated that they generate a similar amount of GDP and employment at the local level. Based on the results per 100 km of roads constructed or rehabilitated, the feeder roads project in Rwanda is lower, with an increase in GDP per 100 km of road of 0.2 per cent, vs 1.92 per cent in Kenya. For employment, the feeder roads achieve an increase of 0.06 per cent per 100 km of road, compared to 0.6 per cent in Kenya.

Aside from the employment impacts, the project has also increased access to social infrastructure, which is important for improving physical access to social infrastructure for workers among the population and overall poverty reduction. On average, the NFRP increased access to maternal healthcare, within a 15-minute combined walking and driving travel time for 8 per cent of women and for 6 per cent within a 30-minute timeframe. When assessing education across the districts, 71 per cent of school-age children are within a 15-minute walk and drive from primary schools, compared to 65 per cent before the completion of the project. A 6 per cent increase was observed for access to secondary education. Although this demonstrates the improvements the project has produced in terms of physical accessibility, there are still clear gaps in access in some districts that are recommended to be addressed through further intervention. To expand this analysis further, other modes of transport, such as bicycle and motorcycle could be assessed, which are widely used in Rwanda for transport. The results from this analysis provide a valuable indication to coverage of health and education in these rural areas and should be taken into account for future policy setting and decision-making.

Overall, as there are only a few specific previous examples of this work being applied to transport investments, it is recommended that this analysis be replicated in different settings to further explore the potential of harnessing these data to measure the impacts of infrastructure projects. This includes the addition of LFS data to further examine the impacts of such interventions related to employment quality. Streamlining the methods and highlighting the applicability of the data further will encourage the workflow to be operationalized within institutions to measure the long-term impacts of their investments.

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Notes

Aligning Procurement Policy for Rural Road Infrastructure Projects in India with Decent Work Elements of ILO

D. P. Gupta and Tomas Stenstrom

04

Aligning Procurement Policy for Rural Road Infrastructure Projects in India with Decent Work Elements of ILO

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Mr D.P. Gupta did his B.Sc. In Civil Engineering from Punjab University in 1956 with Honours and stood first in the University. Was awarded Gold Medal. He did his Masters in Transportation Engineering from Ohio State University USA in 1976 with A Grade in all subjects. After a brief stint in the Central Water and Power Commission in central Government and Punjab PWD he joined the Ministry of Road Transport and Highways in 1959 and retired as DGRD & Additional Secretary, MORTH in 1994. An active member of IRC, he served as Chairman Rural Roads Committee and other committees. He is also Member Highway Research Board. He has been Guest faculty to IAHE and other academic institutions. He was also Chairman of the CRRI Research Council for three years 2001-2003. After retirement, he served as part time Consultant to ADB, UN ESCAP, World Bank and UN-ILO. Currently, he is associated with the Asian Institute of Transport Development. D.P. is associated with the PMGSY since its launch in December 2000. He was a Group leader for preparing the Rural Road Development Plan: Vision 2025. He is chairing the Technical Committee of National Rural Infrastructure Development Agency of the Ministry of Rural Development. He served as Guest Faculty in the years 2013, 2014, 2015 taking Courses in PPP and Rural Roads for students undertaking M.Tech in Highway and Safety Engineering from DCRUST, Murthal, Government of Haryana. He served as Member on Sunder Committee on Road Safety 2005-2007 set up by the MORTH and on National Transport Development Policy Committee of the Planning Commission 2010-2014.

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CONTENTS

1. Introduction

As India launched the era of planned development, she had a reasonably good railway network, a few ports and about 400,000 km of serviceable road network. Accessibility to villages was poor as only 20 percent of them had all-weather road links. A major thrust for the development of rural roads was given in 1974 when it was made a part of Minimum Needs Program (MNP). The MNP covered drinking water, housing, assured irrigation, telephone communications, electricity and connectivity to villages by all -weather rural roads. The road network now stands at around 5 million km. Of this nearly 4.4 million km comprise of rural roads. At the time of the launch of the PMGSY program (in 2000) the village accessibility stood at 54 percent [1].

2. Rural roads as poverty reducer

There is enough empirical evidence that rural roads act as an entry point for poverty alleviation. A study by the International Food Policy Research Institute has revealed that an investment of INR 10 million in roads lifts 1650 persons above the poverty line [2]. The policy and decision makers in the country recognized that Rural Roads act as facilitators to promote and sustain agricultural growth, improve basic health, provide access to schools and economic opportunities. Thus, they hold the key to accelerated poverty reduction, socio-economic transformation, national integration and breaking the isolation of village communities and enable holistic rural development.

3. PMGSY - A flagship program

A boost was given to given to rural connectivity with launch of Rural Roads Program known as Pradhan Mantri Sadak Yojana (PMGSY) – a Prime Minister's Village Road Scheme (http://omms.nic.in/). As a departure from earlier programs, the PMGSY is being implemented on cost sharing basis between the Government of India and State Governments. To mobilize resources, the Centra Road Fund was revamped with levy of INR 1.00 per liter of High Speed Diesel in 1998.

4. Achievements under PMGSY

The PMGSY covers connectivity to all habitations above population 500 in plain terrain and above population 250 in Special category states in NE States, Sikkim. Himachal Pradesh, Uttarakhand and Jammu & Kashmir [3]. An overall program of connecting around 180,000 habitations covering about 350,000km of new roads and another 380,000 km of Upgradation was envisaged. By now, the connectivity with new construction is by and large achieved. An investment of about Rs 2.7 trillion (equivalent of US Dollars 36 billion) has been made since the year 2000 under this Flagship Program of India.

5. Outcomes of the rural connectivity

The program has been highly successful – savings in travel time, generating economic opportunities for the rural masses, diversification in agricultural sector, human capital accumulation, etc.

These are broadly as mentioned below:

- The connected habitations reported a marked reduction in travel time with an average reduction of approximately six minutes for every kilometre travelled.
- Improved farm-to-market connectivity and enabled farmers to travel farther to locations with better crop prices.
- Impact evaluation of the program carried out in 4 states between 2009 and 2017 revealed the farmers also travelled an additional 8.9 km to sell their crops for higher returns – representing 88% increase in distance travelled.
- Recent studies suggest that road connectivity, especially in remote villages, enabled farmers to diversify the cropping pattern. Studies conducted by ILO in 2015 in Bihar, Jharkhand, Rajasthan, and Uttar Pradesh also indicated a shift in cropping patterns to fruits and vegetables accompanied by higher adoption of fertilizers and seeds.
- New roads helped increase availability of public bus services by 12.8% with a similar impact noted in availability of auto-rickshaws.
- Improved road connectivity enabled villagers to travel and opt for non-farm-based employments elsewhere. In 2009, around 36% people in unconnected habitations reported non-farm activities as their primary occupation. The number increased to 48% by 2019 post PMGSY connectivity as per this impact survey.
- States like Himachal Pradesh, Madhya Pradesh, Mizoram, Tamil Nadu, and Uttar Pradesh have shown a distinct increase in non-farm activities like new shops and cottage industries as a result of better access to the market.
- Primary employment outside the villages reported an increase of 8%.
- The impact studies highlighted a 9% increase in the likelihood of women working as a result of better rural connectivity – probably due to men shifting to non-farm jobs outside villages and women stepping in to fill in the pool of farm jobs at village levels.
- An increase of 5.5% in employment rate (as per World Bank's Impact evaluation of the program) due to the entry of women workforce was among the key factors.
- Studies suggest that PMGSY roads helped high/middle school children have additional 0.7 additional years, or 9% increase, of schooling. Also gender parity was observed in program's adoption with regards to schooling patterns.
- The percentage of childbirth at home had a 30% reduction in connected habitation. The decline was higher in habitations that were far from urban areas indicating the positive impact of accessibility in remote areas.

6. Current focus

Now, the focus is on:

- Upgradation of existing roads.
- Connectivity to lower size habitations outside the PMGSY.
- Regular maintenance of rural roads to ensure sustainability of benefits arising from road connectivity.

7. Maintenance and safety

Side by side, emphasis has been given to maintenance of rural roads for providing sustainable benefits from these development programs. It does not require any stress to assert that maintenance also helps in higher safety of road users. At the very launch of PMGSY Program, a 5-Year Maintenance Period along with Defects Liability Period was a part of initial construction contracts.

8. Role of Government

The Ministry of Rural Development (MORD) in the Government of India has the responsibility for policy and planning of rural roads while implementation is taken care of by the respective State Governments. The MORD has established an agency called National Road Infrastructure Development Agency for exercising oversight and providing technical and management support to the entire program during implementation.

9. Promoting light equipment

As regards construction technology, it was decided by the policy makers to introduce light equipment (low end and low cost). Equipment Industry were requested to also focus on production of pedestrian road rollers, chip sealing machines, simple equipment for splaying emulsion. Moreover, this program seeks to integrate development objective with employment objective while contributing to creation of durable infrastructure.

10. Aligning with decent work elements of UN ILO

An employment of 800 million man-days per year is reckoned as a broad estimate for regular maintenance of the rural road network and construction including upgradation of existing roads. A majority of this would be in the informal sector. Obviously, this would call for attention to aspects like occupational health and safety, safety of workers, social protection and security and timely payment of wages. Being a member country of the UN, the Guidelines and Acts on labour related aspects by the Ministry of Labour and Employment, Government of India incorporate various objectives and DECENT WORK elements of the ILO viz. promotion of rights at work, employment, social protection and social dialogue.

11. The standard bidding document

The Standard Bidding Document (SBD) [4] for rural roads stipulate strict adherence for such requirements by the contractor in construction contracts. The stipulations in the SBD in so far as Labour Regulations and Safety are concerned, are briefly captured in Box 1 below.

Box 1: Safety and Labour Regulations

Box 1: Safety and Labour Regulations

A: Safety

1. Contractor shall be responsible for all safety activities at site.
2. He will also be responsible for safety of all persons on works engaged directly or otherwise and in cases of accidents, he shall pay as per Workmen's Compensation Act,1923.

B: Labour Regulations

1. Contractor shall make his own arrangements for Labour and be responsible for their safety, payment, housing, feeding and transport.
2. He will submit to the Engineer, a return indicating the number of labour in each class engaged on the site.
3. He will abide by all labour laws and regulations and rules made there under. Some of the major labour laws are given in APPENDIX-1 to GCC.
4. He will pay Minimum Wages and observe conditions no less favorable than established for the trade.
5. In cases of Payment default to Labour Authorities, the Engineer shall make the payment and recover the same from the contractor as sum due.
6. Contractor shall be responsible for Employees' State Insurance (ESI) for the labour engaged.
7. He will comply with Child Labour (Prohibition and Regulation) Act, 1986.
8. He will not have any gender bias and comply with Equal Remuneration Act 1979 and Maturity Benefit Act 1961.
9. He will comply with Construction Workers (Regulation and Employment & Conditions of Service) Act 1996 and Cess Act, 1996. and pay to the state department of labour one percent of the project cost for welfare purposes of the labour and he can build this cost in his prices for various items of the work.
10. He will provide all necessary accommodation and welfare facilities as per prevailing labour regulations?
11. He will submit compliance report of adherence to labour regulations as directed by the Engineer.

As brought out in this Box, some of the major labour laws and regulations are given in APPENDIX to Part I General Conditions of Contract and can be seen in ANNEX-1 to this paper. It would be observed that the SBD for Rural Roads has amply aligned the various elements of ILO DECENT WORK agenda.

References

[1] RURAL ROAD DEVELOPMENT PLAN: VISION 2025: Issued by Ministry of Rural Development, Government of India, May 2007.

[2] Fan, Hazell and Thorat,1999-International Food Policy Research Institute: Study on poverty reduction and growth in Total Factor Productivity due to investment in roads in India.

[3] Rural Roads Manual: IRC SP20.

[4] STANDARD BIDDING DOCUMENT FOR RURAL ROADS, issued in June 2020 by the NRIDA MORD.

Appendix to Part I General conditions of contract

SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK.

(a) **Workmen Compensation Act 1923**: - The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

(b) **Payment of Gratuity Act 1972**: - Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed the prescribed minimum years (say, five years) of service or more or on death the rate of prescribed minimum days'(say, 15 days) wages for every completed year of service. The Act is applicable to all establishments employing the prescribed minimum number (say, 10) or more employees.

(c) **Employees P.F. and Miscellaneous Provision Act 1952**: The Act Provides for monthly contributions by the Employer plus workers at the rate prescribed (say, 10% or 8.33%). The benefits payable under the Act are:

1. (i) Pension or family pension on retirement or death as the case may be.
2. (ii) Deposit linked insurance on the death in harness of the worker.
3. (iii) Payment of P.F. accumulation on retirement/death etc.

(d) **Maternity Benefit Act 1961**: - The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

(e) **Contract Labour (Regulation & Abolition) Act 1970**: - The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by Law. The Principal Employer is required to take Certificate of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ prescribed minimum (say 20) or more contract labour.

(f) **Minimum Wages Act 1948**: - The Employer is to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of buildings, roads, runways are scheduled employment.

(g) **Payment of Wages Act 1936**: - It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

(h) **Equal Remuneration Act 1979**: - The Act provides for payment of equal wages for work of equal nature to male and female workers and for not making discrimination against female employees in the matters of transfers, training and promotions etc.

(i) **Payment of Bonus Act 1965**: - The Act is applicable to all establishments employing prescribed minimum (say, 20) or more workmen. The Act provides for payments of annual bonus within the prescribed range of percentage of wages to employees drawing up to the prescribed amount of wages, calculated in the prescribed manner. The Act does not apply to certain establishments. The newly set- up establishments are exempted for five years in certain circumstances. States may have different number of employment size.

(j) **Industrial Disputes Act 1947**: - The Act lays down the machinery and procedure for resolution of industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

(k) **Industrial Employment (Standing Orders) Act 1946**: - It is applicable to all establishments employing prescribed minimum (say, 100, or 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get these certified by the designated Authority.

(l) **Trade Unions Act 1926**: - The Act lays down the procedure for registration of trade unions of workmen and Employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.

(m) **Child Labour (Prohibition & Regulation) Act 1986**: - The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulations of employment of children in all other occupations and processes. Employment of child labour is prohibited in building and construction industry.

(n) **Inter-State Migrant Workmen's (Regulation of Employment & Conditions of Service) Act 1979**: - The Act is applicable to an establishment which employs prescribed minimum (say, five) or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as Housing, Medical-Aid, Travelling expenses from home up to the establishment and back etc.

(o) **The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996**: - All the establishments who carry on any building or other construction work and employs the prescribed minimum (say, 10) or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be notified by the Government. The Employer of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodations for workers near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

(p) **Factories Act 1948:** - The Act lays down the procedure for approval of plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing the prescribed minimum (say, 10) persons or more with aid of power or another prescribed minimum (say, 20) or more persons without the aid of power engaged in manufacturing process.

Le Digital au Service de Planification des Programmes d'Investissements: Cas des Communes Tunisiennes

Riadh Safi and Sonia Sliti

05

Le Digital au Service de Planification des Programmes d'Investissements: Cas des Communes Tunisiennes

Riadh Safi
Sonia Sliti

Sous-theme: Innovation en matière de technologie d'approche et de méthodologie pour la réalisation des projets d'infrastructure rurale et urbaine

About the authors

Doctorant chercheur en sociologie et titulaire d'un diplôme d'ingénieur en statistique et analyse de l'information, Monsieur Riadh SAFI occupe actuellement le poste de Coordinateur National/ Ingénieur économiste statisticien à l'Organisation Internationale du Travail (OIT) en Tunisie à travers le projet Initiative Pilote pour un Développement Local Intégré (IPDLI).

Avec plus de vingt ans d'expérience professionnelle, à des niveaux de responsabilité de plus en plus élevés, en Tunisie comme ailleurs, Monsieur Safi a eu l'opportunité de mettre en place plusieurs systèmes d'information et d'aide à la décision, dans les secteurs public/ privé, et de suivre & d'évaluer la performance de mise en œuvre de projets dans de divers domaines (social, économie, agriculture, infrastructure, ...).

Soucieux de libérer le talent humain créatif innovatif, Monsieur Safi a enrichi son savoir-faire dans plusieurs créneaux à haut potentiel en matière de Recherche et Développement via la réalisation de diverses enquêtes/ études terrain et l'élaboration de rapports spécifiques.

A travers son expérience à l'OIT, Monsieur Safi a œuvré pour valoriser l'adoption de l'approche HIMO, en particulier dans le secteur du bâtiment et des travaux publics (BTP), pour démontrer à la fois la capacité de cette démarche à créer des emplois décents, et l'impact du recours aux ressources humaines/naturelles locales dans l'amélioration les conditions de vie des populations.

Mme Sonia SlLITI est une experte expérimentée avec plus de 20 ans dans la conception et mise en œuvre des stratégies de développement participatif particulièrement dans l'élaboration des plans de développement locaux. Mme Sliti possède une expérience pluriannuelle dans le domaine de la coopération pour le développement, la décentralisation et le développement local en Tunisie avec un accent sur la planification locale et la gouvernance participative.

Mme Sliti est à présent une experte nationale reconnue en Tunisie dans l'accompagnement à la conception et mise en œuvre des plans de développement local, le pilotage et monitoring du processus d'appuis aux collectivités locales dans l'élaboration de leurs PDL, en ayant travaillé avec de projets de coopération de grandes clés d'envergure comme PACT; Madinatouna II; ADEC; IPDLI dans le contexte du développement locale intégré.

Ingénierie, mise en œuvre, pilotage et monitoring du processus d'appuis aux 100 Communes dans l'élaboration de leurs Plans de développement locaux appui aux 90 Communes dans l'élaboration de leurs programmes d'investissement communaux : Conception de l'approche, élaboration des supports et guides, sélection, formation et évaluation des experts, coordination et pilotage technique du processus et travaux de terrain, révision et validation des livrables.

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CONTENTS

Resume

L'élaboration des documents de planification et des programmes d'investissements passe par un processus délicat et long afin d'identifier les besoins, de fixer les objectifs et les priorités, d'élaborer un plan d'action pour pourvoir par la suite le mettre en œuvre. Tout ce processus est accompagné par un système de suivi et d'évaluation.

Etant un document global et inclusif pour la commune, le Plan de Développement Local (PDL) doit garantir la participation réelle de tous les acteurs locaux (y compris les individus) et la prise en considération de toutes les dimensions de développement notamment la dimension spatiale, économique, sociale, etc.

Le recours à la digitalisation et aux Nouvelles Technologies d'Information et de Communication (NTIC) a contribué à instaurer une approche à la fois innovante et scientifique pour l'identification et la planification des projets de développement. D'ailleurs, l'usage des NTIC est indispensable dès la phase préparatoire du PDL, passant par les phases de diagnostic territorial et d'identification, voire de priorisation des projets de développement, jusqu'à la phase de promotion et de recherche de fonds pour la mise en œuvre des projets.

En effet et pour lancer les activités préparatoires pour l'élaboration du PDL, la commune fait recours généralement aux canaux digitaux pour informer et mobiliser des acteurs locaux et des habitants. Les réseaux sociaux jouent un rôle primordial pour la communication avec le grand public que ce soit pour les informer sur les différentes activités relatives à la préparation du PDL, ou pour être à l'écoute de leurs attentes, leurs avis, leurs priorités et, voir même, leurs feedbacks. Ces réseaux permettent de couvrir et de cibler la population dans les diverses zones de la commune et d'impliquer les différentes catégories concernées.

Par ailleurs, les NTIC ont permis aussi de perfectionner le diagnostic territorial relatif aux besoins et aux attentes des habitants des communes, et d'instaurer des bases de données informationnelles sur le profilage des citoyens et leurs conditions de vie. Plusieurs outils innovants ont été conçus pour dresser ce diagnostic : digitalisation d'une enquête ménage sur les principaux aspects sociaux-économiques de la population, géolocalisation des structures institutionnelles et économiques sur le territoire communal via la mise en place d'un système de cartographique, transposition des principaux indicateurs sur des cartes thématiques via des systèmes d'information géographiques (SIG) permettant de superposer plusieurs couches de données territoriales en vue de comprendre les spécificités du territoire, etc. L'utilisation des technologies en matière du diagnostic permet d'améliorer et accélérer la qualité des analyses quantitatives et qualitatives.

La conception et la programmation d'outils d'aide à la décision pour la priorisation et l'identification des projets de développement à mettre en œuvre par la commune a permis de garantir la transparence, l'objectivité et le respect des règles de priorisation concertées avec les acteurs locaux et en réponse à leurs attentes. La déclinaison du PDL vers un programme d'investissement local (PIL) est une étape cruciale pour passer à la phase de mise en œuvre et de concrétisation sur terrain des projets.

L'estimation budgétaire du PIL est assurée par un outil de modélisation permettant de faire le matching avec un référentiel standardisé. Par ailleurs, une plateforme digitale regroupant les projets à la recherche de financement, est mise à la disposition des communes et des bailleurs de fonds pour assurer la levée de fonds des projets proposés.

1. Contexte general: Processus de la decentralisation en Tunisie

La décentralisation est un processus qui implique la participation des populations et des communautés dans la gestion de leurs propres affaires. En effet, elle donne la possibilité aux communautés d'assurer leur développement à travers des responsables élues. La décentralisation positionne la démocratie à la base de l'émergence des acteurs locaux, la responsabilisation des populations et la bonne gouvernance. Elle traduit également le développement local par la mobilisation des acteurs locaux autour de projets économiques et socioculturels, la valorisation des ressources naturelles et des savoirs faire locaux, et l'accroissement des ressources financières.

En Tunisie et avant la constitution 2014, malgré la mise en place d'un cadre juridique (notamment la loi organique des collectivités locales en 1975 et la loi organique des conseils régionaux en 1989), la mobilisation de moyens humains et financiers et la mise en œuvre de multiples programmes de développement au niveau local, la décentralisation s'est marquée par:

- Faible pertinence et efficacité limitée des interventions des collectivités locales
- Faible autonomie juridique et financière des collectivités locales
- Hégémonie du formalisme et des techniques administratives bureaucratiques
- Faible adhésion de la population et absence d'instruments de la démocratie participative
- Confusions entre déconcentration et décentralisation.
- Contrôle centralisé
- Moyens humains et financiers limités

Il était nécessaire d'engager une réforme profonde du mode de gestion et de gouvernance des affaires locales. Plusieurs avancées ont permis de réorganiser le pouvoir local. En outre, dans le passé, plus de 50% du territoire était 'non-municipalisé', de sorte que plus d'un tiers de la population vivait en dehors des zones municipales et ne pouvait donc pas élire de responsables locaux (1). Le territoire tunisien a fait l'objet d'une communalisation, impliquant la création de 86 nouvelles communes et 187 communes étendues. Cette communalisation de l'ensemble du territoire a permis une couverture globale de tous les habitants par le régime municipal : 350 communes quadrillent désormais le territoire, contre 264 en 2013.

La communalisation du territoire national visait à (i) inclure la population rurale dans l'espace communale et assurer une couverture spatiale totale du système communal sur le territoire national; (ii) Favoriser l'égalité des droits civiques, économiques et sociaux entre les citoyens ; (iii) Favoriser la création de zones municipales favorables à la prestation des services municipaux et à la gouvernance locale démocratique décentralisée ; (iv) Promouvoir le développement économique local ; (v) Assurer une répartition équitable sur la base des principes constitutionnels de péréquation et de discrimination positive.

L'examen analytique de la situation des communes tunisiennes révèle trois importants challenges:

- Déséquilibre structurel démographique et géographique des communes à l'origine des difficultés importantes qu'elles connaissent.
- Forte dispersion des groupements ruraux concernés par la communalisation.
- Lien de causalité clairement défini entre communalisation et développement.

Dans ce cadre, il est à noter que:

- 76% de la population communale en Tunisie se trouve sur le littoral, dont 35% réside dans les communes situées aux chefs-lieux des gouvernorats.

- 32% de la population vivaient dans un milieu rural non communal dont 70% sont moins de 5000 habitants.
- Plus de 78% des groupements ruraux de moins de 5000 habitants sont situés dans 13 gouvernorats dont les 2/3 sont à l'intérieur du pays.
- 77% des groupements ruraux sont situés dans des délégations à taux de développement local moins de 50%.

Après l'adoption du nouveau Code des Collectivités Locales (CCL) en 2018 en tant qu'une loi organique, et de l'élection des premiers Conseils Municipaux issus de la transition démocratique, les communes tunisiennes avaient plus que jamais besoin de se doter d'outils de planification et de gouvernance à la hauteur des enjeux auxquels elles sont confrontées et des attentes des citoyens qui ne cessent de croître.

2. Planification du developpement local

Le développement local est un processus participatif qui encourage et contribue à la formation de partenariats entre des intervenants locaux pour qu'ensemble, ils élaborent et mettent en œuvre, grâce aux moyens et aux avantages compétitifs locaux, une stratégie de développement dont l'objectif final est la création d'emplois décents et la stimulation de l'activité économique.

La planification du développement local passe par plusieurs outils, dont principalement le Plan de Développement Local (PDL). Cet outil, comme stipulé dans l'article 105 du CCL, constitue le cadre de référence pour l'action et les interventions des collectivités locales et des organes qui en dépendent en matière de développement global. Chaque commune est demandée d'élaborer son PDL en se basant sur le diagnostic de la réalité du territoire et en allant vers une vision concertée du développement déclinée en des objectifs stratégiques, et ce afin de:

- répondre aux attentes des citoyens.
- procéder à la priorisation et la budgétisation des projets communaux.
- planifier les investissements selon les conditions de financement en vigueur et par conséquent, stimuler l'activité économique locale en boostant la création d'emplois et la croissance des richesses.

L'élaboration des PDL suit une approche participative par définition. En effet, le CCL identifie la démocratie participative comme étant le fondement des processus de planification locale.

Le PDL est un outil de planification stratégique participative du développement à l'échelle de la commune et de déploiement des politiques publiques locales. Son élaboration et sa mise en œuvre se basent sur une approche participative et inclusive, impliquant à la fois les acteurs locaux et régionaux, aussi bien institutionnels, de la société civile que du secteur privé, et la population locale.

En effet, le PDL permet:

- l'ancrage du processus de décentralisation.
- la complémentarité et la coordination entre organismes de l'Etat pour le développement des communes.
- l'ancrage de la démocratie participative sur le plan local.
- le renforcement du sentiment d'appartenance et citoyenneté.
- la création d'une base de données pour les communes.
- l'affectation budgétaire sous une vision stratégique du développement de la commune.

L'élaboration des documents de planification et des programmes d'investissement passe par un processus délicat et long à fin d'identifier les besoins, de fixer les objectifs et les priorités, d'élaborer un plan d'action, pour pourvoir par la suite, le mettre en œuvre.

Etant un document global et inclusif, le PDL doit garantir la participation réelle de tous les acteurs locaux (y compris les individus) et la prise en considération de toutes les dimensions de développement notamment la dimension spatiale, économique, socioculturelle et environnementale.

Dans l'espérance de couper avec le modèle classique dit « centralisé » avec une approche sectorielle, une administration centralisée, où les décisions sont prises du sommet vers la base avec une quasi-absence de coordination et de concertation interne ou externe, il a fallu repenser l'approche classique d'élaboration du PDL, cet outil hautement stratégique pour la gestion de l'économie locale et la bonne gouvernance. C'est pourquoi, son élaboration doit privilégier l'approche participative qui tienne compte de la pertinence des besoins et de la cohérence des actions. Cette démarche participative doit être soutenue par tous les intervenants dans les affaires locales, dont les services déconcentrés, les autorités locales, la société civile, les structures non gouvernementales ainsi que les habitants. Ils doivent, tous ensemble, effectuer les choix, prendre les décisions et faire les arbitrages qui s'imposent.

3. Experience du project "Initiative pilote pour un developpement local integre" (IPDLI) dans la planification locale

Dans le cadre de son intervention, l'Organisation Internationale du Travail (OIT) à travers le projet « Initiative Pilote pour un Développement Local Intégré » (IPDLI), financé par l'Union Européenne (EU) et la Coopération Suisse, a pour objet de soutenir le processus de décentralisation dans les nouvelles communes afin de créer une dynamique économique locale qui génère des offres d'emplois favorables en favorisant la concertation entre les différents acteurs locaux, accompagner les nouvelles équipes communales, apporter une réponse intégrée fondée sur la valorisation des richesses locales et la création de petites et moyennes entreprises (PME).

En 2018 et dans une phase pilote, le projet IPDLI a accompagné 12 communes (dont 9 nouvelles communes) pour l'élaboration de leurs PDL à travers une démarche qui a permis d'appliquer et de mettre en valeur les réglementations imposées dans le CCL.

En 2019 et suite à une requête urgente du gouvernement tunisien, le projet IPDLI était appelé, après validation de la délégation de l'UE, à généraliser l'approche adoptée sur les nouvelles communes restantes (77 communes) pour les accompagner à l'élaboration de leurs PDL et leurs Programmes d'Investissement Locaux (PIL).

L'urgence de la mission venait du fait que les nouvelles communes devraient pouvoir rapidement fournir des services aux populations dont les attentes en matière de « communalisation » sont élevées. La population rurale ayant des besoins spécifiques et différents de ceux des mandats actuels des communes qui devront fournir de nouveaux types de services pour lesquels elles ont peu d'expérience.

Par ailleurs, l'approche adoptée par le projet IPDLI dans la phase pilote a démontré ses preuves en termes d'efficacité et d'efficience dans la planification du développement local, grâce au

recours à des outils innovants exploitant la digitalisation et les NTIC dans les différentes étapes d'élaboration des PIL.

4. Defis de la planification locale et roles des NTIC

L'élaboration des documents de planification et des programmes d'investissement est une tâche complexe qui nécessite un investissement en temps et en ressources.

Pour garantir une planification inclusive et prendre en compte toutes les dimensions du développement, telles que la dimension spatiale, économique et sociale, il est indispensable d'avoir un PDL global et inclusif. Cela implique la participation de tous les acteurs locaux, y compris les individus.

Les NTIC peuvent jouer un rôle clé dans la simplification de ce processus en permettant une collaboration plus rapide et plus efficace entre les différents acteurs impliqués.

Par ailleurs, la mise en place d'un processus de planification participative fait face à des enjeux majeurs, notamment:

- la grande disparité régionale en termes de développement socio-économique
- le manque de confiance et rupture du dialogue entre services publics et société civile
- l'absence d'acteurs économiques locaux de moyenne dimension
- la crise de l'emploi, surtout chez les jeunes, qualifiés ou non
- la sous exploitation des potentiels et ressources locales
- le lancement du processus de décentralisation
- les pressions sociales urgentes en hausse
- la culture citoyenne naissante centrée sur les droits et négligeant les devoirs
- le manque d'informations, de statistiques et bases de données au niveau local

Comment les NTIC peuvent-elles contribuer à trouver des échappatoires à ces enjeux ? De quelle manière l'utilisation des NTIC peut-elle faciliter le processus d'élaboration des projets de planification et de développement local ? Comment le développement local peut contribuer à l'employabilité?

D'après l'expérience menée par le projet IPDLI, qui a couvert près de 90 communes, l'élaboration du PDL peut se schématiser en plusieurs phases, liées les unes aux autres (FIGURE 1), et qui mènent à l'adoption d'un plan d'action spécifique à la commune (PDL) décliné en PIL.

L'innovation dans l'approche adoptée par le projet IPDLI est l'intégration et le recours aux NTIC dans toutes les phases du processus d'élaboration du PDL. D'ailleurs, l'usage des NTIC est indispensable dès la phase préparatoire du PDL, passant par les phases de diagnostic territorial et d'identification, voire de priorisation des projets de développement, jusqu'à la phase de promotion et de recherche de fonds pour la mise en œuvre des projets.

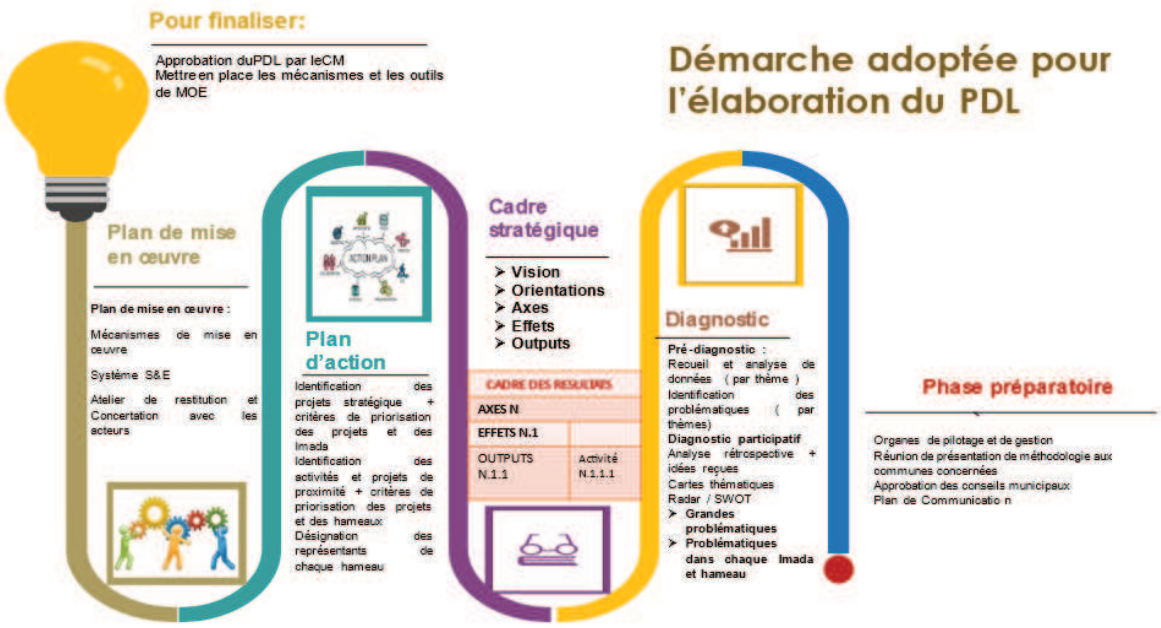

Figure 1: Démarche adoptée pour la planification locale

4.1. Travaux préparatoires de l'élaboration du PDL

Les travaux préparatifs pour l'élaboration du PDL nécessitent beaucoup d'efforts pour informer et mobiliser les acteurs locaux et les habitants. Le recours aux réseaux sociaux est d'une grande utilité pour faciliter la communication avec le grand public, que ce soit pour les informer sur les différentes activités relatives à la préparation du PDL, ou pour être à l'écoute de leurs attentes, leurs avis, leurs priorités et, voir même, leurs feedbacks. Ces réseaux permettent de couvrir et de cibler la population dans les diverses zones de la commune et d'impliquer les différentes catégories concernées.

La mise en place de la stratégie de communication et d'information autour de l'élaboration du PDL repose principalement sur les NTIC, notamment pour les communes rurales, en matière de:

- Amélioration de la communication entre les parties prenantes : Les NTIC ont amélioré la communication entre les différentes parties prenantes impliquées dans l'élaboration des programmes d'investissement, notamment les organisations de développement, le conseil municipal, les entreprises privées et les communautés locales.
- Les outils de communication se sont focalisés principalement sur les réseaux sociaux (facebook, instagramme, etc.), les plates-formes de collaboration en ligne, les sites Web (de la commune, du ministère, des organisations locales, ...).
- Accès à l'information : Les NTIC ont aidé à fournir des informations aux communautés rurales sur les projets de développement en cours, notamment les objectifs, les calendriers et les progrès réalisés. Les communes n'ont pas hésité à publier et à partager toutes les informations sur leurs sites Web et leurs pages facebook.
- Participation communautaire : Les NTIC ont offert aux communautés à participer de manière plus active au processus de planification via la mise à leur disposition d'outils de participation en ligne, tels que les forums de discussion et les espaces de dialogues.
- Sensibilisation et mobilisation : Le plaidoyer et la sensibilisation des citoyens à s'adhérer activement dans le processus de la décentralisation n'était pas possible sans la conception de supports et d'outils multimédia adéquats (films, spot, ...), en particulier chez les communautés rurales où le degré de mobilisation et de participation dans la vie politique est assez critique.

Ainsi, les NTIC interviennent pour valoriser la stratégie de communication et d'information développée par la commune pour l'élaboration du PDL afin d'assurer une pleine cohérence des actions préconisées, faire intervenir un maximum d'acteurs pour une plus grande appropriation et assurer la pérennité des actions.

4.2. Diagnostic territorial

Le diagnostic territorial est une phase cruciale dans l'élaboration du PDL. Il faut veiller à établir un diagnostic fiable si l'on veut des remèdes appropriés.

Le décryptage des besoins dans un diagnostic territorial permet de définir le public cible de ce diagnostic (Pour qui allez-vous réaliser ce diagnostic ?) et les résultats attendus (Pourquoi allez-vous réaliser ce diagnostic ?). Dans ce cadre et selon l'article 106 du CCL, le conseil de la collectivité locale approuve le PDL en prenant en considération les éléments suivants:

- les exigences du développement durable,
- l'encouragement des jeunes à créer des projets,
- l'égalité entre les personnes et l'égalité des chances entre les sexes,
- la promotion de l'emploi,
- la promotion des personnes souffrant d'handicaps,
- la lutte contre la pauvreté,
- l'équilibre entre les zones de la collectivité locale.

A cet effet, la commune est appelé à recueillir des données et s'obligent à tenir une base de données statistiques locales précises et classées en particulier selon le sexe et le secteur socioéconomique et à la mettre à la disposition des pouvoirs publics, des chercheurs et du public à l'effet de les exploiter dans l'élaboration des politiques publiques et plans de développement ainsi que les différentes recherches, sous réserve de respecter la législation relative à la protection des données personnelles, et ce conformément à l'article 34 du CCL.

Une fine connaissance du territoire permettra à la commune de cibler ses interventions et d'ajuster ses décisions. L'enjeu d'un diagnostic territorial est de parvenir à faire s'enrichir mutuellement les données quantitatives et qualitatives. Bien que les données quantitatives sont utiles quand on cherche à décrire le qui, le quoi, le où et le quand, les données quantitatives sont aussi utiles quand on cherche à expliquer le comment et le pourquoi.

Quelque soit le type de donnée à recueillir (quantitative ou qualitative), les outils à utiliser pour assurer la fiabilité, l'efficacité et l'efficience du diagnostic jouent un rôle vital dans l'opération et par conséquent la garantie d'une meilleure employabilité des jeunes et la durabilité de la croissance économique. Les NTIC se place ainsi au cœur du processus du diagnostic territorial, dès l'étape de collecte des données et l'analyse de ces dernières, jusqu'à la communication et la vulgarisation des résultats.

Afin de mener le diagnostic territorial, la démarche adoptée en privilège principalement les outils de diagnostic suivants pour le recueil et la production des données:

4.2.1. Système monographique communal

Il s'agit de mettre en place une base de données focalisée sur une batterie d'indicateurs relative à la commune à partir d'autres sources administratives (nationale, régionale ou locale). L'objectif

de cette monographie est de centraliser les données sectorielles disponibles (relatives aux secteurs de l'agriculture, la santé, l'éducation, le tourisme, l'économie, ...) qui couvrent le territoire communal en absence d'une harmonisation dans le système statistique national au niveau du découpage géographique des collectivités locales et le découpage administratif actuel.

Figure 2: Architecture du système monographique communal

La consolidation d'un système d'information pour archiver et stocker ces données sectorielles enrichit le degré de connaissance du conseil communal ainsi sa capacité de maitrise de son territoire dans l'identification des besoins locales les obstacles potentiels et les opportunités pour le développement. Veiller à l'alimentation et la mise à jour de cette base de données offrira à la commune de dresser des tableaux de bords thématiques pour suivre et évaluer son développement territorial.

4.2.2. Enquête ménage digitalisée

En absence de données chiffrées sur les caractéristiques des habitants du territoire communal et vue les limites du système statistique national à refléter la dimension locale, la démarche adoptée a envisagé la mise en place d'une enquête ménage sur « la population et l'emploi des jeunes ». L'administration de l'enquête, ainsi que sa mise en œuvre, étaient totalement digitalisées.

Ayant obtenu l'approbation et le visa officiel des autorités tunisiennes, l'enquête servira à produire des indicateurs statistiques sur:

- les conditions de vie des ménages (état du logement, commodités de vie, les biens du ménage, accès aux services, ...)
- les ressources économiques des ménages
- les Difficultés et les attentes des ménages
- les caractéristiques démographiques, éducatives et économiques des habitants
- Etc.

En se basant sur un logiciel spécialisé (CSPro), le questionnaire de l'enquête s'est programmé pour un usage via tablette. Les coordonnées de géolocalisation ont permis aux superviseurs/ enquêteurs de respecter le plan de sondage défini et d'être fidèle à la méthodologie d'échantillonnage conçue.

Toute la documentation, en particulier les guides de formation et les zones de dénombrement relatives à chaque enquêteur, est une partie intégrante de la mémoire des tablettes.

Grâce à la mise en place d'un système de synchronisation, les résultats des interviews avec les ménages sont traités, validés et acheminés directement vers un serveur distant. L'administrateur, via son tableau de bord, assure la supervision de la qualité des résultats et l'avancement des travaux de terrain.

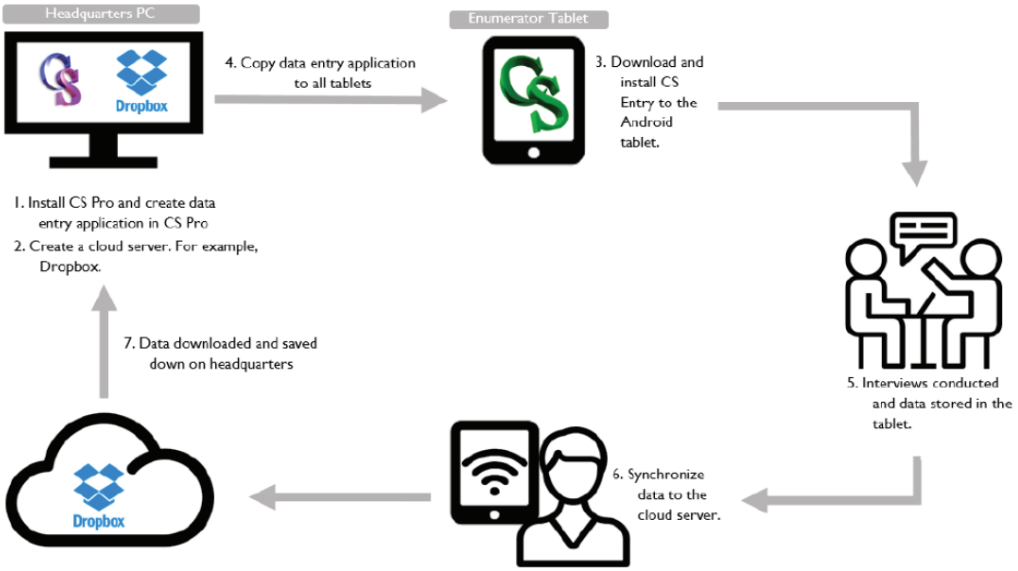

Figure 3: Architecture de la mise en place de l'enquête ménage

La visualisation, le traitement et l'analyse des données de l'enquête sont pris en charge par des logiciels spécialisés (SPSS, MAPINFO, ...) afin de produire des outputs interprétables qui répondent aux objectifs/ besoins identifiés dans le diagnostic.

4.2.3. Système de géolocalisation des structures dans le territoire communal

Dans le but d'orienter les stratégies de développement locales de la commune en tenant compte des potentiels structurels existants (économiques, éducatifs, culturels, sportifs, ...) et d'identifier les types d'interventions appropriés afin de contribuer à l'amélioration de l'employabilité des jeunes (Chercher l'équilibre entre l'offre et la demande), un système de géolocalisation des différentes structures basées sur le territoire communal a été conçu.

La mise en place d'un tel outil a permis de :

- Localiser (via les coordonnées GPS) les principales structures institutionnelles et économiques dans la commune
- Localiser (via les coordonnées GPS) les principales structures institutionnelles et économiques dans la commune
- Classifier les structures identifiées selon leurs catégories/sous-catégories (selon l'usage) et la nature de la propriété (privé, public, ...)
- Instaurer une base de données des structures identifiées (localisation, photo, description, observations pertinentes).
- Générer des cartes thématiques des différentes structures identifiées
- Orienter l'employabilité vers les créneaux et les services pour satisfaire aux demandes locales

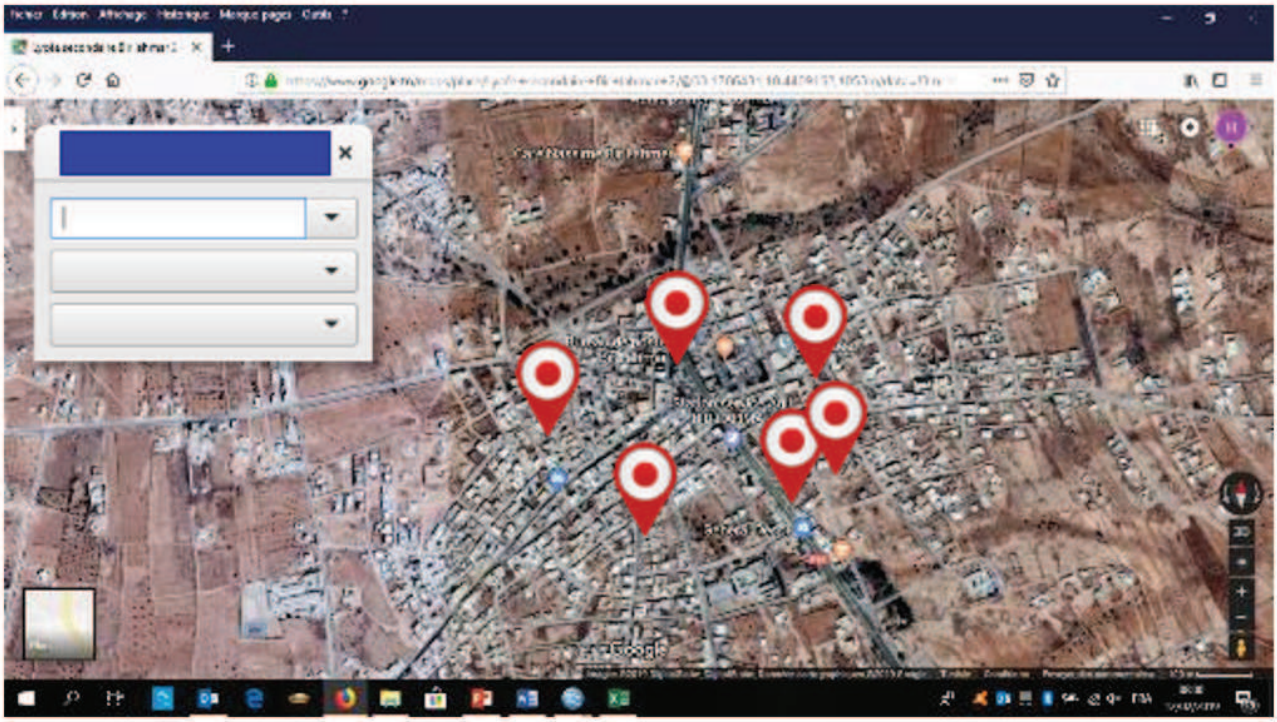

Figure 4: Aperçu du système de géolocalisation des structures dans le territoire communal

4.3. Elaboration du plan d'action du PDL

L'élaboration d'un plan d'action présente un moment crucial dans la préparation du PDL. Cette phase exige l'arbitrage et la sélection des projets de développement communaux à réaliser. Afin de respecter les aspects participatifs et inclusifs du processus, une démarche transparente et scientifique s'impose pour ne pas favoriser une localité ou une catégorie d'individus dans la même commune.

En effet et suite aux différents ateliers participatifs organisés dans le cadre de préparation du PDL, les participants partagent plusieurs propositions de projets communaux et sectoriels selon les besoins exprimés dans les différentes localités. Face aux contraintes budgétaires, le conseil communal se trouve obliger de s'engager à réaliser que quelques projets. Afin de trancher dans la sélection de ces projets, les participants aux ateliers sont invités à définir des critères de priorisation objectifs et mesurables.

La priorisation des projets permettra aux structures communales et sectorielles de diriger les investissements vers les besoins réels de la population, tout en prenant en compte les ajustements nécessaires pour garantir la faisabilité des projets.

Afin de garantir la réussite de cette phase, une base de données des projets proposés est conçue. Chaque projet est notifié selon les critères de priorisation prédéfinis par la population en relation avec les besoins exprimés. Un utilitaire d'aide à la décision se charge de compiler les données et d'affecter un score pour chaque projet de développement proposé. Ainsi, tous les projets seront répertoriés par type et classés par ordre de priorité pour chaque localité de la commune. Il sera nécessaire d'évaluer l'éligibilité des projets en fonction des critères de priorisation, puis de valider leur faisabilité technique et financière avant de les inclure dans la planification finale.

4.4. Financement du PDL

L'élaboration du PIL permet de concrétiser les attentes des communautés locales et de traduire en partie le PDL préparé. Le PIL associe les projets priorisés avec les ressources financières nécessaires, voire disponibles, pour être mis en œuvre efficacement.

Pour assurer la levée de fonds, une plateforme digitale est conçue qui regroupe les projets à la recherche de financement figurant dans le PIL. Cette plateforme est administrée par le conseil communal et accessible par les bailleurs de fonds. Elle offre un espace virtuel pour décrire les projets de développement communaux qui répondent aux attentes et aux besoins des citoyens, d'une part, et d'offrir aux bailleurs l'opportunité de cibler au mieux leurs interventions dans le pays conformément à leurs cadres et capacités financières.

5. Conclusions

En conclusion, le recours aux outils numériques et des NTIC a révolutionné la démarche et la méthodologie d'élaboration et de mise en œuvre des PDL des communes. La planification des projets communaux d'infrastructure rurale et urbaine est pilotée dans son intégralité par des outils et des utilitaires technologiques permettant d'optimiser le coût et la durée de la planification.

La maitrise de l'innovation technologique au service de la planification des programmes d'investissement pour le cas des nouvelles communes tunisiennes a démontré l'amélioration du degré de l'objectivité et de la transparence dans le ciblage et l'orientation des ressources financières en réponse aux besoins et aux attentes des communités locales.

L'utilisation des NTIC dans la communication et la mobilisation de la population pour l'élaboration du PDL a renforcé l'approche participative et inclusive exigée dans la démarche et la philosophie de la décentralisation, en impliquant tous les acteurs locaux et prenant en compte toutes les dimensions de développement.

La planification des projets communaux d'investissement n'est plus une mission subjective, elle se base grâce aux TIC sur des diagnostics scientifiques permettant de dégager les vrais attentes et besoins de la population.

> La capacité d'analyse et de compilation offerte par la technologie offre une solution complète et efficace pour la planification des projets de développement dès la phase préparatoire du PDL, jusqu'à la phase de levée des fonds et de mise en œuvre. Cette approche favorise la participation et l'intégration des populations locales dans la vie économique, et offre un diagnostic précis et concis pour la réalisation de projets d'infrastructure répondant aux besoins réels de la population.

Par ailleurs, le rôle de l'innovation technologique ne se limite pas uniquement au niveau de la planification des projets d'infrastructure. Des expériences ont prouvé la valeur ajoutée des NTIC dans l'optimisation des ressources et la perfection des travaux en termes de délai et de qualité pour les phases d'exécution et de réalisation des projets d'infrastructure à travers une panoplie diversifiée d'outils technologiques : les utilitaires de conception et de simulation des plans, le recours aux outils de Gestion de la Production Assistés par Ordinateur (GPAO) dans le domaine de la construction, la digitalisation des journaux de chantiers dans le secteur du bâtiment des travaux publics, le suivi des indicateurs de performance, etc.

Promoting public procurement for MSMEs growth and transition to formality

Vicky Leung

06

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Vicky Leung

About the author

Vicky Leung works as Technical Officer on Transition to Formality in the Development and Investment Branch (DEVINVEST) of the ILO Employment Policy Department in Geneva. Since joining the ILO in 2010, her work has focused on the transition to formality, especially on the use of digital technologies, youth, employment promotion and poverty reduction. She previously worked in the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) in Geneva and the United Nations Organization Stabilization Mission in the Democratic Republic of the Congo (MONUSCO). She holds a Master of International Relations from Sciences Po Lille in France.

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CONTENTS

Abstract

MSMEs are the main source of employment for millions of workers around the world and most of them are informal especially in developing countries. In Africa, informal employment is the main source of employment (84.3 per cent) and informal enterprises provide more than 70 per cent of total informal employment. In this regard, MSMEs growth and transition to formality represent an opportunity for formal job creation and inclusion of those operating in the informal economy. However, in reality, MSMEs face different challenges to grow due to lack of access to market, business support and so on. The lack of growth generally implies low productivity, poor working conditions and occupational and safety and health and high mortality. All these aggregate to the barrier to formalization for MSMEs because they are not able to afford the cost of compliance associated with formality, for instance, registration, taxation and social security for their workers. Therefore, breaking this vicious cycle becomes important and public procurement, as part of public investment, can provide incentive for driving MSMEs growth and transition to formality.

Available data show that public procurement represents on average 13 per cent to 20 per cent of GDP across countries. African countries spend an average 17 per cent of their GDP on public procurement. While the sizable public spending through public procurement can bring potential influence, not all public procurement systems are designed and implemented towards the outcomes of MSMEs growth and transition to formality. Then, making public procurement more strategic to drive MSMEs growth for formal job creation and facilitate transition to formality, including their workers, for inclusive development, is the main objective of this paper.

This paper investigates different elements that shape an integrated public procurement system and how they can influence the inclusion of MSMEs and their formalization in public procurement process. These elements include governance and political contexts, laws and regulations, professional institutions, procurement procedures and technological infrastructure. The cases of Chile and Republic of Korea will be used for illustration and demonstration of good practice examples. This paper concludes with lessons learnt from these two countries and recommendations for those countries, policy makers and development practitioners who are searching for innovations to design and implement their public procurement system to advance MSMEs growth and transition to formality for better formal job creation and inclusive development outcomes.

Key takeaways:

- **Making public procurement more strategic towards MSMEs growth and transition to formality**
- **Public procurement, as part of public investment, is powerful incentive**
- **An integrated public procurement system and the application of new technologies in design and implementation are key for success**

1. Introduction

Globally, MSMEs account for creating over two-thirds (70 per cent) of total employment (ILO, 2019b). However, most of these jobs are informal given that more than half of the informal employment around the world are in informal enterprises (51.9 per cent) (ILO, 2018). In Africa, informal employment is the main source of employment (84 per cent) and informal enterprises provide more than 70 per cent of total informal employment (ILO, 2023). In this regard, MSME growth and transition to formality represent an opportunity for formal job creation and inclusion of those operating in the informal economy. However, in reality, MSMEs face different challenges to grow and formalize. Poor growth generally implies low productivity, poor working conditions and occupational and safety and health and high mortality. All these compounds the drivers of informality and aggregate to the barrier to formalization for MSMEs because they are not able to afford the cost of compliance associated with formality, for instance, registration, taxation and social security for their workers.

Available data show that public procurement represents on average 13 per cent to 20 per cent of GDP across countries (World Bank, 2020). African countries spend an average 17 per cent of their GDP on public procurement (Arisoy et al., 2023). While this sizable public spending through public procurement can bring potential influence, for instance, on private sector development in the construction sector in employment intensive infrastructure works, not all public procurement systems are designed and implemented towards MSMEs growth and transition to formality. Then, making public procurement more strategic to drive MSMEs growth for formal job creation and facilitate transition to formality, including their workers, for inclusive development is the main objective of this paper.

This paper investigates different elements that shape an integrated public procurement system and how they can influence the inclusion of MSMEs and their formalization in public procurement process. These elements include governance and political contexts, laws and regulations, professional institutions, procurement procedures and technological infrastructure. The cases of Chile and Republic of Korea will be used for illustration and demonstration of good practice examples because their public procurement systems have shown comprehensiveness, innovation, especially making good use of new technologies to establish the e-procurement and positive impact on MSMEs growth and transition to formality. This paper concludes with lessons learnt from these two countries and recommendations for those countries, policy makers and development practitioners who are searching for innovations to design and implement their public procurement system to advance MSMEs growth and transition to formality outcomes.

2. Public procurement: Incentive for MSMEs growth and transition to formality

The role and contribution of enterprises in transition to formality through formal job creation is clear. The adoption of the Sustainable Development Goals (SDGs)[13], the ILO Job Creation in Small and Medium-Sized Enterprises Recommendation, 1998 (R189) and Transition from the Informal to the Formal Economy Recommendation, 2015 (R204) represents international and tripartite consensus on this subject. R189 calls for countries to consider policies that include specific measures and incentives aimed at assisting and upgrading the informal sector to become part of the organized sector and R204 emphasizes the importance of formalizing micro and small economic units. Founding on the experience of countries across regions, R204 identifies three drivers of transition to formality, including: (a) facilitate the transition of workers and economic units from the informal to the formal economy, while respecting workers' fundamental rights

[13] SDG's target 8.3 "promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage formalization and growth of micro-, small- and medium-sized enterprises including through access to financial services."

and ensuring opportunities for income security, livelihoods and entrepreneurship; (b) promote the creation, preservation and sustainability of enterprises and decent jobs in the formal economy and the coherence of macroeconomic, employment, social protection and other social policies; and (c) prevent the informalization of formal economy jobs.

Concerning the formalization of micro and small economic units in R204, countries should promote access to public procurement, consistent with national legislation, including labour legislation, through measures such as adapting procurement procedures and volumes, providing training and advice on participating in public tenders, and reserving quotas for these economic units. The ILO Labour Clauses (Public Contracts) Convention, 1949 (C94), and Recommendation, 1949 (R84) stress the importance of labour clauses in public contracts to ensure the working conditions of workers and guide governments to set an example by acting as model employers to provide a high standard of social protection at the national level (ILO, 2008).

Regarding the potential of public procurement, evidence shows that it can bring positive impact on enterprises growth and transition to formality. Table 1 summarizes selected impact evaluation studies in developing and developed countries that estimate the effect of enterprises' participation in public procurement on their development and employment. They are selected in response to the focus of this paper on MSMEs growth and transition to formality and based on the indicators of business growth, lifespan, job creation and formalization. The evidence on business growth and job creation is significant.

Table 1: Impact evaluations of public procurement on enterprises and employment

Country	Indicator	Objective	Effect
Austria (Gugler et al., 2020)	▶ Job creation	▶ Estimate labour demand in a winner–runner-up setting in public procurement for construction.	▶ Winning firm significantly increases labour demand in the weeks following an auction and employs about 80 workers (around 3 per cent of the workforce) more. ▶ Winners predominantly fire fewer workers after winning than runner-up firms.
Brazil (Ferraz et al., 2015)	▶ Business growth ▶ Job creation ▶ Formalization	▶ Examine whether firms that win government procurement contracts grow more compared to firms that compete for these contracts but do not win.	▶ Winning at least one contract in a given quarter increases firm growth by 2.2 percentage points over that quarter, with 93 per cent of the new hires coming from either unemployment or the informal sector. ▶ These effects persist well beyond the length of the contracts because firms participate and win more future auctions, as well as penetrate other markets.
Croatia (Srhoj, 2021)	▶ Job creation	▶ Estimate impact of winning a public procurement contract on firms' employment.	▶ Winning a public procurement contract has a small positive impact on a firm's short-run employment in the construction sector.
Italy (Cappelletti and Giuffrida, 2021)	▶ Business lifespan	▶ Quantify the impact of procurement spending on firm survival.	▶ Firms in the construction sector that receive public contracts survive longer. ▶ This effect accrues over time, reaching 20 percentage points after ten years.
Spain (di Giovanni et al., 2022)	▶ Business growth	▶ Study the effects of public procurement on firm's outcomes and the macroeconomy.	▶ Granting procurement contracts to small firms helps these firms grow and overcome financial constraints in the long run, but the aggregate effects can reduce GDP.
Uganda (Hoekman et al., 2022)	▶ Business growth ▶ Job creation	▶ Study the impact of participation in public procurement on firm performance.	▶ Overall, selling to the government is associated with higher levels of profits, greater size (both assets and employment) and productivity. ▶ Participation in procurement triggers a significant boost in sales and labour productivity by about 73 per cent and 32 per cent respectively.

3. From design to implementation: An integrated public procurement system

The complexity of public procurement system and procedures is the major barrier for MSMEs to participate in public procurement market given their limited financial, technical and administrative capacities (OECD, 2019). These barriers cover a range of issues from design to implementation of public procurement system and procedures as shown in figure 1 (Loader, 2015) (Mohungoo et al., 2020) (Ortuzar et al., 2017). This section investigates different elements that shape an integrated public procurement system, and how they can influence the inclusion of MSMEs and their formalization in public procurement process.

Sources: (EBRD, 2017) (Loader, 2015) (Mohungoo et al., 2020) (Ortuzar et al., 2017)

Figure 1: Barriers to MSMEs' participation in public procurement

3.1. Enabling governance and political contexts

Corruption in public procurement enables well-positioned enterprises to dominate markets and restrict the ability of new enterprises to obtain contracts and access markets through innovation. MSMEs, who often have less financial or political means to access public procurement opportunities, will likely lose out given the extra challenge caused by corruption instead of being the driver for creating jobs, thus reducing informality (Turkewitz, 2020).

Chile suffered from several corruption scandals in public procurement between 2010 and 2014. Increasing transparency and ensuring consistency in public procurement were the main objectives of the series of reforms. Those reforms tried to tackle corruption in public procurement by modifying the incentives and dynamics in the overarching system of governance. Some proposed actions included unifying the entire procurement system under ChileCompra[14], strengthening ChileCompra with the extension of mandate to coordinate, supervise, and support the entire integrated public procurement system, providing training for staff, strengthening reporting requirements and further standardizing public purchases that go across government agencies (Nam, 2020). In the Republic of Korea, a similar mechanism has been put in place to prevent and tackle corruption in public procurement, especially with the launch of the Korean ON-line

[14] ChileCompra is the government agency that is responsible for managing the public procurement of 850 public organizations in Chile. https://www.chilecompra.cl/que-es-chilecompra/

E-Procurement System (KONEPS) in 2002 (OECD, 2016d). For example, the Korea Fair Trade Commission (KFTC) uses an analysis automated system in KONEPS to detect suspicious bid strategies and monitor the public procurement for any evidence of bid rigging. According to the Korea Anti-Corruption and Civil Rights Commission, the integrity perception index of the Public Procurement Service has improved from 6.8 to 8.52 out of 10 as the highest score, since the launch of KONEPS (OECD, 2016b). Since January 2009, all procuring public entities must provide the relevant information to the KFTC, allowing the KFTC to identify and investigate potential bid rigging cases (DCED, 2017).

Meanwhile, strategic public procurement means pursuing complementary government policy goals. In Chile, using public procurement as an incentive has always been part of the formalization policy package (ILO, 2014) (ILO, 2019a) and crisis mitigation and recovery plan (Box 1).

Box 1: Supporting MSMEs through public procurement in response to COVID-19 crisis in Chile

In April 2020, Chile launched a new public procurement modality, called "Compra Ágil" in Spanish, in the context of the Emergency Economic Plan in response to the COVID-19 crisis. The modification of the Public Procurement Law (No. 19,886, Decree No. 821) increases the threshold from 10 to 30 monthly tax units. This measure aims at expanding business opportunities for MSMEs to access public procurement contracts which are equal to or less than the amount of 30 monthly tax units, equivalent to about US$ 2,300 in January 2023, since contracts below this threshold represent 80 per cent of public procurement opportunities on the online public market platform (www.mercadopublico.cl).

This public procurement modality also reduces bureaucracy. The procuring public entities only need to acquire three quotes through the online public market platform and issue a purchase order if the supplier accepts the offer. Given the small amount of contract value, the signing of a contract with the selected supplies is not required. The contractual arrangement between the procuring public entity and the supplier is based on the acceptance of the purchase order via the online public market platform.

In 2020, 114,013 purchase orders were processed through "Compra Ágil" with the total amount of US$ 82 million and MSMEs were awarded 81 per cent of the total amount contracted. By the end of 2021, the total number of purchasing orders increased to 509,000, worth more than more than US$389 million. The sharp increase in 2021 was 260.5 per cent compared to April and December 2020 and 77 per cent of the total amount was awarded to MSMEs.

Sources: ChileCompra Compra Ágil https://www.chilecompra.cl/compraagil/ ChileCompra public procurement directives 35 and 43) https://www.chilecompra.cl/directivas-de-compra (APEC, 2021) ChileCompra Annual Reports 2020 and 2021 https://www.chilecompra.cl/category/centro-de-documentacion/institucional/balances-y-planes-estrategicos-chilecompra/

The Korean public procurement system has undergone different stages of development and changes of focus during the last few decades. The latest policy goal of public procurement policy is to overcome crisis and support economic recovery through strategic use of public purchasing power. The Public Procurement Service recognizes the role of MSMEs as the backbone of the national economy and put great emphasis on promoting MSMEs in public procurement to achieve policy goals[15], especially in times of crisis and for job creation that helps prevent informalization of the formal labour market and promote a compliance culture of formality (Box 2).

[15] Overview of domestic procurement in Korea https://www.pps.go.kr/eng/content.do?key=01156

Box 2: Formal job creation and compliance promotion in public procurement policy in the Republic of Korea

Following the policy guidance anchored in the Procurement Business Act, Article 6 on social responsibility, the Public Procurement Service considers formal job creation as one of the major areas under its socially responsible procurement policy. It established a dedicated online shopping mall, called "Venture Nara" (https://venture.g2b.go.kr:8321/index.jsp), in 2018 for supporting start-ups and venture companies, mainly MSMEs, to expand their sales channels in the public procurement market and provide production registration support and preferential treatment when bidding.

For MSMEs who hire young people, create full-time employment and improve working conditions, the Public Procurement Service provides preferential treatment by giving them extra points in the bidding evaluation process and the Multiple Award Schedule (MAS) during the second stage competition. For those enterprises who had a record of violating employment and labour regulations leading to informality, they will be placed in a disadvantaged position during the bidding process.

Source : Procurement policy on social responsible procurement https://www.pps.go.kr/kor/content.do?key=00712 (Public Procurement Service, 2017) (Public Procurement Service, 2018)

3.2. Adequate laws and regulations

A rule-based system forms an important pillar in the mechanism to create an enabling governance environment for MSMEs' access to public procurement, formal job creation and informality reduction. A study (Hoekman and Taş, 2020) finds that better quality procurement regulation is associated with greater MSME participation and higher probability that MSMEs win contracts. Adequate laws and regulation also facilitate the transition to formality of MSMEs and their workers engaging in public procurement contracts.

In Chile, there are several laws and regulations that underpin the integrated public procurement system and facilitate MSMEs' access to public procurement contracts and transition to formality. The main one is the Public Procurement Law (No. 19,886) which was adopted in 2003 with the objectives of making savings with better use of public resources, simplifying, and reducing bureaucracy in public procurement process, increasing transparency and facilitating access and procurement opportunities to a broad range of suppliers. These objectives respond directly to the barriers that MSMEs face when participating in public procurement. The Act on Subcontracting (No. 20,133) facilitates employment formalization through a certificate validated by the Department of Labour concerning the compliance record with the labour and social security obligations of contractors and sub-contractors and the principal enterprise retains the right to payments or make payments by subrogation in the event of non-compliance by the contractor. This act helps regulate and formalize the production chains vis-à-vis labour and social insurance, which is required in all public contracts, including public subcontracting contracts. Chile adopted the Act on Family Micro-Enterprises (MEF) (Act No. 19,749) in 2002 to facilitate those MSMEs who use their home as workplace to obtain municipal licence with a minimum of requirements in terms of procedures and facilities. Then, they can start operating and notify the Inland Revenue Services of their registration. The municipal licence and the tax identification allow them to have access to the online public market platform of ChileCompra (ILO, 2019a).

In the Republic of Korea, the legal basis of supporting MSMEs to participate in public procurement is based on the Act on Facilitation of Purchase of Small and Medium Enterprise Manufactured Products and Support for Development of Their Markets, which requires public institutions to provide MSMEs with increased opportunities to participate in the procurement process and to win contracts (OECD, 2016d). An annual purchasing goal for MSME-manufactured products is set at 50 per cent or more of total purchasing value and 15 per cent or more of the total purchasing value regarding technology products developed by MSMEs[16].

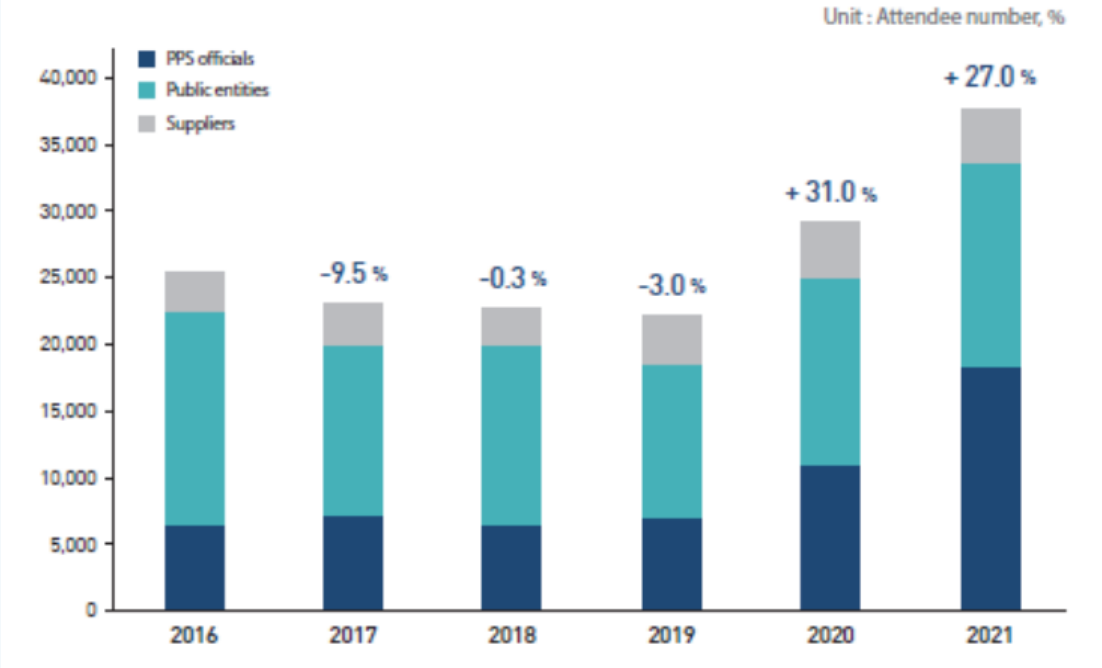
[16] SME product purchase target ratio system https://www.smpp.go.kr/cst/smppInf/SelectLawB.do

3.3. Professional institutions

For the successful implementation of policies, compliance with laws and regulations and quality of outcomes, the competence and professionalization of institutions and procurement practitioners are key. A study (Decarolis et al., 2021) finds that an increase in the procuring institution's competence reduces the number of days of delay, cost overruns and renegotiations in the contracting process and managerial competencies are more important for complex procurement procedures.

ChileCompra has adopted directives aiming at providing recommendations and guidelines to public entities so that they implement measures to reduce barriers and information asymmetries for MSMEs when making their purchases through the public procurement system. Chile also requires a certification process for public procurement officials with four competency levels (OECD, 2021). As of 2022, the certification validity period of different levels has changed from three years for all levels to one year for basic level, two years for intermediate, advanced and expert level[17]. This helps encourage continuous skills development to maintain a team of public procurement professionals. Different modules, for instance, from public procurement regulations, contract management to the procurement modality "Agil Compra", are available online and a virtual chat is available for interactions[18].

The Korean Public Procurement Service applies mandatory training for its staff to ensure suitable skills (OECD, 2021) and sets the objective of fostering public procurement experts and globally competitive MSMEs. During the COVID-19 crisis, the number of trainees, especially Public Procurement Service's officials, increased significantly (figure2) because the Public Procurement Service swiftly switched to virtual courses in May 2020 to ensure the accessibility of trainings and set up a dedicated lecture room for organizing virtual trainings in 2021 given the ongoing pandemic situation (Public Procurement Service, 2021).



Source: Public Procurement Service, 2021.

Figure 3: Number of public procurement trainees (e-learning included) in the Republic of Korea

[17] Certification of Competencies in Public Procurement https://capacitacion.chilecompra.cl/mod/page/view.php?id=11
[18] Trainings for buyers https://capacitacion.chilecompra.cl/mod/page/view.php?id=9868

3.4. Favourable procurement procedures

Procurement procedures represent the realization of strategic public procurement to drive MSMEs growth and transition to formality. They are the element of an integrated public procurement system that MSMEs firstly encounters when engaging in public procurement. Most barriers to MSMEs' participation in public procurement shown in figure 1 are related to procurement procedures rather than lack of political commitment and enabling regulatory environment per se.

3.4.1. Adapting tender specifications

Tender specifications define the scope and extent of public procurement contracts. Inclusive tender specifications are necessary to ensure the market is defined as widely as possible and the bar for entry is a low as possible without compromising the quality of goods and products. Adapting tender specifications with inclusive terms can be through designing tender criteria that are unnecessarily restrictive or by modifying terms that incentivize MSMEs to participate vis-à-vis their capacity of production (OECD, 2017).

In Chile, high volume purchases which belongs to the same purchasing contract are divided into smaller ones so that several suppliers could be awarded a specific tender either based on products or geographic areas. Such practice increases the chances that MSMEs will be awarded a public procurement contract with a small volume that adapts to their capacity. The Republic of Korea has introduced a similar measure in the context of framework agreements (Box 3).

Box 3: Framework agreements in the Republic of Korea

The Republic of Korea has introduced the Multiple Award Schedule (MAS) in 2005 that benefits MSMEs' participation. The Public Procurement Service issues unit-price contracts annually with qualified suppliers and the products and prices are then published online through the KONEPS. Procuring public entities can select and purchase directly without the need of involving the Public Procurement Service to issue a contract. This measure allows a wider pool of qualified suppliers to participate, with the minimum requirements of past delivery performance and satisfactory financial standing, and most MSMEs can meet these requirements to become suppliers. MSMEs account for 98.4 per cent of MAS contractors. The Public Procurement Service also addresses the specific concern of MSMEs, who have less resources to deal with administrative issues, to extend the period of MAS contract from one year to two years to reduce their administrative costs. Since 2008, the second stage competition requirement was introduced to increase transparency and competitiveness in larger purchases.

Source: (DCED, 2017) (OECD, 2016d).

To have a better understanding of suppliers' capacity, ChileCompra carries out an open consultation process with them prior to issuing a tender. The consultation aims to obtain information about prices, the characteristics of the required goods or services, the time that bidders need to prepare, and any other information that might contribute to a successful tendering process. ChileCompra has also set up an online forum with questions and answers for each tender in advance of deadlines for submitting bids (OECD, 2016a).

The Republic of Korea has adopted the set-aside approach to facilitate MSMEs' participation. The Ministry of SMEs and Startups designates a range of specific products that are reserved to be exclusively supplied by MSMEs. As of February 2023, there are 632 products with this designation[19] and there are more than 20 MSMEs who directly produce and supply. According to the Public e-Procurement Information Network (SMPP), the annual amount of purchase of public entities is over KRW 2 billion (about US$ 1.6 million).

[19] List of competitive products for MSMEs https://www.smpp.go.kr/prd/prdinfo/smlpzbtwncmptprd/SelectSmlpzBtwnCmptprdListVw.do

Meanwhile, large enterprises are restricted from participation in tenders for general goods below the World Trade Organization Agreement on Government Procurement (WTO GPA) threshold (OECD, 2016d).

For construction works, the Republic of Korea divides some projects into seven classes according to the size of the work. Only MSMEs are allowed to participate in tenders of the classes that include works below US$ 127 million for civil engineering works and works below US$ 93.2 million for architectural works (OECD, 2016d). The Public Procurement Service relaxed the prior construction experience criterion in tender by reducing the number of required years so that more MSMEs are qualified for bidding opportunities. Moreover, small contractors are allowed to form consortiums as in Chile so that they can increase their chances of winning bids (Public Procurement Service, 2014) but large construction companies are prohibited from doing so (DCED, 2017). The Republic of Korea applies preferential treatment for local enterprises located in non-metropolitan areas, who are mainly MSMEs. Tendering is open exclusively to local firms from the same province for construction works under certain conditions. Some other preferential treatments include setting a certain percentage of local enterprises to participate as mandatory for major national projects, prioritizing the products of local enterprises in the selection of construction materials and offering preference to bidders who provide subcontracts to local enterprises (Dawar and Oh, 2017).

In response to the challenge of disproportionate levels of financial qualifications, Chile evaluates the need and amount of guarantee requests vis-à-vis the situation of MSMEs, especially the informal ones, who face greater challenges than large enterprise to obtain financial instruments such as guarantee bonds. In this case, only contracts with the amount of more than 2,000 monthly tax units, equivalent to about US$ 153,000 in January 2023, will require guarantees[20].

3.4.2. Linking eligibility and formalization

In most countries around the world, access to public procurement opportunities is only available to registered enterprises and informal MSMEs are not eligible in this case. This strategy aims at using public procurement as an incentive to demonstrate the benefits of being formal and incentivize those informal MSMEs who have attained a certain level of capacity to formalize (OECD, 2020). Chile and the Republic of Korea primarily apply this strategy. For example, in Chile, enterprises who wish to become suppliers must have a tax identification to register themselves in the registry of suppliers and the registration is free of charge.

To promote inclusion, the Republic of Korea has set up an online platform, called "Venture Nara", for ventures and start-ups with technology-based products who have difficulties in meeting the requirements to be registered in the KONEPS. To register as a supplier in the KONEPS, enterprises are required to have previous sales records, operation status, and manufacturing facilities. All these requirements are the main features of formal enterprises. Although ventures and start-ups in the Republic of Korea are not necessarily informal, such requirements are obstacles for them to enter the public procurement market. With Venture Nara, ventures and start-ups can easily sell their products to public entities as long as conditions for a direct contract are met. Through the opportunities with Venture Nara, some ventures and start-ups further developed their business, grew and eventually registered in the KONEPS (Observatory of Public Sector Innovation, 2018).

These examples show the different approaches of strategic public procurement for transition to formality. Even though MSMEs represent a category of enterprises, they fall in a broad spectrum of formality with different needs. In this regard, linking eligibility can trigger registration for those MSMEs who are ready to

[20] ChileCompra Directive No.41 on the use of guarantees https://www.chilecompra.cl/wp-content/uploads/2022/09/Directiva41-garantias.pdf ChileCompra Directive No.43 on promotion of MSMEs https://www.chilecompra.cl/wp-content/uploads/2023/01/Directiva43-promocionpymes.pdf

formalize. For those who are still far away from being formal, access to public procurement can help grow their business and gradually advance towards formalization.

3.4.3. Additional weighting on award criteria

While applying the lowest-price criterion has the advantages of simplicity and rapidity, it limits procuring public entities to consider other factors, for instance quality and innovations (OECD, 2016c). Therefore, some countries give additional weighting to MSMEs in the contract awarding process. The gender perspective is also being considered in some cases since women-owned enterprises are more likely to be smaller and informal at the global level (Qasim, 2018).

For developing purchasing processes with inclusion criteria, the Public Procurement Law (No. 19,886) in Chile provides that the bidding rules may contain scores, or weights assigned to bidders that achieve high social impact, including the promotion of MSMEs and local development. For example, women-led enterprises, or those with more than 50 per cent of female workers can apply for the Women Supplier Certification, called "Sello Empresa Mujer" in Spanish (ILO, 2022). This certification can be requested as an evaluation criterion to be included in tender documents or to demonstrate social impact in direct contracting bids below US$ 700 (ITC, 2016).

In the Republic of Korea, MSMEs can become a designated MSME through certification for excellent technology or performance, or through designation as an innovative MSME by the Ministry of SMEs and Startups. Three additional points are given in contract fulfilment capability tests and certification as an Excellent Government Supply Product supplier allows direct contracting with any public entity for purchases. Besides, women-owned businesses are given additional points when selecting Excellent Government Supply Products (OECD, 2016d).

3.4.4. Specific payment terms

MSMEs have less capacity to handle the shortage of cash flow and incompatible payment terms are another barrier for them to participate in public procurement. In this regard, offering specific payment terms would allow greater liquidity for MSME suppliers.

ChileCompra recommends all procuring public entities to better organize their internal payment process and strictly observe the legal obligation of settling the payment no later than 30 days upon receipt of the invoice. If possible, the payment should be settled even shorter than 30 days[21]. In addition, procuring public entities can advance payment if suppliers can provide guarantee so that they have the necessary resource to produce and supply the goods and services without generating additional debt. Concerning those goods and services involving several outputs and deliverables along the production chain, ChileCompra recommends procuring public entities to establish a payment schedule against deliverables[22].

In the Republic of Korea, MSMEs are entitled to an upfront payment of up to 70 per cent of the value of a public procurement contract. Normally, central government entities are entitled to a payment settlement period of up to five days. However, for those contracts for goods with the amount up to US$ 423 800, or at the request of the procuring public entities for other goods contracts, the supplier is entitled to instant payment, that could take as fast as four working hours, upon presentation of the invoice. In these cases, the Public Procurement Service would settle the payment first through its special account and then be reimbursed by the procuring public entities (OECD, 2016d).

[21] ChileCompra Directive No.3 on the payment to supplier in 30 days https://www.chilecompra.cl/wp-content/uploads/2016/11/directiva-n03.pdf
[22] ChileCompra Directive No.12 on implementation of pro-employment measures in the public market https://www.chilecompra.cl/wp-content/uploads/2016/11/directiva-n12.pdf

3.4.5. Providing business support

Given the complexity of public procurement procedures, MSMEs often have difficulty to acquire full knowledge about them. Therefore, MSMEs need targeted business support, including training and mentorship (Box 5), financial and certification support and support to access new markets.

In Chile, trainings to public procurement officials are also offered to MSMEs as suppliers. E-learning courses with different modules concerning the public procurement system are available online at https://capacitacion.chilecompra.cl/ and virtual chats are also available for further enquiry[23]. For those who are not able to attend any of the online course, they can access self-paced learning materials as well. Those trainings including the public procurement modality "Agil Compra", how to register online to be supplier and prepare for a bid and entrepreneurship for women suppliers, are particularly useful for MSMEs. Individual suppliers can attend the Certification of Competencies in Public Procurement Programme.

The Korean Public Procurement Training Institute offers five contracting and management courses for suppliers on goods and services, public works, foreign goods, government goods management, and national properties management. Since the COVID-19 crisis, the Public Procurement Training Institute started conducting e-learning courses so that trainees could take the courses without restriction of time and location (Figure 2) (Public Procurement Service, 2021).

Box 5: Large-Small Business Cooperation Programme in Korea

The Public Procurement Service introduced a cooperation programme between MSMEs and larger enterprises engaging in public construction to strengthen and promote MSMEs' capacity and growth. Large enterprises, as mentors, provide MSMEs with management guidelines, construction techniques, financial management, and business strategies. To incentivize large enterprises to participate in such programme, additional points are given in pre-qualification process, priority in single sourcing technical bids, awards issued by the Public Procurement Service Administrator. The Public Procurement Service also plans to evaluate the growth performance of MSMEs receiving support and link the results more closely to the incentives for large enterprises.

Sources: (Public Procurement Service, 2017) (Public Procurement Service, 2020) Large-Small Business Cooperation Programme https://www.pps.go.kr/kor/content.do?key=01179

Apart from offering specific payment terms, the Public Procurement Service of Korea set up a Network Loan Programme and partnered with 10 commercial banks that offer low interest loans to MSMEs who are engaging in public procurement contracts. These MSMEs can borrow up to 80 per cent of the contract amount solely based on the contract without any lien. The Public Procurement Service provides security to the banks and directly repays the loan at the end of the procurement contract. In 2017, the programme facilitated as many as 13 000 loans of more than US$ 400 million (OECD, 2018).

To assist MSMEs' innovative products in penetrating in the public procurement market in the Republic of Korea, the Ministry of Science and ICT implemented the Pre-certification of Public Purchase Procurement of Innovative Products Programme that allows MSMEs to produce and commercialize the outcomes of their research and development projects (Ministry of Science and ICT, 2021). The Public Procurement Service has been putting the government at the fore front as the first buyer (Public Procurement Service, 2020).

In terms of access to public procurement markets, the Korean Public Procurement Service organizes Korea Public Procurement Expo (KOPPEX) annually to assist MSMEs to connect with their potential buyers from

[23] Trainings for suppliers https://capacitacion.chilecompra.cl/mod/page/view.php?id=9868

both domestic and overseas public procurement markets (Public Procurement Service, 2021). It set up the G-PASS Association in 2016 to provide support to MSMEs, including preparing for bids, exploring new markets, offering information in public tenders and G-PASS Certification Programme (Public Procurement Service, 2016). MSMEs who are registered in the KONEPS and have more than one contract or delivery performance during the past three years can apply to be a G-PASS Company. Becoming a G-PASS Company means their technical skills and reliability is recognized by the Public Procurement Service who will provide support to explore overseas procurement markets. The Public Procurement Service also trains marketing professionals for the overseas procurement market and hires them afterwards. Since 2019, 191 global marketing specialists who specially provide support to MSMEs have been trained[24].

3.5. Available technological infrastructure

Digitalization of public services has been increasing across countries and regions and electronic procurement, or known as e-procurement, is usually part of the digital government strategy and is increasingly considered as contributing to e-formalization that facilitates transition to formality (Kring and Leung, 2021) (Kring and Elder, 2022).

The digital portal of ChileCompra (https://www.chilecompra.cl/) brings together all information about public procurement, from the laws, regulations and procedures on public procurement, digital public market, trainings and detailed data about public procurement contracts. In the digital public market, called "Mercado Público" in Spanish (https://www.mercadopublico.cl/), MSMEs can easily register themselves as suppliers. They can browse all tenders and filter them by more specific criteria, such as, geographic location, size of contract and submitting bids. The "Mercado Público" is one of the largest e-commerce platforms in Chile as over 850 public buyers and thousands of suppliers registered (ILO, 2021).

In 2002, the Korean Public Procurement Service launched the KONEPS (https://www.g2b.go.kr/) as the national comprehensive e-procurement system that covers the entire procurement cycle and procedures electronically, including supplier registration, tender notice, bid submission, contract request, contract management and payment, and all related documents are exchanged online. Between 2018 and 2021, 97 per cent of registered suppliers are MSMEs[25]. All public procuring entities are required to submit and tenders through KONEPS and information is provided on a real-time basis (OECD, 2016b).

3.6. Impact, results and evidence in the Republic of Korea and Chile

The results on MSMEs' participation in public procurement are positive in the Republic of Korea and Chile. In terms of the share of public procurement contracts in the Republic of Korea, over 85 per cent of contract were awarded to MSMEs between 2017 and 2021[26]. In Chile, almost eight million of public procurement contracts were issued between 2018 and 2021 and MSMEs won 98 per cent of them (Ministry of Finance, 2021).

According to the Korean Public Procurement Service, over 75 per cent of the total public purchasing value went to MSMEs between 2017 and 2021 and MSMEs' sales value for the public market has increased significantly in absolute terms from KRW 92.2 trillion to KRW 119.7 trillion and went beyond the pre-defined target. In Chile, MSMEs' share of the total public purchasing value represents more than half of the value with a steady increase between 2017 and 2020 and then with a decrease of 7 percentage points between 2020 and 2021. However, the purchasing value from MSMEs in absolute terms has been increasing since 2019 (Table 2).

[24] Public Procurement Service helps firms eyeing overseas procurement market https://www.koreaherald.com/view.php?ud=20221125000077
[25] Statistics about KONEPS https://www.pps.go.kr/kor/content.do?key=00167#none
[26] Statistics on the purchasing orders https://www.pps.go.kr/kor/content.do?key=00164#none

Table 2: MSMEs' participation in public procurement

	2017	2018	2019	2020	2021
Republic of Korea					
Share of total purchasing value	74.7%	76.2%	77.8%	79.8%	77.6%
Target purchasing value from MSMEs (US$ billion)	65.2	68	71	78.3	85.9
Purchasing value from MSMEs (US$ billion)	69.8	71.2	79.5	88.1	90.6
Chile					
Share of total purchasing value	N/A	53%	55%	58.5%	51.5%
Purchasing value from MSMEs (US$ billion)	N/A	6,9	6,4	7,3	7,7

Source: (Ministry of SMEs and Startups, 2022) (Ministry of Finance, 2021)

Apart from the data published by governments, some existing impact evaluation studies also show the effects of a particular policy intervention in the public procurement cycle and process on MSMEs growth and transition to formality. In the Republic of Korea, a study (Chang, 2017) examines the effects of public procurement on the productivity and survivability of MSMEs and finds that participating enterprises in the mining and manufacturing sectors show higher productivity than non-participating ones for the year of participation in public procurement but exhibit significantly lower productivity after two years. They are also more likely to survive than those that did not participate in public procurement after two years. One possible explanation provided is that those participating enterprises choose the option of depending on the procurement market and surviving without increasing their productivity to the level demanded by the private market.

Another study looks at the unique auction mechanism in the Republic of Korea where contracts are randomly allocated among participating enterprises in public procurement and finds that a short-term contract induces long-term changes in the winning enterprise's growth, especially among small, young, and financially constrained enterprises. Their performance in private operations also grows because of the opportunities of building reputation in private markets, learning-by-doing and overcoming financial constraints through carrying out the public procurement contracts (Munseob, 2021).

In Chile, the Entrepreneurship Centre of ChileCompra, called "Centros de Emprendimiento ChileCompra" in Spanish, provides training to entrepreneurs in business plan development, financing, and taxation to enable greater participation amongst microenterprises in the public procurement market. An impact evaluation study finds that this initiative resulted in an increased share of public procurement contracts going to microenterprises at the national level, but that results were uneven at the local level. This is country specific because businesses concentrate in the capital city in Santiago (Contreras and Greenlee, 2018).

4. Lessons learnt and recommendations

Informality and poor growth of MSMEs are persistent in many African countries and finding ways to break the vicious cycle becomes more important than ever. Public procurement as part of public investment can provide incentive for formalization of MSMEs and help them growth and create jobs given its considerable size in public spendings. To maximize its potential, making it more strategic towards MSMEs growth for formal job creation and transition to formality for inclusive development becomes the objective for policymakers and development practitioners. Some lessons learnt and recommendations are identified following the success stories of the Republic of Korea and Chile.

From the beginning, it requires a good understanding of the root causes of informality and poor growth of MSMEs so that the role of public procurement can be clearly defined as part of the incentive package in the formalization and MSMEs development strategy and policy. With this recognition, the integrated public procurement system is designed and implemented to remove barriers for MSMEs' participation in public procurement considering governance, political, legal, institutional, and technological factors.

Setting targets on the outcomes of public procurement system to meet the objectives of MSMEs' inclusion and formalization ensures the translation of policy goal into reality. These outcomes can be achieved through adjustment of public procurement procedures considering specific barriers MSMEs face and creating a level playing field for equal access between MSMEs and large enterprises. These targets and data related to MSMEs should be made available to the public for transparency and building trust in public institutions. More importantly, it allows keeping tracking and monitoring of MSMEs' participation in public procurement.

Linking eligibility to become suppliers with MSMEs' formalization must be complemented by other targeted measure to avoid exclusion. MSMEs represent a category of enterprises that are at different stages along the transition to formality spectrum. The requirement of being a formal business first in order to register as suppliers is an effective push to get those who are ready to formalize. However, another pathway needs to be created to help those who are further away from formality to survive, grow and gradually move towards formalization.

Balancing the benefits of engaging in public procurement contracts and the side effect of dependency on public procurement needs to be carefully managed. To avoid the productivity trap, policy measures need to help MSMEs grow beyond the domestic public procurement market and connecting them to the overseas public procurement markets to achieve sustainable growth.

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Circular economy: Industrial symbiosis between fly ash waste from coal fired power stations and construction sector value chain. Opportunities for employment-intensive investment programmes in the Waterberg district of South Africa

Joseph Njogu Muturi

07

Circular economy: Industrial symbiosis between fly ash waste from coal fired power stations and construction sector value chain. Opportunities for employment-intensive investment programmes in the Waterberg district of South Africa

Joseph Njogu Muturi

Sub-theme: Innovations in employment intensive technology, approach and work methods relating to the development of rural and urban infrastructure

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Joseph N. Muturi is an experienced Technical Advisor with a specialisation in development finance, agribusiness and investment promotion. He has been integral in teams as an Infrastructure Public Finance specialist in the Infrastructure Support Programme Phase 1 and 2 of the Government Technical Advisory Centre (South African National Treasury) catering to infrastructure delivery management across all spheres of government in South Africa. Joseph has had broad exposure on socio-economic issues and their impact on entrepreneurial development, and local economic development for JSE listed entities, private investors, international organisations, and African private equity entities in the infrastructure and agribusiness sectors. He has led and managed teams in numerous industry studies, including analyses of the mass grocery, motor body repair, poultry, and food & beverages manufacturing sectors for the South African National Department of Trade, Industry and Competition, as well Sector Education Training Authorities. Currently, Joseph is a National Project Officer for the ILO: Limpopo Employment Intensive Investment Programme. Joseph possesses an MBA and a B. Comm degree in Accounting and Business Management (double major).

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CONTENTS

Abstract

Eskom supplies the bulk of South Africa's electricity through its mainly coal fired power stations. These power stations consume approximately 109 million tonnes of coal per annum, with 25 million tonnes of ash waste produced as a by-product annually *(1)*. The total output of a modern coal fired power station with a generation capacity of 3600MW consumes approximately 50,000 tonnes of coal daily, thereby generating around 20,000 tonnes of ash daily (85% comprises fly ash). In the Waterberg District Municipality, two power stations, namely Medupi (4800MW installed capacity *(2)*) and Matimba (3690 MW installed capacity *(2)*) are such coal fired power stations.

The fly ash generated by the two-coal fired powered stations in the Waterberg District constitutes solid waste. The emergence of circular economy business models that seek to harness by-products of manufacturing process and hence reduce waste in the environment opens avenues for enterprise development, employment and skills development, and industrial symbiosis in rejuvenating local economic development. The circular business model of design for recycling *(3)* provides an avenue for emerging construction manufacturers as fly ash has an embedded value that could be optimised in the construction sector value chain as labour intensive. Currently in South Africa about 10% of the fly ash is recycled.

Industrial symbiosis would thus see waste by-products such as fly ash become raw materials for community concrete pavement blocks and building bricks manufacturers *(4)* amongst others. This would open competition in the supply of building and construction materials in the public and private procurement markets for infrastructure development, thereby qualifying as labour intensive green works. Incorporation of fly ash in concrete products may reduce cement demand and result in sustainable costs of development of, for example, rural paved roads, water reservoirs and low-cost housing.

Circular economy concept has also contributed to policy and regulatory reform in South Africa with the promulgation of Section 18 Extended Producer Responsibility as part of the Waste Management Policy of South Africa, thereby creating a business opportunity.

In this context, we seek to identify the potential of fly ash reuse within the construction sector value chain through scalable public private partnerships (Eskom, mines, spheres of Government, Local communities/ businesses). This concept of circular economy will aid in the achievement of the sustainable development goals: 12- sustainable consumption and production; 8- decent work and economic growth; 6- energy; 11- sustainable cities; 13- climate change; 14- oceans; 15- life on land *(5)*.

1. Introduction: Fly ash recycling in the cement extension industry: Waterberg district area

South Africa's energy supply mix comprises 84% coal, 11% renewable energy, 3% natural gas, and 2% nuclear energy *(6)*. The domination of energy supply from coal fired power plants has in the mainstay made the country the world's 14th biggest greenhouse gas emitter *(7)*, mainly as an attribute of the country's energy system reliance on coal. Eskom supplies the bulk of South Africa's electricity through its mainly coal fired power stations. These power stations consume approximately 109 million tonnes of coal per annum, with 25 million tonnes of ash waste (85% comprises pulverized fuel ash/ fly ash) produced as a by-product annually *(1)*.

In the Waterberg District Municipality, two power stations, namely Medupi (4800MW installed capacity *(2)*) and Matimba (3690 MW installed capacity *(8)*) are such coal fired power stations. The emergence of circular economy business models that seek to harness by-products of manufacturing process and hence reduce waste in the environment opens avenues for enterprise development, employment and skills development, and industrial symbiosis in rejuvenating local economic development. This provides an avenue for emerging cement extension industry value chain as fly ash has an embedded value that could be optimised for its labour intensity. Industrial symbiosis would thus see waste by-products such as fly ash become raw materials for community concrete pavement blocks for rural roads and building bricks manufacturers *(4)* amongst others, thereby help address unemployment, poverty, and income inequality challenges in rural and township economies of the Limpopo Province: Waterberg District Area. Currently in South Africa about 10% of the fly ash is recycled.

2. Coal and its environmental impact

2.1. Coal production in South Africa

Globally, coal is the prevalent primary fuel for electricity production, constituting 36% of total fuel consumption. The largest coal using countries in the world include China, USA, India, Japan and South Africa (82% of total global coal use). Locally (South Africa), marketable coal mined is 224 million tonnes, hence South Africa is the fifth largest coal producer globally, with 25% of this production exported. Technological advancements in recent times have seen the diversity of coal use from electricity generation (53%) to petro-chemicals (33%- coal to liquids technology- Sasol), steel production (12%)- Arcelor-Mittal, domestic heating (2%) and economies of scope in brick making, cement, and lime calcining. Current coal reserves are estimated to be 53 billion tonnes, indicating a 200 year's coal supply at current production rates *(9)*. The figure below shows the coal fields of South Africa.

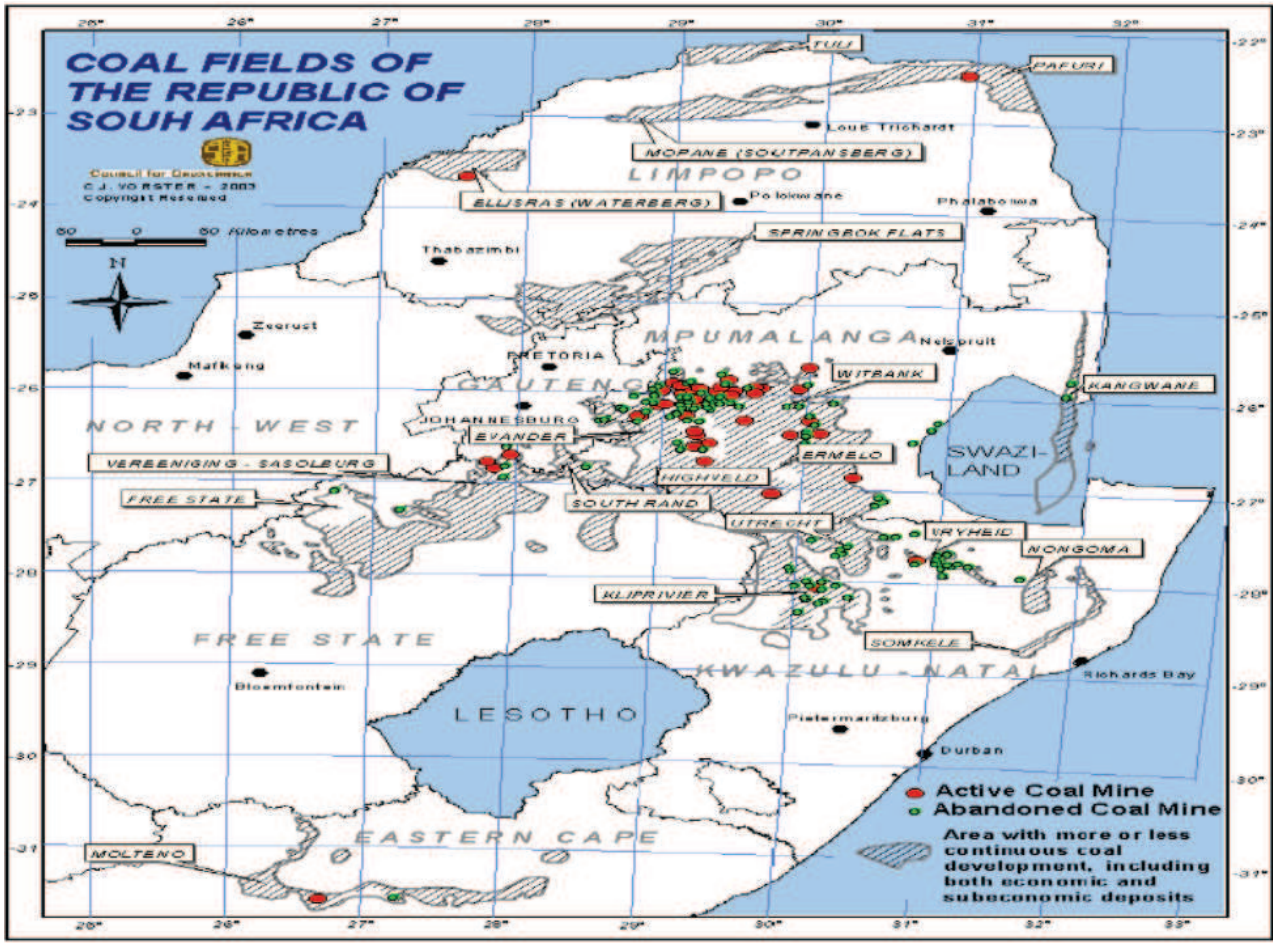

Figure 1: Coal fields of South Africa

Source: (9)

Electricity generation in South Africa is primarily undertaken through a state-owned utility called Eskom, consuming mainly coal for power generation through its coal fired power stations. The table below lists the coal fired power stations *(9)*.

Table 1: South Africa: Eskom Coal Fired Power Stations

Eskom Coal Fired Power Station	Installed Capacity	Province
Arnot Power Station	2100MW	Mpumalanga
Camden Power Station	1510MW	Mpumalanga
Duvha Power Station	3600MW	Mpumalanga
Grootvlei Power Station	1200MW	Mpumalanga
Hendrina Power Station	2000MW	Mpumalanga
Kendal Power Station	4116MW	Mpumalanga
Komati Power Station	1000MW	Mpumalanga
Kriel Power Station	3000MW	Mpumalanga
Kusile Power Station	4800MW	Mpumalanga
Lethabo Power Station	3708MW	Free State
Majuba Power Station	4110MW	Mpumalanga
Matimba Power Station	**3990MW**	**Limpopo**
Matla Power Station	3600MW	Mpumalanga
Medupi Power Station	**4800MW**	**Limpopo**
Tutuka Power Station	3654MW	Mpumalanga

Source: (9)

The installed capacity of electricity generation (supply) from coal shows high domestic demand for coal and its associated mining activity that poses environmental challenges in efforts to meet growing electricity demand for domestic and industrial use. Environmental degradation from coal mining and consumption includes air pollution from its combustion, and land degradation from its mining associated activities (10).

2.2. Environmental impact of coal

The increasing demand for electricity by domestic and industrial consumers and the country's heavy reliance on coal for electricity generation has a negative environmental impact across coals value chain from mining to beneficiation and utilisation. These negative environmental effects emanate from land use and transformation, air and water quality, biodiversity loss, soil degradation and human health (9).

Mining: two methodologies are used in coal extraction; open cast and underground. Open cast mining results in land alienation, acid mine drainage, erosion and silting of surface and groundwater affecting borehole yields. Underground mining enhances ground surface disturbance, dust/ fumes from mine vehicles and associated transport, as well as water contamination. Generally, once the useful life of mine is attained there is increased subsidence, slumping and flooding, acid mine drainage, and land use change. This has also seen the development of ash dams that are an environmental and health hazard in the areas and communities in which they are located (9). Environmental risk disasters from ash dams are a reality. Eskom Holdings in 2020, temporarily stopped operations at its Camden Power Plant due to the threat posed by its coal ash dam that could have burst and endangered the lives of local community residents (11).

Beneficiation: washing of coal results in formation of large waste dumps that are at high risk of spontaneous combustion and associated harmful gas emission pollution. In addition, the dump sites can potentially cause acid mine drainage in proximity to water systems (9).

Utilisation: coal fired power stations emit greenhouse gas emissions (carbon dioxide, nitrous oxide), high water consumption and pollutions, particulates, sulphur dioxide, nitrogen oxide, and ash generation. The disposal of ash also has environmental impacts when disposed in local streams or vacant land, necessitating leachate generation and its associated land pollution and water systems (9).

3. Policy and regulatory environment for coal fly ash beneficiation-waste exclusion

The policy and regulatory foundation for environmental management is anchored within The Constitution of the Republic of South Africa, 1996; The National Development Plan- Vision 2030; National Environmental Management Act, 1998 (Act No. 107 of 1998); National Waste Management Strategy 2020; Municipal Systems Act 2000 (Act No. 32 of 2000); National Domestic Waste Collection Standards 2009; and Industry Waste Management Plans. This policy and regulatory framework are aligned to South Africa's priorities, namely: Economic Transformation and job Creation; Education, Skills and Health; and A better Africa and World.

The National Waste Management Strategy 2020 within the context of the circular economy adopts key principles such as waste minimisation through the promotion of sustainable consumption and production; waste prevention; waste as a resource anchored on the industrial symbiosis concept; investment in sustainable strategic partnerships (Government, industry, civil society, academia) in waste management; environmental socio-economic growth and development. This approach strategically links with the Sustainable Development Goals and Vision 2030 (12).

Circular economy in the market systems development of coal fly ash (CFA) in cement extension has been enabled through a Government Gazette Notice No. 45293 that authorised the exclusion

of certain waste streams or portions of respective waste streams as being defined as waste. This opens opportunities for the former waste streams to be recycled for local beneficiation socio-economic activities but must still comply with risk management plans emanating from respective risk assessments.

CFA exclusions were approved for the circular construction value chain in road construction, brick making, and block making. Waste exclusions for application in Circular Construction were also given to mining by-products such as Ferromanganese Slag, Ferrochrome slag, Biomass-Fibre Sludge, Spent Foundry Sand, Brine Filter Cake/ sludge, Iron ore plant discard respectively (13). Circular economy business model has also contributed to policy and regulatory reform in South Africa with the promulgation of Section 18 Extended Producer Responsibility as part of the Waste Management Policy of South Africa, thereby creating a business opportunity for the recycling of fly ash waste by Eskom.

4. Global benchmarking: Fly ash use programme of India

4.1. India

In 1994, India instituted the Fly Ash Utilization Programme through the National Department of Science and Technology, Ministry of Power and Ministry of Environment and Forests to address the environmental and management challenges caused by fly ash waste in the country. The Programme has instituted technology demonstration projects (68) on use of fly ash for market system development of waste in various industries. These interventions have created intense demand for fly ash waste from 1 million tonnes per year in 1994 to over 65 million tonnes per year (14). This has been supported by policy and regulatory measures institutionalized through national standards, specifications and guidelines. South Africa, being a member of the Brazil, Russia, India, China and South Africa (BRICS) can harness learning curve effects and economically utilize its fly ash waste to address the triple challenge of unemployment, poverty and income inequalities in rural and township economies where coal fired power plants are in operation e.g., Medupi and Matimba Power Station in Limpopo Province (Waterberg District Area).

4.2. Germany

Structural transformation of economies and associated urbanisation developments have increased the demand for building sand in efforts to meet demand for construction materials. Currently 40 billion tonnes of sand are mined annually to meet this growing demand. This has seen increased mining of sand to meet the global demand with adverse environmental impacts on river systems and land degradation. Zaak Technologies GMBH (an integrated pilot plant in Grossbeeren, Germany) through an EU-funded initiative, has sought to use coal fly ash from coal-fired power stations and waste to energy incineration plants in Germany as a valuable replacement product to sand, thereby mitigating the overexploitation of sand as a natural resource.

This development offers opportunity for industrial symbiosis in the construction sector value chain within the circular economy. The EU-funded SMARTSAND project Lypors™, an advanced engineered, artificial sand material manufactured from fly ash for use in the construction industry. The circular economy construction product has been marketed as a sand replacement that is better quality and cost effective than natural sand, crushed stones, and lightweight fine aggregates that has an embedded value in the value chain of concrete, mortars, roof tiles, tile adhesives, facades etc, as well as applications within agribusiness value chains such as horticulture

and hydroponics (15). The pilot project has enabled the company to develop an award-winning patent pending technology that enables the production of waste CFA into lightweight engineered sand, called ZaaK™Sand, compliant with harmonized technical specifications DIN EN 4226-3, DIN EN 13139, and DIN EN 15033-1/2 (15).

Construction value chain benefits of the product include: 55% lighter than normal construction sand, better efficiency in building load distribution; five times thermal insulation capability; longer asset lifecycle. All these circular economy benefits result in value chain cost savings in transport and fuel, while enabling low carbon infrastructure development. The intellectual property developed offers opportunity for small, medium enterprise development for industrial "Smart Sand" plants globally, that offers lower adverse environmental footprints while stimulating employment, innovation and enterprise development in industrial symbiosis within the circular economy (15).

5. Circular economy potential: Eskom coal fly ash

5.1. Circularity potential of the cement extension industry utilising industrial fly ash waste from Medupi/Matimba coal fired power station

Unemployment in South Africa stands at 32.9%, the third highest in the world (16). Poverty and inequality are further attributes of the unemployment crisis. The Government of South Africa has embarked on programmes such as the Expanded Public Works Programme (EPWP- 4th Phase) whose objective is to provide work opportunities and income support to poor and unemployed people through labour-intensive methods. EPWP beneficiaries are thus utilized in the delivery of public and community assets and services, thereby contributing to development. The EPWP operates in four sectors namely the Infrastructure, Environment and Culture, Social and Non-State Sectors with the International Labour Organization providing technical assistance. The Limpopo Department of Public Works, Roads and Infrastructure (LDPWRI) coordinates the programme in the province. One of the challenges of the EPWP has been an exit strategy for beneficiaries to access decent work on expiry of their EPWP contracts, and thereby sustainably mitigate the triple challenge of unemployment, poverty and income inequality in rural and township economies. The circularity concept offers an opportunity to harness employment and enterprise development within the identified cement extension industry using the fly ash waste from Medupi and Matimba Coal Fired Power Station.

5.2. Rethinking of fly ash waste - Eskom linear to circular business model

Historically the dominant business model of Eskom has been linear through the purchase of extracted coal, its burning to generate electricity, and its waste into ash dams. The amount of ash waste going into ash dams could be minimized through rethinking of the ash waste, especially the fly ash that has an embedded value. The embedded value is in the use of the fly ash in cement extension, within the construction sector, and therein the construction materials industry as a derivative of minimizing the use of cement and associated extractive clinker in cement production. The rethinking of the ash waste can also be deciphered from the waste lifecycle of the fly ash that is dumped in ash dams, and which has an intrinsic value in the cement extension value chain, and therefore a waste of resource.

South Africa through its commitment to the Paris Agreement has seen Eskom proactively engaging in ash management. This has seen the development of industry driven Extended Producer Responsibility (EPR) (Section 18 Extended Producer Responsibility as part of the Waste Management Policy of South Africa) by Eskom in supporting the adoption and lifecycle recycling of fly ash and other ash waste by products from its coal fired power stations.

5.3. Industrial symbiosis: Energy-mining (coal, clinker-cement), construction sector

Circularity of product lifecycles has also seen the growth of industrial symbiosis. The symbiotic relationship between the mining sector (coal extraction), energy sector (coal fired power stations), and construction sector (cement-based building material manufacturers) can be capitalized for cement extension industry interventions in the built environment value chain through circular construction, circular procurement, and market system development for small and medium enterprises within the Limpopo Province and Waterberg District area. They would be using fly ash from the Medupi and Matimba Power Station. The value chain clustering and market system development for small and medium enterprises in cement extension industry-based building products within the Limpopo Province and Waterberg District area would be harnessed as a viable EPWP exit strategy for EPWP beneficiaries on lapsing of their contracts, especially those in the infrastructure sector through spatial socio-economic models such as the District Development Model and Cottage Industrial Parks per district.

5.4. Circular business drivers for cement extension industry

The circular business drivers for industrial symbiosis (collaboration and value chain clustering) of the mining, energy, and construction sectors include:

- Government regulation determining the non-hazardous nature of the fly ash originating from the Coal fired power stations (17). This declaration has made the fly ash waste from the stations given a waste exclusion, and suitable for recycling thereby harness its embedded value.
- Government regulation (public procurement), local content designation, sub-contracting (30%) local small, medium and micro enterprises within the public infrastructure deployment areas will provide sustainable avenues to develop these enterprises and associated skills development.
- Eskom incentivized sale of fly ash for recycling in the cement building products industry through subsidized prices (lower prices relative to the cement price for cement extending).
- Reduce the costs of production of cement-based building products as well as energy costs associated with cement production, given the qualities of fly ash as a cement extender.
- Cement extension using fly ash waste can generate green works and climate proof infrastructure through high resistance to alkali-silica reaction, superior acid resistance, high resistance to fire, low carbonation, high durability performance than normal concrete (18). This therefore enables the climate proofing of infrastructure.
- Immense potential to generate low skilled green jobs in rural and township economies in Limpopo as evidenced in the market system development of fly ash recycling in India (proof of concept). This would be a perfect fit for EPWP beneficiaries exiting the programme.
- Increased demand for fly ash reuse will reduce the environmental pollution footprint of ash dams through enhanced raw material efficiency of the coal-energy value chain.

- Demand for infrastructure in public sphere (Municipal Infrastructure Grant that mainly targets township roads that utilise concrete paving blocks- Medium Term Expenditure Framework Allocations 2022/23- R1.9 billion/ 2023/24 R2billion/ 2024/25 R 2.098billion (19), Human Settlements Development Grant through the Reconstruction and Development Programme- Medium Term Expenditure Framework Allocations 2022/23- R1.288 billion/ 2023/24 R1.343billion/ 2024/25 R 1.399billion (20)), and private sphere (private home development and improvement).
- Align public and global expectations on South African alignment to the Paris declaration and its National Determined Contributor.

5.5. Circular procurement: Cement extension industry

Cement extension industry circular business model would see fly ash become raw materials in rural and township economies where government infrastructure programme is mainly targeted to address the historical challenges of apartheid. This would open competition in the supply of building and construction materials in the public and private procurement markets for infrastructure development, thereby qualifying as labour intensive green works. Incorporation of fly ash in concrete products may reduce cement (clinker) demand and result in sustainable costs of infrastructure development e.g., rural paved roads, water reservoirs and low-cost housing.

5.6. Stakeholder analysis cement extension industry circular economy

In this context, utilising the potential of fly ash reuse within the cement extension industry value chain through scalable public private partnerships (Eskom, mines, spheres of Government, Local communities/ businesses) that stimulate social dialogue as promoted by the International Labour Organisation utilising EPWP beneficiaries exiting the public employment programme.

Table 2: Stakeholder analysis: Cement extension industry circular economy

Category of stakeholders	Stakeholder and stakeholder strategy	Roles & responsibilities
Civil Society	International Labour Organisation (ILO): Decent Work Team: Expanded Public Works Programme- Limpopo	• Technical advisory role in circular economy development, public employment programmes, market system development, standards, specifications and guidelines. • Offer small and medium enterprises in the cement extension value chain training- Start and Improve Your Business (SIYB), Improve Your Business (IYB). • Assist in social dialogue among cement extension value chain
	Impact Catalyst (Anglo American, Exarro, Council for Scientific and Industrial Research- CSIR, World Vision, Industrial Development Corporation- IDC- **Manage closely**	• Public private partnership representing employers wishing to partner to scalable initiatives aimed at systemic socio-economic impact e.g., cement extension industry value chain businesses and cooperatives • Corporate social responsibility through EPR • Funding partners
	South African Coal Ash Association- **Manage closely**	• Organization representing ash producers and marketers in South Africa
Government	National Department of Environmental Affairs, Forestry and Fisheries- **Keep satisfied**	• Policy and regulation of waste (fly ash) and extended producer responsibility
	Limpopo Department of Public Works: **EPWP Chief Directorate- Manage closely**	• Communication focal point with LCOGHSTA. • ILO focal point of communication.

Category of stakeholders	Stakeholder and stakeholder strategy	Roles & responsibilities
		• Steward of EPWP implementation in the province.
	Agrément South Africa- **Keep satisfied**	• Certify fit for purpose construction products, systems, materials outside the scope of SANS Standards or codes of practice
	Limpopo Department of Cooperative Governance, Human Settlements, & Traditional Affairs (LCOGHSTA): **Branch: Integrated Sustainable Human Settlements- Manage closely**	• Recipient of the Human Settlements Development Grant, and its implementer in the province. • Steward of EPWP implementation within the Human Settlements sub-sector.
	Housing Development Agency (HDA)- **Inform regularly**	Implementing Agent of sustainable human settlements, critical player in the province value chain.
	National Home Builders Registration Council (NHBRC)- **Manage closely**	Regulatory body of the home building industry, providing quality assurance on the performance of home contractors in the provincial value chain.
	Construction Industry Development Board (cidb)- **Manage closely**	grader and developer of contractors in the construction industry value chain.
	Social Housing Regulatory Authority (the"SHRA")- **Manage closely**	Regulatory and investment authority for affordable rental homes, hence a key player on the value chain of the sub-sector.
	National Housing Finance Corporation (NHFC)- **Keep satisfied**	Mandated to develop models on affordable housing for the low- and middle-income target market, hence key financier in the sub-sector value chain.
	Council for the Built Environment (CBE) – skills advisory group- **Monitor and anticipate needs**	• Empowerment and economic development of built environment professionals in the sub sector. • Professional skills and capacity development in the sub sector.
	CETA or any relevant SETA- sector skills council- **Manage closely**	• Identification of industry vocational skills required in the cement extension industry value chain

Category of stakeholders	Stakeholder and stakeholder strategy	Roles & responsibilities
		• Training Quality Assurance • Identification of viable vocational training service providers
	Training Service Providers- **Inform regularly**	Provision of Training Services
	Local Municipalities: Local Economic Development Sector Departments – EPWP exit beneficiaries- **Manage closely**	• Assist in beneficiary selection • Identification of database registered construction sector businesses in the Waterberg District Area
	Lephalale TVET- **Manage closely**	• Hub of vocational training of skills identified in the cement extension industry value chain within the Waterberg District Area
Employees	Building, Construction and Allied Workers' Union (BCAWU) - **Keep satisfied**	• trade union representing workers in the construction industry in South Africa • monitor occupational health and safety
	Amalgamated Union of Building Trade Workers of South Africa (AUBTWSA) - **Keep satisfied**	• trade union representing workers in the construction industry in South Africa • monitor occupational health and safety
Employers	Business Unity South Africa- **Monitor and anticipate needs**	• unified organization representing business in South Africa • unisectoral membership by Master Builders South Africa and South African Property Owners Association who are vital in market systems development of cement extension industry value chain
	Cement producers- Association of cementitious material producers, Cement and Concrete South Africa- **Manage closely**	• cement producers in South Africa who can market develop scalable purchase of fly ash to produce pozzolana cement

5.7. Inclusion of women, youth and vulnerable groups in cement extension value chain

Inclusion of equity consideration in EPWP exit strategy for beneficiaries will align with the EPWP beneficiary framework of 60% women, 55% youth, and 2% persons with disability within the Limpopo Province Waterberg District Area targeted. Key considerations will include:

- EPWP beneficiary exit strategy aligned to the residence of the targeted beneficiaries in the rural and township areas of the Waterberg District area catering to the demographic targets as set out in the Limpopo Province EPWP framework. For small and medium enterprise development they could be organized in a coalition of the willing through local community builder cooperatives for development of cottage industries.
- Skills identification and needs of operationalizing the fly ash recycling concept within cement product building materials at local community, industry level and by occupation around the Waterberg District Area.
- Harness collaborative partnerships for skills in the fly ash recycling circular economy with key stakeholder groups such as Council for Built Environment (skills advisory group), CETA (Sector skills council) and Corporate Social Investment of the Impact Catalyst within the Waterberg District Area.
- Institutionalize just transition within the circular economy model of fly ash recycling by identifying job opportunities, raising job standards, reduction of income inequalities among sectoral fly ash beneficiaries.

5.8. Expected results of the construction building material sectoral circular economy intervention

The circular economy sectoral intervention of fly ash recycling in cement extension will enable and enhance the achievement of:

- Enhance and institutionalize (formalize) circularity regulations on the waste management of fly ash recycling within the cement extension industry of the construction sector (from industry driven to government driven as part of EPR).
- Labour intensity potential of fly ash recycling within the cement extension industry that will create opportunities for job creation, job substitution, job transformation/ redefinition within the cement product value chain in Limpopo Province, especially for exiting EPWP beneficiaries.
- Formalize informal micro and small enterprises in the construction sector through collaboration and value chain clustering.
- Green works/ jobs transformation of local economic development and associated decent work in the construction sector value chains in Limpopo Province.
- Green jobs/ works contribute to enhanced energy and raw material efficiency in the industrial symbiosis of the mining (coal and clinker extraction)- energy (coal fired power stations)- construction sectors (cement extension industry), thereby environmentally sustainable jobs.

6. Socio-economic potential of coal fly ash use in construction sector value chains in Africa

TCFA is being traded as a commodity. The top three global exporters are India, Vietnam, and South Korea in descending order respectively (21). Demand is global for the commodity especially as the world embraces its circularity and its growing qualities as a cost-effective cement extender. In the African context, CFA has been exported by South Africa to Lesotho where cement blends of up to 40% CFA were used in building the Katse Dam, which is the principal dam of the Lesotho Highlands Water Scheme, which supplies South Africa's Gauteng Province daily water needs (22).

The signing of the African Continental Free Trade Area agreement as one of the flagship projects of Agenda 2063 offers opportunities for the increased usage of circular construction through the export of CFA by South Africa to other African economies where it can stimulate small and medium enterprises within the respective construction sector value chains. This will promote migration of the many informal building manufacturers across Africa to formal enterprises and thereby enhance job quality of their employees.

7. Findings and Conclusion

The circularity concept adoption within construction sector value chains of CFA waste is noted in Table 3.

Table 3: Findings and Conclusions

Seminar- Themes	Finding	Conclusion
Sub- Theme- Innovations in employment intensive technology, approach and work methods relating to the development of rural and urban infrastructure	Growing public infrastructure backlog and financing gaps e.g., South Africa ZAR 21.5 trillion; socio-economic challenges of inequality, poverty, and unemployment, call for labour intensive investment innovations in infrastructure development.	CFA industrial symbiosis use in alternative construction materials offer cost effective approaches to reduce per capita cost of public infrastructure while stimulating employment, enterprise development and training in the respective value chains. This will be aligned to the circular economy and achievement of SDG 8 on decent work and economic growth.
Sub- Theme- Environmental stewardship, ecosystem restoration and climate-proofing of public assets to enhance climate change adaptation	Reduced carbon footprint in construction value chains (clinker mining, cement production carbon footprint, logistics carbon footprint, energy carbon footprint, sand harvesting) will result in low carbon infrastructure, as well as mitigate amount of ash dams and ash dam disaster. In addition, the physical enhanced properties of infrastructure utilising coal fly ash as raw materials have increased asset life cycles, thereby reducing the infrastructure carbon footprint, and maintenance costs.	Industrial symbiosis of CFA use in the infrastructure sector will enable the progression to attain the SDG of 9- industry, innovation and infrastructure; 12- responsible consumption; 13- Climate Action.
Sub- Theme- Local beneficiation through the promotion of alternative and environmentally friendly local construction materials, eco-construction and knowledge	Waterberg District being a major energy hub of South Africa through its developed coal fired power plants will see local utilisation of coal fly ash waste generated therefrom in the development of local construction materials derived thereof; within the ambit of circular economy and associated industrial symbiosis. Supply derived from the alternative local construction materials will be utilised in meeting the growing demand for rural infrastructure within the Province, and Nationally too.	CFA beneficiation within the Industrial Symbiosis concept of the circular economy offers avenues for economies of scope within alternative construction materials value chains and small, medium enterprise development. This will aid attain SDG 8- decent work and economic growth; 9- industry, innovation and infrastructure; 10- reduced inequalities; 11- sustainable cities and communities; 12- responsible consumption; 17- partnership for the Goals.
Sub- Theme- Creating a sustainable local contracting industry through systematic capacity development interventions	Public Employment Programmes such as the Expanded Public Works Programme with a key sector being Infrastructure, offer exit strategies for EPWP beneficiaries in training and development of Small and Medium Enterprises within opportunities offered by circular economy industrial symbiosis of CFA waste within construction sector value chains. Local brick and paving manufacturing businesses.	Onboarding market systems development approach to circular economy industrial symbiosis of beneficiating CFA within constriction sector value chain materials aligned to public infrastructure projects in rural areas will match demand and supply. This will offer opportunities to grow

Seminar- Themes	Finding	Conclusion
		local contracting in infrastructure development as espoused in public procurement of infrastructure in South Africa.
Sub- Theme- Fostering the transition of workers and economic units from the informal to the formal economy	Opportunities offered by circular economy industrial symbiosis of CFA should anchor EPWP beneficiaries in the infrastructure sector and local brick and paving informal businesses to enhance their job quality. This will enhance their progression from the informal to formal economy.	CFA circular economy industrial symbiosis will enhance the progression to attain SDG 8- decent work and economic growth; 10- reduced inequalities.
Main Theme- Promoting skills and productive (decent) jobs for our common better future	Harnessing economies of scope offered by CFA within circular economy fundamentals in the construction sector value chains will enable the promotion of decent jobs and enhance job quality through the innovative alternative construction materials segment.	Adopting and developing market systems development of CFA beneficiation offers opportunities for EPWP beneficiary exit strategies through training and enterprise development. This will aid the progression to SDG 8- decent work and economic growth; 10- reduced inequalities.

8. Recommendations on industrial symbiosis applications of coal fly ash use for labour-based practitioners in the infrastructure sector

Recommendations identified for circularity potential are documented in Table 4.

Table 4: Proposed recommendations on CFA circularity in construction sector value chains

Theme	Recommendation
Sub- Theme- Innovations in employment intensive technology, approach and work methods relating to the development of rural and urban infrastructure	Institutionalise circular economy/ procurement in public infrastructure development through relevant public procurement policy. This will further stimulate demand for CFA circular economy industrial symbiosis in the construction sector value chains.
Sub- Theme- Environmental stewardship, ecosystem restoration and climate-proofing of public assets to enhance climate change adaptation	Enable and enhance circular procurement in the National public procurement frameworks. This will enhance circular procurement behaviour in industry where Government is the largest single procurer of goods and services in an economy.
Sub- Theme- Local beneficiation through the promotion of alternative and environmentally friendly local construction materials, eco-construction and knowledge	Stimulate, enact policy and regulatory frameworks that speak to regulations, laws, standards on the use, adoption, and risk management of alternative and environmentally friendly local construction materials, eco-construction and knowledge in circular economy and circular procurement.
Sub- Theme- Creating a sustainable local contracting industry through systematic capacity development interventions	Enhance accredited training programmes and associated funding in public infrastructure projects for EPWP beneficiaries to foster more effective EPWP exit strategies aligned to better job quality and enterprise development readiness.
Sub- Theme- Fostering the transition of workers and economic units from the informal to the formal economy	Tracer studies on the effectiveness of EPWP beneficiaries to transition from informal to formal economy within the construction sector value chains, as suitable tools to inform future EPWP and associated training therein.
Main Theme- Promoting skills and productive (decent) jobs for our common better future	Promote innovative approaches the circularity concept offers to stimulating job quality, decent work and economic growth, as well as income inequalities within emerging alternative construction materials derived from industrial waste, especially in the mining sector e.g., CFA. This will enable harnessing of economies of scale and scope therein. Study tours to Germany and India will be fundamental in identifying best practice and learning curve effects in CFA circularity in construction sector value chains.

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I would like to thank the International Labour Organisation and my colleagues at the International Labour Organisation Employment Intensive Investment Programme Limpopo; Limpopo Department of Public Works, Roads and Infrastructure for the opportunity and interactions when conceptualising and developing the circular economy nexus with the construction value chain in Limpopo, with particular emphasis to local beneficiation of coal fly ash from the Waterberg District area of the Province.

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Notes

Cadres politiques, législatifs et institutionnels habilitants pour la promotion de programmes publics d'emploi inclusifs et de travaux écologiques dans les secteurs riches en emplois

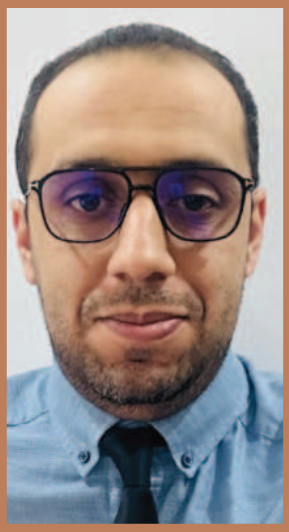
Mohamed Wael Ben Ameur

08

Cadres politiques, législatifs et institutionnels habilitants pour la promotion de programmes publics d'emploi inclusifs et de travaux écologiques dans les secteurs riches en emplois

Mohamed Wael Ben Ameur

About the author



Mohamed Wael Ben Ameur, sous Directeur-Inspecteur central des services financiers au ministère des finances Tunisien de 2013 à 2021, Chargé Administratif et financier du projet Initiative Pilote pour un Développement local intégré (OIT) depuis 2021.

Diplômé en 3ème cycle spécialisé en finances publiques de l'Institut d'Economie douanière et fiscale Tuniso-Algérien nommé comme représentant du ministère des finances au comité national de suivi des rapports sur la compétitivité et des notations à l'ITCEQ, au comité de suivi de la stratégie nationale bas carbone (SNBC) au ministère de l'énergie, au groupe de travail sur l'amélioration des performances fiscales des communes, et membre de la commission de la réforme fiscale (Assises nationales de la fiscalité - Groupe de travail sur la fiscalité locale).

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Contents

Liste des Abréviations, Sigles et Acronymes

ANPE Agence nationale de protection de l'environnement
ARRU Agence de Réhabilitation et de Rénovation Urbaine
CCL Code des collectivités locales
CDC Caisse de dépôt et de consignation
CFAD Centre de Formation et d'Appui à la Décentralisation
CGDR Commissariat général au développement régional
CPSCL Caisse des Prêts et de Soutien des Collectivités Locales
IDE Investissement Direct étranger
IDR Indice de développement régional
INS Institut national de la Statistique
IPDLI Initiative pilote pour un développement local intégré
IPAPD Instance Générale de Prospection et d'Accompagnement de Processus Décentralisé
ITCEQ Institut Tunisien de la Compétitivité et des Etudes Quantitatives
PDI Programme de développement intégré
PIB Produit Intérieur Brut
PME Petites et moyennes entreprises
PPP Partenariat Public Privé
PRD Programme régional de développement

Abstract

Dans une conjoncture économique mondiale difficile impactée par les répercussions d'une crise sanitaire sans précédent et aggravée par la guerre russo-ukrainienne, les finances publiques et locales n'ont pas pu échapper à la crise.

Une flambée des prix des matériaux, une inflation galopante et une baisse du rythme de l'investissement public doivent mener les décideurs à une nouvelle réflexion sur les modalités de financement des programmes d'investissement. Les collectivités locales, premier vis-à-vis des citoyens dans la fourniture des services et des infrastructures de base doivent être au cœur de cette réflexion.

En Tunisie, les sources de financement des collectivités locales sont multiples. Entre dotations et appui budgétaire de l'Etat, l'accès au marché financiers (Emprunts) et la fiscalité propre et transférée, ces entités locales doivent trouver une formule adéquate afin d'assurer une gestion financière saine et garantir la réalisation de leurs plans d'investissement.

Pour y arriver un outil indispensable doit être mis en œuvre par les communes, il s'agit de développer le partenariat public privé pour le financement des projets d'infrastructure.
Le PPP qui s'impose comme un outil complémentaire de réalisation de l'investissement public peut constituer l'arme la plus efficace pour assurer la rentabilité et la viabilité des projets d'infrastructure.

Un cadre légal définissant les formes des PPP, garantissant la rentabilité des projets et conservant à la fois les intérêts de la commune, du secteur privé et de l'usager est un exercice que la Tunisie

a réussi et qui concrétise même des objectifs d'intervention des projets mis en œuvre par l'OIT à savoir :
(a) favoriser la participation des PME locales;
(b) le recours à la main d'œuvre locale;
(c) Valoriser les technologies communautaires et les substances utiles locales;

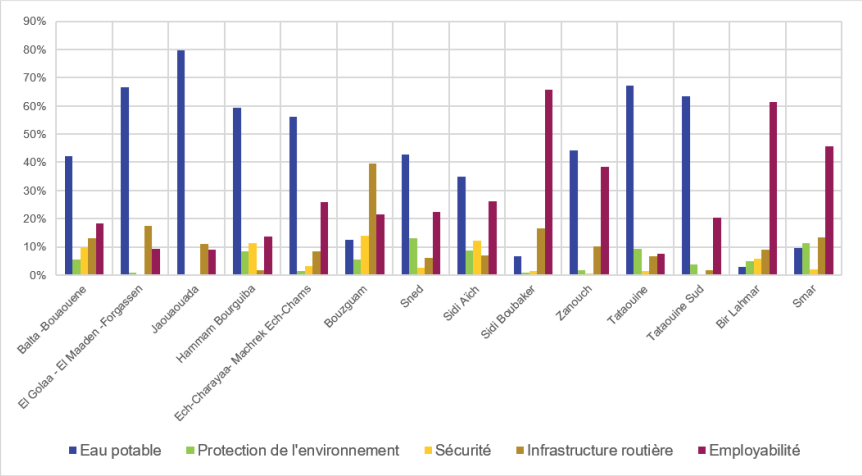
Bénéficier de la capacité de financement, de conception, d'exécution, de maintenance et du savoir-faire du secteur privé ne peut être que bénéfique pour les collectivités territoriales afin de combler le déficit en infrastructure publique d'une manière efficace et efficiente.

Le recours au PPP doit également s'accompagner par un effort supplémentaire visant à :
1) Parvenir à une harmonisation interventions publiques notamment les liaisons entre les programmes communaux, programmes spécifiques et programmes sectorielles,
2) Développer le potentiel fiscal des communes permettant une dynamisation de leurs ressources propres et assurant ainsi la couverture d'une large partie des dépenses de fonctionnement.
3) Repenser le système d'affectation des fonds entre les communes afin de faire face aux disparités et appuyer les communes défavorisées.
4) Rentabiliser les crédits octroyés via une orientation des enveloppes vers des investissements à forte valeur ajoutée économique et sociale.

1. Contexte général

Parmi les entraves au développement socio-économique des populations, l'accès limité aux services et équipements de base. Ce phénomène s'accentue dans les milieux ruraux où une large partie des habitants souffre d'une isolation nécessitant un effort énorme de la part des autorités locales afin d'assurer le désenclavement, la fourniture d'un service de base adéquat menant vers une amélioration des conditions de vie et une création d'emploi.

Les enquêtes menées par l'OIT en Tunisie ont permis de déceler les besoins de la population dans les zones d'intervention du projet comme le montre ce graphique:



Graphique 1: Préoccupations/ Attentes des citoyens

Source: enquête menée par le projet IPDLI sur les attentes de la population dans les zones d'intervention

Les différents outils mis en Œuvre par l'Etat visant une planification des programmes d'investissement au niveau local sont en large partie orientés vers des projets d'infrastructure couvrant principalement:

Table 1: Types et exemples d'investissements locaux

Type d'investissement	Exemple
Les infrastructures de base	Voirie et trottoirs, assainissement et drainage, éclairage public, signalisation, eau potable, embellissement de la ville, entretien de l'infrastructure existante, réhabilitation des quartiers populaires, Cimetières…
Les projets économiques	Lotissement, zones commerciales, marchés, salle de fêtes, parking, kiosques, abattoir, pépinières, bains maures, zones industrielles et artisanales, gares routières…
Les projets administratifs	Bâtiments administratifs, hôtel de ville, dépôt municipal Aménagement et entretien des bâtiments existants, recettes municipales…
Les projets socio-collectifs	Aménagement et entretien des équipements et terrains de sport, parcs, complexes sportifs (stades, piscines...), maison de jeunesse et de culture, salles de spectacles Musées, bibliothèques publiques, théâtres, jardin d'enfants, parc de l'enfant et de la famille…

Stimuler l'effort d'investissement chez les collectivités locales nécessite une convergence des efforts des différents acteurs publics et locaux vers une mobilisation des ressources financières nécessaires à la réalisation des investissements.

A ce niveau des problématiques majeures, pour lesquelles les autorités centrales et locales doivent apporter des réponses :

- Faire face à la carence en infrastructures de base due à une disparité régionale majeure qui caractérise notamment les communes nouvellement créées[27].
- Résoudre l'équation besoins en développement / situation fragile des finances publiques aggravée par la montée vertigineuse de l'endettement et des dépenses de fonctionnement (Salaires, subventions...)
- Parvenir à un équilibre entre les régions en termes d'effort d'investissement et d'infrastructure (Discrimination positive des zones défavorisées)
- Trouver des mécanismes de financement des programmes d'investissement qui couvre aussi bien la planification, les études et l'exécution et comment migrer des outils de financement classiques vers des outils de financement et des modalités de gestion permettant de pérenniser les investissements.
- Parvenir à une définition claire des rôles de chacun des acteurs nationaux et locaux et la recherches des complémentarités entre ces acteurs.

[27] Entre 2015 et 2016 deux décrets ont été publiés prévoyant la création de 86 nouvelles communes et l'extension territoriale de 187 déjà existantes portant le nombre total de communes de 264 à 350

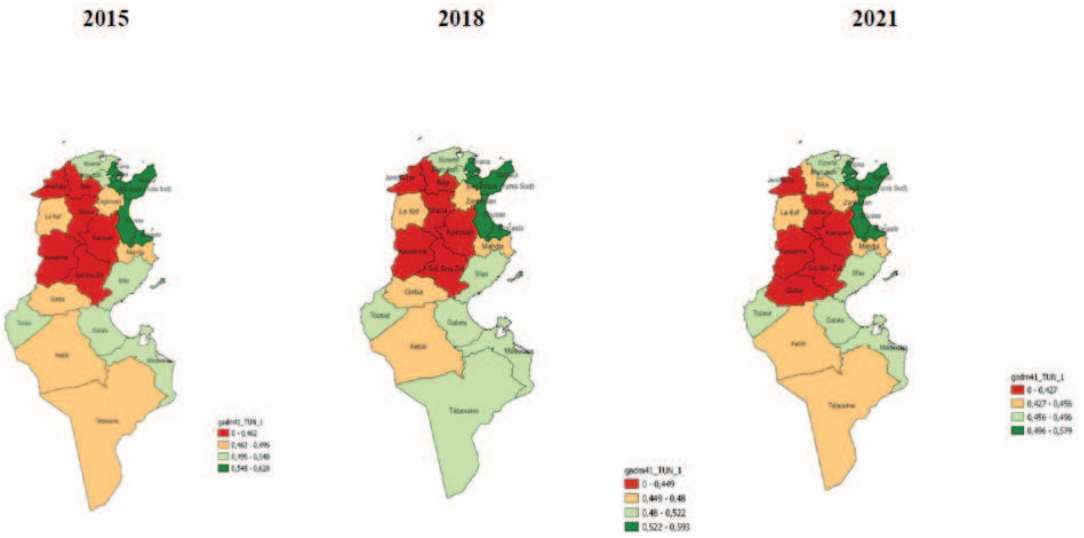
2. Focus sur les problématiques

2.1. Une disparité régionale en termes d'infrastructure de base

Une des principales causes de la révolution du 14 janvier 2011, la disparité régionale et le déséquilibre en termes d'infrastructure et équipement de base est un constat qui marquait la Tunisie depuis des décennies étant donné le modèle de développement adopté depuis l'indépendance basé sur des pôles de développement côtiers et marqué par la concentration des activités créatrices d'emploi dans les zones côtières (Principalement le Grand Tunis, le Cap bon, le grand Sahel et Sfax).

L'accès à l'infrastructure de base doit être analysé comme une des composantes clé du développement en étroite corrélation avec d'autre composantes axées vers à l'amélioration des conditions de vie des citoyen (Approche centrée sur l'humain) à savoir l'accès aux services de santé, éducation, loisir, accès au marché de l'emploi, capital humain…etc.

Les analyses et recherches en Tunisie ont établi une cartographie des disparités régionale établie sur la base d'un indice de développement régional combinant les variables ci-dessus mentionnées.



Graphique 2: Cartographie des disparités regionales en Tunisie

Source: Rapport de l'Institut Tunisien de la Compétitivité et des Études Quantitatives (ITCEQ)

Une analyse approfondie des disparités fait ressortir les explications suivantes pour ses causes majeures :

- Un faible taux de couverture en routes classées pour les zones intérieures
- Une faible proximité aux zones portuaires et aéroportuaires
- Un faible taux de raccordement au réseau d'assainissement
- Un faible taux de raccordement au réseau national d'eau potable

A ces obstacles de développement s'ajoute certainement des indicateurs sociaux-démographiques faisant apparaitre la faiblesse des services de santé, d'éducation, l'absences des services de loisirs, le taux de chômage élevé, le vieillissement de la population et le phénomène de migration.

2.2. Des besoins en financement et une situation fragile des finances publiques et locales

La situation économique du pays durant ces 10 derniers années n'a pas constitué un facteur propice au développement, une situation aggravée par la crise sanitaire de 2020, une crise géopolitique en 2022 et un contexte politique tendu marqué par des changements majeurs dans le système de gouvernance et la philosophie sociaux économique depuis le mois de juillet 2021.

Un net recul de la productivité et de l'investissement, de 25,4 à 17,8% du PIB entre 2010 et 2019, a largement affaibli le potentiel de croissance et la compétitivité du pays fragilisant ainsi ses équilibres intérieurs et extérieurs.

Les constitutions tunisiennes depuis 2010 ont mis le point sur l'importance des ressources financières des collectivités locales et la responsabilité partagée des différents acteurs locaux ce qui a été traduit par le code des collectivités locales (Loi organique n° 2018-29 du 9 mai 2018) en instituant 2 types de ressources à savoir les ressources financières transférées et les ressources financières propres, cette logique est confirmée par la loi 2019-15 du 13 février 2019, relative à la loi organique du budget dans son chapitre 5 : « Des dotations budgétaires sont allouées aux collectivités locales en fonction de leurs besoins de financement dans le cadre de l'équilibre du budget de l'État et conformément à la loi organique relative au code des collectivités locales. Les ressources des collectivités locales comprennent, outre leurs ressources propres :

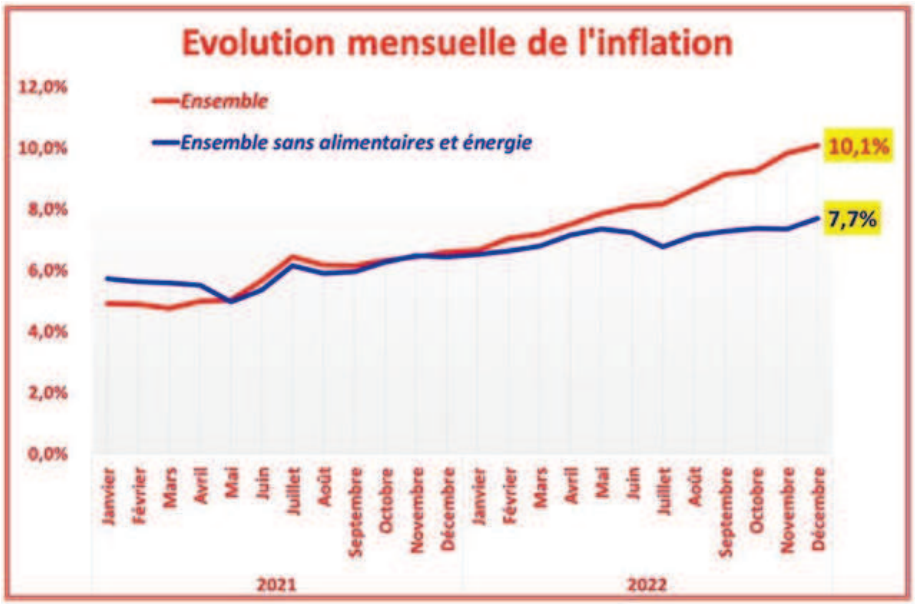
- - des recettes transférées par le budget de l'État sous forme de subventions,
- - des recettes transférées par l'autorité centrale pour la réalisation des projets de l'État au niveau local dans le cadre des programmes et des objectifs fixés »

Du coté des ressources propres, les collectivités locales souffrent du faible taux de recouvrement et du faible engagement des citoyens dans l'effort communal d'investissement et d'entretien des infrastructures et équipements de base.

Un aperçu des chiffres issues du département des collectivités locales au ministère chargé des affaires locales on peut mettre le doigt sur les soucis de financement :

- Les Budgets des communes sont composés de 36% provenant d'un appui budgétaire de l'Etat central, 64% reposent sur les ressources propres provenant des recettes fiscales, mobilisation des fonds, emprunts…etc.
- Le Taux national de recouvrement des taxes municipales ne dépasse pas 7.6% (un taux extrêmement faible entravant les efforts d'investissement des communes)
- 300 Millions de dinars (100 m$) de manque à gagner en ressources financières propres causé par la crise sanitaire COVID19.
- Une dette de 400 millions de dinars envers les contribuables (130 m$)
- Faible engagement de l'Etat central dans l'effort régional de développement (Réticence au partage de fiscalité, manque de support pour la stimulation du recouvrement, priorisation des dépenses publiques de fonctionnement …)

A ajouter un élément déterminant qui constitue une véritable entrave aux investissements en infrastructure il s'agit de la hausse d'inflation impactant les prix des matières premières de façon considérable. Une inflation à 2 chiffres qui a même impacté les marchés encours dont certains bloqué à cause des demandes d'avenants.



Graphique 3: Evolution mensuelle de l'inflation

Source: Rapport annuel de la banque centrale de Tunisie

La combinaison de ces éléments forme un obstacle au développement et réduit de manière conséquente la marge de manouvre des collectivités locales contraints à chercher des modes de financement sures, durables et efficaces.

2.3. Cadre légal et définition des rôles des acteurs locaux

Les acteurs œuvrant pour le développement régional en Tunisie sont multiples, le financement des investissements locaux implique l'intervention des:

- Communes : Principaux acteurs, responsables de mettre en œuvre les financements qui leur sont proposés pour leurs investissements
- Ministères : ministère des Finances, ministère de l'Intérieur (Département collectivité locale), ministère de l'Économie et de la planification
- Organismes Publics : CPSCL, CFAD, Concessionnaires de services publics, Agence Nationale de Protection de l'Environnement ANPE, ARRU ...etc.
- Société civile : rôle confié par les constitutions et lois organiques pour la programmation participative des investissements communaux et des budgets correspondants ;
- Secteur privé : Consultants, bureaux d'études et entreprises de travaux mobilisés pour la réalisation des infrastructures et équipements communaux, l'assistance technique et la formation
- Organismes de contrôle : Contrôle des dépenses, Contrôle Général des Services Publics, Cour des Comptes, CGF,
- Coopération internationale : Bailleurs, maitres d'ouvrages délégué, agences de coopération.

En présence de ces multiples acteurs et intervenants, le défi est de dresser un cadre légal définissant le rôle de chaque acteur et le mot clé : **trouver un lien de complémentarité afin d'atteindre l'objectif de développement régional notamment l'amélioration des infrastructures et équipements de base dans les communes**.

2.4. De nouveaux besoins en investissement

Le changement climatique et la rareté des sources d'énergie ont fait naitre chez les communes de nouveaux besoins en investissement. Entre l'installation de panneaux photovoltaïques destiné à assurer l'éclairage public, la mise en place de parcs éoliens ou la construction de centrales hydroélectriques, les collectivités locales manifestent des besoins en financement qui couvrent aussi bien les études et l'installation.[28]

Autres phénomènes naturelles causés par le réchauffement climatique impliquent de nouveaux besoins en termes d'infrastructures, il s'agit des incendies (affectant les régions forestières), les inondations touchant l'infrastructure de base, les soucis liés à la rareté des ressources hydrauliques (Exemple : Construction de barrages)

On remarque toujours ce dilemme qui se présente pour les entités locales dans le choix du mode de financement et dans tous les cas de figures l'incapacité de financer apparait comme une barrière à l'investissement même en optant pour les subventions au profit des citoyens ou des incitations fiscales (manque à gagner).

La recherche continue de solutions aux incapacités de financement a fait naitre des expériences pilotes (à énoncer dans la partie idées et solutions).

3. Financement des programmes d'investissement des collectivité locales : Idées solutions et expérience de l'OIT – Cas de la Tunisie

La Tunisie est en pleine phase de transition démocratique et de consolidation de ses institutions afin de rompre avec un modèle socio-économique qui a montré ses limites. C'est pour cette raison que l'administration tunisienne a doublé les efforts afin d'entamer des réformes structurelles dans plusieurs secteurs en vue d'aboutir à une nouvelle approche[29] du développement régional visant à réduire les disparités régionales de façon significative, et permettre aux communes défavorisées de rattraper leur retard en développement.

L'objectif majeur des réformes est de transformer le potentiel économique des régions en un levier de la prospérité nationale et parvenir à une complémentarité entre les politiques de développement et les politiques macroéconomiques et structurelles nationales. Un principe consacré par le plan de développement triennal 23-25 et adopté comme un fil conducteur de la vision de développement du pays jusqu'à 2035.

A cet effet la Tunisie s'est focalisée sur les ressources et les atouts de chaque région en essayant de :

1. Améliorer les performances des collectivité locales,
2. Identifier les opportunités d'investissement et de création de richesses dans les communes
3. Instaurer une gouvernance collective et concertée qui implique les différents niveaux (Etat-Région-Commune)
4. Orienter les efforts vers la spécialisation intelligente, l'innovation et l'optimisation des ressources afin de moderniser les infrastructures et améliorer la qualité de vie (aménagement, éducation, santé tourisme, loisirs…)

[28] Un chapitre entier consacré pour ces investissements dans le programme national des réformes du gouvernement Tunisien publié en juin 2022 : www.pm.gov.tn/pm/upload/fck/File/Programme2022fr.pdf

[29] Mise en œuvre du principe de l'unité de l'Etat consacré par la constitution Tunisienne « Article 4 : La Tunisie est un Etat unitaire. Il n'est pas permis d'édicter toute législation portant atteinte à son unité. »

5. Rendre les communes attractives et compétitives en termes d'infrastructures et équipements de base. [30]

Grace aux efforts des différents acteurs, la Tunisie s'est dotée d'un large choix de mécanismes de financement qu'on essayera d'énumérer. L'OIT a joué un rôle primordial pour le développement de certains outils d'une part, le perfectionnement des mécanismes mis en place et la confection d'une stratégie participative convergeant les efforts des différentes parties prenantes.

Tout a passé par une révision du rôle de l'Etat dans ce nouveau modèle de développement en accordant une marge de manœuvre aux collectivité locale (Principe de libre administration) consacré par la loi organique portant promulgation du code des collectivités locales, les constitutions de 2014 et 2021, planification et financement des infrastructures décentralisées, incitations fiscales pour attirer les investissement notamment les IDE et légiférer pour une collaboration efficace avec le secteur privé dans le cadre du PPP.

Réussir l'investissement local en infrastructure et équipement de base passe par une meilleure programmation et planification des investissements et de leur source de financement, un exercice que la Tunisie maitrise à travers les programmes d'investissement et de développement.

A cet effet il est important de revenir sur l'expérience de l'OIT (Projet IPDLI) dans le cadre de la mise en œuvre du processus de décentralisation et de développement territorial en Tunisie qui positionne les territoires communaux comme une locomotive de développement en appliquant les principes adoptés par le CCL relatifs à l'adoption d'un approche participative lors de la planification des programmes d'investissement ainsi que le principe de subsidiarité transformant la commune en une autorité locale autonome.

Etant données que les communes nouvellement créées restent peu outillées pour élaborer et piloter une stratégie de Développement Local (DL), l'OIT mandaté par l'IPAPD (Ministère en charge de la décentralisation) à piloter le processus d'élaboration des plans locaux de Développement et a œuvré à exploiter les potentialités des territoires et collecter les informations économiques locales pertinentes susceptibles de promouvoir la construction d'économies territoriales viables engagées dans le renforcement de la compétitivité nationale.

En partenariat avec le ministère chargé des affaires locales l'OIT a assuré l'assistance technique dans l'élaboration du Plan de de développement local selon les principes fondamentaux du Code des Collectivités locales (chapitre 4 : développement local et participatif).

Le PDL qui s'impose comme un document de planification stratégique, de programmation et de budgétisation nécessitant l'implication des différentes parties prenantes dans son élaboration.

Les travaux de programmation pilotées ont permis d'identifier des mécanismes de financement des programmes d'investissement et de concevoir des montages financiers assurant aux communes la réalisation de ses projets d'infrastructure et d'équipement de base à savoir :

[30] Article 105 du CCL : Le plan de développement local s'emploie, avec l'appui de l'Etat, à consolider les avantages comparatifs de chaque collectivité locale ou à lui conférer des avantages attractifs pour promouvoir son développement et y encourager l'investissement.

3.1. Le partenariat public privé : Un outil incontournable de financement des programmes d'investissement des collectivités locales

Le partenariat public-privé (PPP) est conçu comme un mode de financement par lequel une autorité publique (Etat ou collectivité territoriale) confie à une entreprise/prestataire privé la mission de financer, de construire ou de gérer des ouvrages, des équipements ou des biens immatériels nécessaires au service public. Le partenaire privé reçoit en contrepartie un paiement du partenaire public et/ou des usagers du service qu'il gère.

3.1.1. Instaurer un cadre légal et institutionnel garant de la réussite du PPP

Conscient de l'importance de ce mode de financement, l'instance générale de partenariat public privé a été créée en vertu de l'article 38 de la loi 49-2015 du 27 novembre 2015 relative aux contrats de partenariat Public Privé sous la tutelle de la présidence du gouvernement assurant les rôles suivants:

- Suivi de l'exécution de la stratégie nationale de partenariat public-privé,
- Contribuer à la programmation des projets relevant du cadre de partenariat public-privé en coordination avec les structures nationales concernée ainsi que les collectivités locales,
- Emettre un avis sur les études d'opportunité relatives aux projets à conclure dans le cadre de contrats de concessions, et sur les études d'évaluations relatives aux projets envisagés dans le cadre de contrats de partenariats public-privé,
- Assurer le contrôle du respect des principes fondamentaux régissant la conclusion des contrats de concessions et des contrats de partenariat et les procédures y afférentes,
- Suivre l'exécution et la mise en œuvre des projets relevant du cadre de partenariats public-privé et mener des opérations d'audit y afférentes,
- Fournir et assurer les mécanismes nécessaires relatifs à l'appui technique des personnes publiques aux niveaux central et régional et les assister dans la préparation et la conclusion des contrats de concessions et de partenariat public -privé ainsi que dans le suivi de leur mise en œuvre,
- Proposer des projets de réformes relatives aux textes juridiques
- Elaborer et mettre en œuvre des programmes de coopération aux niveaux régional, national et international en relation avec le domaine de partenariat entre le secteur public et le secteur privé.

3.1.2. Les avantages du PPP

Ce mode de financement présente plusieurs avantages :

- Assurer un délai rapide d'exécution des projets d'infrastructure avec une maitrise des coûts et une qualité d'exécution satisfaisante,
- Assurer l'introduction de la technologie et de l'innovation (Point fort du secteur privé) ce qui impactera positivement la qualité et l'efficacité des services publics.
- Renforcer les capacités du secteur privé local via les propriétés conjointes et la sous-traitance des certaines composantes des projets pour les entreprises locales dans des touchant les travaux publics, les travaux électriques, la gestion des équipements, les services de sécurité, les services de nettoyage, les services d'entretien, etc. ;
- Assurer une complémentarité avec le secteur public et répondre à la demande croissante en développement des infrastructures ;
- Bénéficier d'un meilleur rapport Qualité-Prix grâce à un transfert de risques adéquat vers le secteur privé tout au long du projet : de la conception/construction à l'exploitation/l'entretien.

4. Le PPP au service du développement régional

En Tunisie 54 projets de partenariat programmés ont été recensés pour la période 2020 et 2021 d'une valeur totale estimée à : 12 652 480 800,000 DT soit 4,1 Milliards $ dont on citera quelques exemples et dont certains projets feront l'objet de présentation:

Table 2: Quelques exemples de projets programmés dans le cadre du PPP en Tunisie

Secteur	*Projet*	*Maitre d'ouvrage*	*Valeur en DT*
Environnement et eaux	Station d'épuration à Tunis Nord	Office national de l'assainissement	257 300 000,000
Energie	Projet pour la production d'électricité à partir de l'énergie solaire d'une capacité de 500 mégawatts	Ministère de l'Industrie, de l'Energie et des Mines	1 100 000,000
Transport	Création d'un terminal vraquier au port de Bizerte	Office de la marine Marchande et des ports	300 000 000,000
Infrastructures urbaines	Rénovation et extension du Port de plaisance de Sidi-Bousaid	Ministère du Tourisme	50 000 000,000
Culture et Patrimoine	Restauration et la valorisation du monument archéologique "El Karraka"	L'Agence de renaissance du patrimoine et de développement culturel	27 000 000,000
Autres secteurs	Zone de libre-échange à Ben Guerden	Ministère du Commerce	41 000 000,000

Source: Rapport de l'IGPPP sur le PPP annexé à la loi de finances 2021

4.1. Les Montages financiers et les interconnexions des programmes sectoriels avec les programmes d'investissement locaux

De la planification, l'étude, la mise en œuvre et le suivi, le chemin requiert l'intervention de plusieurs acteurs et la mobilisation des fonds nécessaires. L'OIT via son projet IPDLI a réussi à identifier les interconnexions possibles entres les différents programmes d'investissement (Nationaux, sectoriels, communes) et a basé son appui financier et technique sur la complémentarité entre l'ensemble des parties prenantes. L'expérience pilote de l'OIT s'est transformé en un exemple à suivre grâce aux montages techniques et financiers opérés.

Nous exposerons des cas pratiques afin d'identifier les manœuvres mises en place pour garantir la finalisation des projets d'infrastructure et d'équipements de base dans quelques communes d'intervention du projet:

Cas pratique #1

AMÉNAGEMENT DU COMPLEXE ECOLOGIQUE THUBURNICA COMMUNE D'EL GALAA - JENDOUBA

Cout Total du projet: 1 409 775 DT soit 465 000 USD
Déblocage du projet Grace aux Etudes techniques, architecturales rentabilité économique, environnementales, prospection géophysique de source d'eau chaude financés par l'OIT au cout de 45000 DT (14700 $)

L'étude a décomposé le projet en plusieurs lots à financer chacun par une partie prenante (Montage financier confectionné par l'OIT -IPDLI)

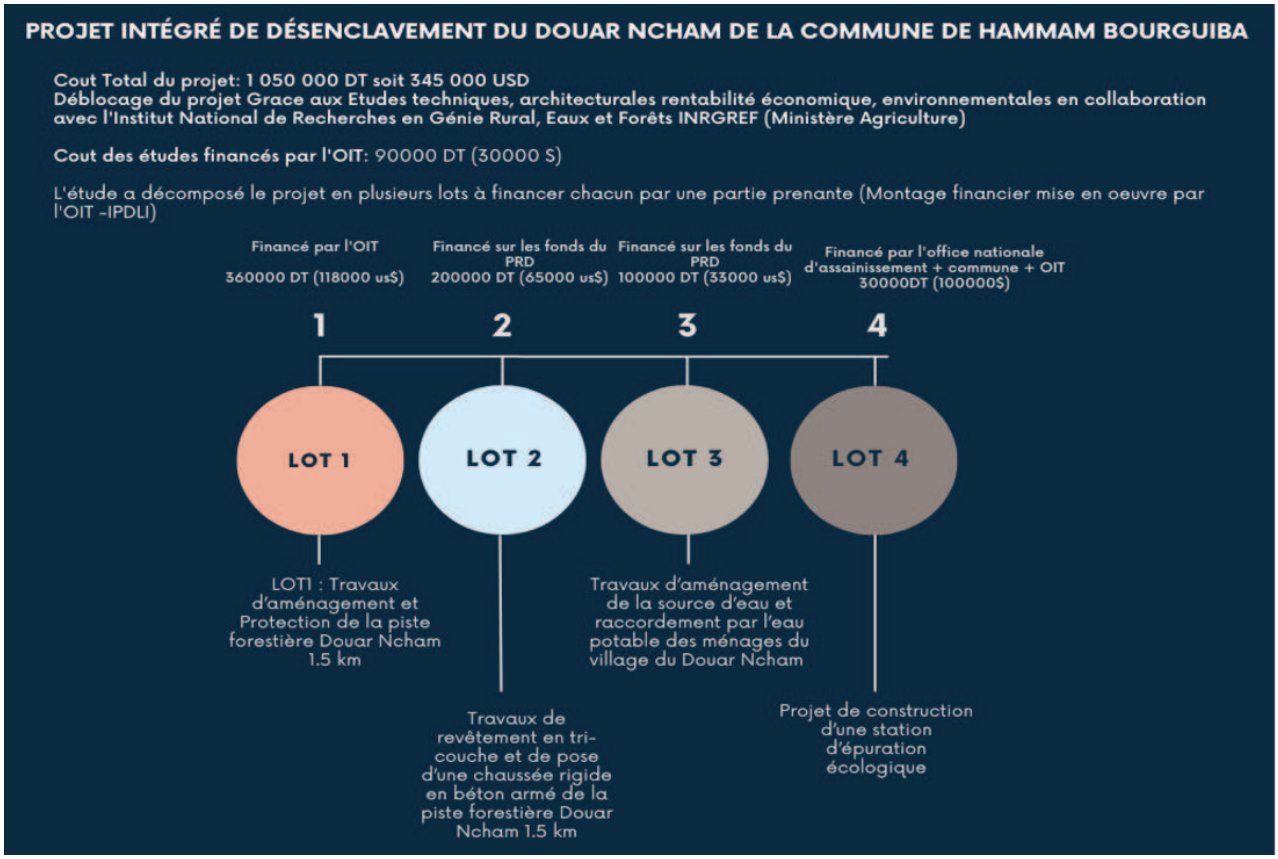
1	2	3	4	5	6
Financé par la Commune 600000 DT (197000 us$)	Financé par la Commune 100000 DT (33000 us$)	Financé par le conseil régional de Jendouba 165000DT (55000 us$)	Financé par l'office nationale d'assainissement 10000DT (32700$)	Financé par la Commune 60000 DT (19600 us$)	Financé par l'OIT 60000 DT (112000 us$)
LOT 1	LOT 2	LOT 3	LOT 4	LOT 5	LOT 6
Aménagement du bain populaire Sidi Belgacem (station thermale) Budget de la Commune	Aménagement de la source d'eau	Aménagement de la piste reliant le site du projet de la zone écologique Thuburnica avec la route principale + Parking des voitures	Raccordement du bain populaire Sidi Belgacem aux réseaux d'assainissements LOT1 Fourniture de conduites d'assainissement	Raccordement du bain populaire Sidi Belgacem aux réseaux d'assainissements LOT 2:Travaux de pose de raccordement par le réseau principal d'assainissement	Aménagement d'un sentier écotouristique Construction d'une passerelle piétonne métallique en arc Construction de (06) locaux en bois pour la commercialisation des produits de terroir de la communauté

La population de cette zone d'intervention a démontré une réelle volonté de s'engager dans un processus d'auto-développement. Le périmètre qui existe depuis plus d'une centaine d'années couvrait une superficie de 70 ha, mais à cause de l'amenuisement des ressources en eau, il ne couvrait que 20 à 25 ha avant l'intervention du projet et nécessitait une restauration totale.

Le projet consiste donc en la construction d'une séguia de 2100 mètres linéaires, en maçonnerie sur le cheminement de la séguia principale existante, en format de U, avec les pierres de la région, et sa dotation en ouvrages appropriés de partage équitable de l'eau et de protection. Ceci a permis de mobiliser et valoriser les ressources humaines et matérielles locales. Le projet a organisé, avec l'appui d'un bureau d'étude, des séances de formation sur l'organisation de chantier et sur les procédures de passation de marchés le conseil communal avec l'OIT. Ces formations ont contribué au renforcement de capacité du bureau communal. D'autres partenaires ont contribué à la réussite de ce projet, tels que le GDA Ain el Barka, le CRDA de Jendouba, le CTV, l'arrondissement des forêts.

La deuxième partie du projet consiste en l'aménagement d'un circuit écotouristique, comprenant un pont suspendu, en partance du hammam jusqu'au seuil de déviation, avec une unité de vente de produit de terroir.

Cas pratique #2



Présentation du village du Ncham	Principales problématiques : (Motifs d'intervention)
Nombre de ménages : 55 ménages (290 Habitants) dont 40% sont des femmes Superficie totale : 100 Ha des potentiels forestiers, 30 Ha de terre agricole Principales activités économiques :- Elevage ovin, bovin, volailler, Exploitation forestière du chêne liège, chêne zen, pin pignon et les plantes aromatiques	- Enclavement - Pas d'accès à l'eau potable - Exode rurale (MO actives) - Absence d'activité économique - Assainissement : Risque de contamination de la nappe et impact négatif sur la faune et la flore

4.3. Le financement participatif : CROWDFUNDING

Le crowdfunding est un mode de financement qui rompt avec les outils traditionnels du financement. Il est défini comme un mécanisme qui a pour objectif de collecter les apports financiers d'un grand nombre de particuliers au moyen d'une plateforme dans l'objectif est le financement de projets (Agriculture, Patrimoine et même l'infrastructure). Le financement participatif peut prendre plusieurs tels que le don (donation crowdfunding), la récompense (don avec contrepartie), le prêt (aussi appelé creditcrowdfunding, crowdlending ou prêt participatif)

Et comme pour chaque mode de financement, son efficacité dépend largement du cadre légal instauré.

En Tunisie, le crowdfunding est géré par la loi n°2020-37 du 6 août 2020, un ensemble de décrets d'application de cette loi viennent de voir le jour dans le journal officiel du 21 octobre 2022 dotant ainsi la Tunisie d'un cadre légal de ce mode de financement.

Comment le crowdfunding peut servir comme un outil de financement des programmes d'investissement ?

A travers la mobilisation de l'épargne de proximité des citoyens, ce mode de financement permettra de répondre aux besoins de financement des collectivités locales en projets de

développement locaux. Le crowdfunding contribue au financement de projets associatif à fort impact social grâce à sa logique de mobilisation des citoyens autour des initiatives orientée vers le développement.

A titre d'exemple nous présenteront le cas Arij el Médina à Sfax (Capitale économique de la Tunisie) un projet d'investissement dans la médina de Sfax qui a pour objectif de sauver ce patrimoine d'une disparition imminente et certaine.

Créée en 2014 avec un capital de 1 million de dinars investi par 99 actionnaires, Arij el Médina procède actuellement à une levée de fonds de 3 millions de dinars pour commencer la rénovation du patrimoine dans la ville.

Ce mode de financement assurera une complémentarité avec le rôle de l'Etat qui doit l'encourager à travers les mécanismes d'incitations dont il dispose (Incitations financières, fiscales…)

L'objectif : Dupliquer cette expérience aux projets d'infrastructure et équipements de base et s'inspirer de l'expérience réussie en suisse et en Etats unies (Exemple cas de la platform crowdfunding « Infrashares » créées en 2017 en états unies)

Table 3: Exemple de platform Crowdfunding dans le domaine des infrastructures

No	Project	Sector	Cost (in USD)	Minimum Investment (in USD)	Project Status	Outcome
1.	SDSF Solar Fund IV	Renewable Energy	5 million 506(c) Offering	25,000	Still offering	Solar Fund offers a triple play of benefits: it lowers taxes, offsets dirty fossil fuels, and helps mission-based organizations acquire clean, cost-effective solar.
2.	ESG Clean Energy	Renewable Energy	5 million 506(c) Offering	25,000	Still offering	Attractive and predictable income returns included electricity sales, transmission, capacity and alternative energy credits
3.	Cityzenith	Digital Twin	33 thousand 506(c) Offering		In Progress/ Under Construction since 2020	Advanced Digital Twin Solution for Infrastructure
4.	The Gateway Opportunity Fund	Real Estate Development	33 million 506(c) Offering	100,000	In Progress/ Under Construction since 2020	Using a crowdfunding platform as a part of their fundraising enables individual community members to actively participate in the economic and physical redevelopment of their city.
5.	Matrix Materials	Transportation	40 thousand 506(c) Offering		In Progress/ Under Construction since 2020	Working Capital Loan for Fairfax County Pilot Project

Source: Presentation du Crowdfunding for Infrastructure Projects Financing - Economic Research Center, Indonesian Institute of Sciences

4.4. Autres pistes de financement

En continuité aux solutions de financement des programmes d'investissement plusieurs autres mode de financement peuvent être envisagés et des acteurs nationaux agissant localement peuvent être sollicités, on évoquera sans détails les autres pistes à engager dans le contexte tunisien:

4.4.1. Les programmes de développement au service des projets d'infrastructure locales

Nous exposerons l'expérience du programme de développement intégré PDI mis en œuvre par le CGDR (Commissariat général au développement régional) sous tutelle du ministère de l'économie et de la planification pour un cout total de 520 MDT. Il s'agit d'outil de promotion régionale décidé depuis 2011 portant sur 90 projets dans sa 1ère (54 projets) et 2ème (36 Projet) tranche, touchant les délégations prioritaires du pays, notamment dans les gouvernorats de l'intérieur (81% de l'ensemble des projets).

Les principales composantes proposées dans le cadre de ces projets consistent en la création de 12400 projets individuels, la formation de 8700 bénéficiaires dans divers domaines, l'aménagement de 3200 ha de PPI, l'aménagement de 60 zones industrielles et artisanales, la création de 5 cyber-parcs, l'aménagement de 900 km de routes et de pistes rurales, l'alimentation en eau potable de 8000 familles en milieux rural et urbain et la construction de 90 édifices dans différents secteurs.

Le projet IPDLI-OIT développe des relations de partenariat solides avec le CGDR, l'expérience des projets conjoints menés avec cette institution sera exposée (Unité de Valorisation des produits agricoles à la commune de Chreyaa Machreg Shams – Gouvernorat de Kasserine).

4.4.2. Le Rôle primordial de la Caisse des prêts et de soutien des collectivités locales

Créée en vertu du décret n°92-688 du 16 avril 1992, la Caisse des Prêts et de Soutien des Collectivités Locales assure les taches suivantes:

- La collecte des ressources nécessaires pour contribuer au financement des programmes d'investissement des collectivités locales ;
- L'assistance technique aux collectivités locales au niveau de l'identification, l'étude, la réalisation et le suivi de leurs projets d'investissement ;
- L'assistance aux collectivités locales pour une bonne gestion de leurs ressources, et ce par l'analyse de leurs situations financières et la proposition de mesures pratiques leur permettant l'amélioration de leurs ressources propres et la rationalisation de leurs dépenses d'investissement.

4.4.3. Rôle de la caisse de dépôt et de consignation (CDC)

Créée en 2011 cette institution participe à la réalisation des investissements quels que soient leurs délais d'une manière directe ou indirecte ou dans le cadre de partenariats avec le secteur privé dans tous les domaines économiques à caractère stratégique, tout en veillant à leur viabilité économique et plus précisément dans l'infrastructure, le développement régional, les secteurs des nouvelles technologies, de l'environnement et du développement durable ainsi que le soutien aux petites et moyennes entreprises.

4.4.4. Les fonds de développement régionaux

La CDC a lancé en 2012, le Fonds de Développement Régional doté d'une enveloppe de 50 millions de dinars, pour le financement des entreprises désireuses de s'implanter dans les zones de développement régional. En 2014, la CDC a renforcé les opportunités d'investissement dans les régions d'une taille cible de 100 MDT.

A la clôture de ce Fonds, fin 2018, le bilan était satisfaisant : le FDR a pu financer 25 projets dans divers secteurs, pour un total de 38 millions de dinars en décaissement (41% en capital création et 59% en capital Développement). Il convient de noter que 83% de ces décaissements ont été effectués dans les zones de développement régional ; sachant que les investissements financés se sont élevés à 300 millions de dinars. (Source : rapport annuel CDC)

5. IV- Le financement des programmes d'investissement locaux : stimulation de l'emploi

La mise en place d'une stratégie de financement des programmes d'investissement et une diversification des outils de financement en l'adaptant à la spécificité de chaque Zone/Pays/Localité conduit essentiellement à la satisfaction des attentes des citoyens ayant besoin d'une infrastructure de base améliorant leur qualité de vie.

L'expérience de l'OIT en Tunisie qui se manifeste par un accompagnement du processus d'élaboration des programmes de développement locaux et d'un appui à la réflexion autour d'un modèle de développement national centré sur l'humain, propice à la création de richesses, intégrant les jeunes, les femmes et les catégories vulnérables et œuvrant pour la création des emplois décents, a clairement montré l'impact d'une stratégie de financement des programmes d'investissement résultant d'une approche participative impliquant les différents acteurs locaux et nationaux sur la création de l'emploi.

Trouver les moyens nécessaires pour financer ses programmes de construction, d'aménagement ou de réaménagement des infrastructures de base, des projets économiques, des projets administratifs et des projets socio-collectifs conduit à:

1. **La création d'emplois directs** : Entreprises de bâtiments, ouvriers, maçonnerie, plomberie, menuiserie, électricité, architectes, ingénieurs, techniciens, jardinage…
2. Cette création de postes d'emploi a été bien réfléchie (Expérience OIT en Tunisie) axée sur la favorisation de la main d'œuvre locale confirmant les orientations pour un modèle de développement propice à la création des richesses.
3. **Création d'emploi indirects** : à travers la nécessité des projets d'infrastructure à des services essentiels (Conception, Architecture, ingénierie, experts, services adm et financiers…), transport, logistique, distribution achat de matériaux locaux et de fournitures…etc.
4. Le développement de ces activités fortement liées à l'exécution des programmes d'investissement où le financement constitue la pierre angulaire permet l'instauration d'une dynamique économique pour les entreprises locales mettant en place un climat convenable pour l'investissement et la création des PME d'où la création de nouveaux emplois.

5. **Préservation des emplois existants** : Il ressort de l'expérience du projet IPDLI – OIT que le développement des projets d'infrastructure dans les zones rurales et les communes défavorisés a conduit à une réduction notable du chômage technique dont souffre la main d'œuvre locale. Autre que les travailleurs en situation difficile vu l'absence des opportunités d'emploi, des artisans et des petites entreprises se trouvent au bord de la faillite.

L'effort conduit pour la mobilisation des ressources financières essentielles à l'exécution des projets a redonné espoir à ces emplois, créée de nouvelles opportunités et réduit le chômage dans les zones d'intervention.

Amélioration de l'attractivité et développement du tissu économique : Le financement des programmes d'investissement aura également des effets notables « post-opératoires » conduisant à l'amélioration de l'attractivité des zones d'intervention en tant que lieux favorables à l'investissement dotés de main d'œuvre qualifiée jouissant d'un appui international, national et local en termes de mobilisation de fonds. Ça permet également l'ouverture de perspectives d'investissement nouvelles conduisant essentiellement à une baisse du chômage, l'amélioration des accès aux services de base et l'amélioration de la qualité de vie.

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Notes

La formalisation des travaux agricoles, forestiers et oasiens retour sur l'experiences de la Tunisie

Monaem Khemissi

09

La formalisation des travaux agricoles, forestiers et oasiens retour sur l'experiences de la Tunisie

Monaem Khemissi

Sub-theme: Aptitude et compétence pour une infrastructure transformatrice et de moyens de subsistance durable

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Resume

En Tunisie environ 1,2 million d'habitants vivent dans et à proximité des forêts (10 % de la population) , le secteur forestier joue un rôle important dans la conservation de la biodiversité, la protection des eaux et des sols, l'atténuation du changement climatique, l'amélioration des conditions socio-économique et la création d'emploi, en effet, la forêt tunisienne offre un nombre d'emplois non négligeable dans les régions les moins développées du pays entre 5 et 7 millions de jours de travail par an. Les oasis tunisiennes permettent à environ 900 000 Tunisiens de vivre (10% de la population) et les gouvernorats concernés représentent ¼ du territoire national. Pour conclure l'agriculture en Tunisie est un secteur économique très important, il génère 10,4 % du PIB national et assure 15 % des emplois.

Les changements climatiques impactent d'une façon directe ou indirecte le revenu des usagers qui sont les principales victimes à la suite de la régression des parcelles exploitables et empêchant l'axées aux ressources.

La conservation des moyens de subsistance et la résilience des groupes vulnérables ; les jeunes et les femmes représente un défi pour un développement locale intégré.

La résilience de la population locale à travers la mise en œuvre des chantiers écoles en collaboration avec les services déconcentrés est par la suite validé à la dispositif de la formation professionnelle le curricula acquis dans les chantiers école vert (travaux : forestier , oasien et agricole) .L'accompagnement post apprentissage pour la création des entreprises et l'élaboration des plans d'affaires pour améliorer de manière durable les performances des porteurs de projets et de leurs entreprises au sein de l'environnement économique et social dans lequel ils évoluent, ce processus leurs permettront d'accéder activement à un grand nombre de compétences pour créer et exploiter une entreprise prospère à travers le changement de comportement et l'assimilation des principes et outils de la création et de la gestion de leurs PME et l'axées aux marchés .

La formalisation et la restructuration des activités des jeunes créateurs est l'une des étapes la plus importante dans ce dispositif vu que les bénéficiaires s'orientent vers l'instauration des structures socio-professionnelle dans le cadre de l'économie social et solidaire (coopératives) pour avoir plus de chance à l'accès au marché publique dans les travaux verts dans le cadre de la concession.Une comité nationale présidé par le ministre de l'agriculture et des ressources hydrauliques et de la pèche à était mis en place pour soutenir ce programme pour modéliser le pilote afin d' avoir une nouvelle génération de jeune entrepreneure dans les travaux verts capable de gérer les défis des changements climatiques.

1. Introduction

La Tunisie est un pays d'Afrique du Nord qui possède un secteur agricole important, qui contribue significativement à son économie, d'après l'Institut National des Statistique INS, en 2014 le secteur agricole en Tunisie génère environ 10,4 % du PIB et contribue à la création d'emploi d'environ 15 % de la population active. Aujourd'hui l'agriculture, les forêts et les oasis représentent des sources de revenus pour de nombreux Tunisiens, ainsi qu'une source de subsistance pour les populations rurales.

La Tunisie fait face à un phénomène de la transformation du monde rural qui combine l'exode rural, le vieillissement des populations rurales et effets des changements climatiques, Cependant, la population rurale a continué à croître jusqu'à maintenant, mais elle ne représente que le tiers de la population nationale. L'État a fourni un effort considérable pour réduire les disparités entre ville et campagne, et plus de 90 % des ruraux ont accès à l'eau potable, 97 % à l'électricité, et les écoles et dispensaires répondent aux besoins du plus grand nombre.

Si on prend le cas de la forêt environ 1,2 million d'habitants vivent dans et à proximité des forêts (soit 10 % de la population). Pour le cas des oasis tunisiennes permettent à environ 900 000 Tunisiens de vivre et les gouvernorats concernés représentent ¼ du territoire national.

La résilience de la population face à ses changements climatiques et autres, c'est à travers qu'elles moyens? quelle stratégie d'intervention assurer les conditions de vie des habitants dans le contexte forestier et oasiens dans notre cas de figure.

C'est dans le cadre de l'appui au processus de la décentralisation en Tunisie et dans l'objectif de l'accompagnement des communes avec prédominance forestières et oasiens qui nécessite une modélisation et des interventions spécifiques.

Le projet Initiative Pilote pour un Développement Local Intégré (IPDLI), mis en œuvre par L'Organisation Internationale du Travail (OIT) et financé par l'Union Européenne et la Coopération Suisse DDC (2018-2025), sous la tutelle du Ministère de l'intérieur département des Affaires Locales a pour objet de soutenir le processus de la décentralisation aux nouvelles communes.

Dans notre cas d'étude un programme pilote de création des petites et moyennes entreprises à travers le lancement des chantiers écoles verts selon l'approche HIMO dans deux communes à vocation forestières au Nord-Ouest de la Tunisie et une commune à vocation oasienne au sud de la Tunisie.

2. Contexte General

La Tunisie possède une biodiversité riche et variée grâce à sa situation géographique, son climat méditerranéen et sa diversité de paysages.

En termes de forêts, ce secteur joue un rôle important dans la conservation de la biodiversité, la protection des eaux et des sols, l'atténuation du changement climatique, l'amélioration des conditions socio-économique et la création d'emploi, en effet, la forêt tunisienne offre un nombre d'emplois non négligeable dans les régions les moins développées du pays entre 5 et 7 millions de jours de travail par an, soit l'équivalent de 17 500 emplois permanents qui bénéficient à environ 100 000 ménages. La valeur économique du patrimoine forestier dans notre pays est estimée à 237 millions de Dinars et génère une valeur annuelle estimée à environ 150 millions de Dollars de biens et services et contribue à 1,5 % du PIB en 2017.[1]

Cependant le secteur forestier est face à plusieurs défis à savoir :

- La dégradation continue des ressources due essentiellement aux effets combinés des conditions climatiques défavorables caractérisées par des précipitations rares et irrégulières, de la surexploitation, du surpâturage et du défrichement illégal
- Faible nombre d'entreprise spécialisée dans la réalisation des travaux forestiers et le manque de main d'œuvre qualifiés (Chaque année seulement 20 % du budget de l'état est consommé pour la réalisation des travaux forestiers)
- Large partie du travail dans le secteur forestier est considéré comme informel (production des charbons, coupe illégale des arbres, etc...) et se caractérise souvent par des conditions de travail déplorables, des salaires insuffisants, la précarité de l'emploi et un manque de protection de la santé et de la sécurité du travail,

Selon le plan de développement des ressources forestières et pastorales (PDRFP) établi par la Direction Générale des Forêts, le secteur forestier continue à être un secteur stratégique où l'état doit continuer à jouer un rôle de premier plan. De par les biens et services qu'il permet d'en tirer et la qualité de vie qu'il offre aux citoyens, le secteur forestier peut influencer, de la façon dont il est géré, profondément l'avenir de la société tunisienne, par ailleurs uniquement 20 % des fonds alloués à l'exploitation forestière sont dépensés chaque année, les contraintes liées la faible consommation de ces fonds sont divers tels que:

- Le manque de qualification des ouvriers spécialisés en exploitation du liège (démascleur ou leveur) et du bois (bucheron).
- Le manque des entreprises locales dans les travaux forestiers (4 entreprises régionales sur 134 Entreprises à l'échelle nationale) .
- La capacité de martelage et de gestion des chantiers forestiers est limitée par manque de techniciens forestiers.
- L'absence d'une sylviculture adéquate et d'un aménagement adapté n'ont pas favorisé une exploitation forestière rationnelle.
- Manque de crédits annuels réservés à la récolte de liège.
- Retard cumulé des quantités importantes de liège non récoltés durant les 12 dernières années.
- La législation forestière en vigueur ne permet pas une implication suffisante de la population locale en matière de gestion et d'exploitation des forêts.

[1] http://www.onagri.nat.tn/uploads/veille/foret16-8-2019.pdf

Les oasis de Tunisie sont également un trésor naturel important, Elles jouent de multiples et importants rôles sur les plans économiques, écologique, social et patrimonial, Elles ont une place importante au niveau régional et national (la production des dattes participe pour 13à 16 % dans la production arboricole, pour 5 à 7 % dans la production végétale et pour 16 % dans les exportations agricoles occupant ainsi la 3eme place après l'huile d'olive et les produits de la pêche)

Les oasis sont classées en plusieurs types, d'où l'on parle des oasis sahariennes, des oasis de montagne et des oasis côtières (à Gabes) qui sont les uniques oasis maritimes de la Méditerranée. La superficie des oasis n'a cessé de s'étendre pour passer de 16 720 ha en 1973 à 41 710 ha en 2010[2].

Dans l'oasis existe un microclimat particulier contrastant avec un environnement désertique hostile et des conditions climatiques rudes et où la vie de l'homme est très difficile. Les oasis en Tunisie sont confrontées à plusieurs défis, notamment :

- La pénurie d'eau : Les oasis dépendent de l'eau pour leur survie. Cependant, la Tunisie fait face à une pénurie d'eau, ce qui rend difficile la croissance des cultures.
- La vulnérabilité des oasis face aux changements climatiques (accroissement des besoins en eau et des coûts de pompage, intrusion des eaux marines, risque de non- hibernation des espèces fruitières et chute des rendements, desséchement des dattes, attaque plus élevée des palmiers par l'acarien Boufaroua ; fréquentation touristique plus réduite, ...)
- La désertification : Les pratiques agricoles non durables ont entraîné la désertification de certaines zones de l'oasis.
- La surexploitation et la dégradation de la qualité des ressources en eau, la concurrence autour de la ressource, la mauvaise gestion et l'insuffisance accrue aux anciennes oasis,
- La dégradation de la qualité des sols : La pratique de l'agriculture intensive a entraîné la dégradation des sols dans certaines zones, ce qui rend difficile la croissance des cultures.
- La migration des jeunes : Les jeunes de l'oasis sont souvent attirés par les villes pour trouver du travail, laissant les terres agricoles à l'abandon.
- La concurrence des produits importés : Les produits agricoles importés sont souvent moins chers que les produits locaux, ce qui rend difficile la compétitivité des agriculteurs locaux.
- La salinisation et l'hydromorphie des sols, suite à un mauvais drainage et à une carence d'assainissement des zones urbaines limitrophes des oasis
- L'ampleur de l'accroissement illicite des palmeraies et la faible diversification de l'économie locale
- La perte de la biodiversité phoenicicole, fruitière, herbacée et faunique et la tendance vers le développement des systèmes de production en monoculture,
- L'accentuation du morcellement et de l'indivision, conduisant parfois à l'abandon des terres et à la marginalisation de l'agriculture familiale
- La pollution industrielle et domestique et l'ensablement de quelques oasis .

Ces défis ont un impact sur la durabilité économique, environnementale et sociale des forêts et les oasis en Tunisie. Ces enjeux visent à trouver des solutions innovantes pour répondre à ces défis et promouvoir le développement durable des oasis en Tunisie.

[2] https://www.raddo.org/content/download/22232/466114/version/1/file/Les-oasis-de-Tunisie-a%CC%80- prote%CC%81ger-contre-le-changement-climatique1.pdf

3. Methodologie pour la mise en oeuvre du programme « appui a la creation des emplois decent a travers les tavaux verts »

A l'issue des ateliers de Plans de Développement Locaux réalisés dans les communes à vocation forestière et oasienne, les orientations de développement local tels que définie dans ces PDL visent à l'amélioration des conditions de vie de la population, sur les bases d'un développement durable qui prend en considération l'élément humain comme élément primordial particulièrement au niveau de l'exploitation et de la protection du couvert forestier et oasien, tout en intégrant la composante économique et environnementale et pour assurer la gestion efficace et durable de ces ressources naturelles.

3.1. A/Le cas des communes a vocation forestieres

Parmi ces trois communes forestières sont les communes de Galâa-Maâden-Forgsan, Hammam Bourguiba et la commune de Ain Drahem du gouvernorat de Jendouba En effet, une grande proportion de la population des trois communes réside dans les forêts (70%) des résidents, depuis une décennie la population de ces communes a connu un exode rural important. Les causes de départ sont diversifiées mais la plus importante reste la recherche d'emploi et de meilleures conditions de vie, malgré l'existence d'un potentiel attrayant en ressources en eaux (barrage et lacs collinaires), une capacité forestière importante avec un couvert végétal bio diversifié et une richesse de la flore et de la faune.

Table 1: Cas de répartition de la population pour la commune de Hammem Bourguiba (entre 2004 et 2014)

Localité	Population	Population	Solde migratoire	Taux d'accroissement
	2004*	2014	2004-2014	annuel moyen
Khmairia	5505*	4526	-979	-1.78
Sloul	2868*	2358	-514	-1.79
Rwii	3957*	3237	-720	-1.82
Tagma	2374*	1952	-422	-177
Total	**14805***	**12173**	**-2632**	**-1.8%**

**Données l'Institut National des Statistique INS*

3.2. Presentation du programme

C'est dans le cadre du projet IPDLI (BIT) en collaboration avec la Direction Générale des forêts (DGF) ont lancé un programme pilote de création des PME active dans le secteur forestier au profit des jeunes et des femmes dans ces trois communes. Ce programme a commencé en 2020 avec un groupe d'un trentaine des jeunes et femmes , ces derniers ont été formés dans le cadre des chantiers écoles créés en collaboration avec les arrondissements des forêts de Jendouba en tant que son rôle du maitre d'ouvrage qui a mis tous les moyens disponibles (parcelles forestières de démonstration, techniciens, Poste forestier et autres) et pour la formation théorique et technique

a été assurée par le centre de formation professionnelle Agricole de l'état spécialisé dans les activités forestières au Gouvernorat de Bizerte . Ainsi ces jeunes ont été initiés aux différents travaux forestiers (Reboisement, Bucheronnage, Démasclage de chaine liège, Conservation des Eaux et du Sol, etc...) et les modes de valorisation des produits forestiers .Ce programme a permis aux jeunes demandeurs d'emploi sans qualification d'être formés et certifiés, tout en étant rémunérés dans le cadre de la mise en œuvre des chantiers de travaux démonstratifs, par un mécanisme d'accréditation national dans des techniques de construction alternatives, écologiques et intensif en emplois (à haute intensité de main d'œuvre), basées sur l'utilisation des matériaux locaux, qui sont en abondance dans les territoires communaux et ont un énorme potentiel de développement économique et social. Cela a conduit à la création/développement de PME spécialisées dans la production et l'utilisation de matériaux locaux, la réalisation de travaux vert/forestiers, etc.

Figure 1: Travaux de conservation des eaux-commune de Galâa-Maâden-Forgsan

Figure 2: Travaux de collecte de la pin d'alep commune de Galâa-Maâden-Forgsan

3.3. Cadre institutionnel

Afin d'atteindre ses objectifs, le projet IPDLI s'est doté d'un modèle de gouvernance locale au niveau de chaque site d'intervention à travers un dispositif d'accompagnement et de mise en place du chantier école forestier composés par :

- Les autorités locales : Mr le délégué de chaque territoire et le président de la commune.
- Les deux arrondissements des forêts (Jendouba et Ain Draham) entant que partenaire stratégique.
- L'Union Générale des travailleurs Tunisiens (UGTT), la principale centrale syndicale de Tunisie n'a cessé, depuis sa création, de soutenir les travailleurs tunisiens, d'encourager les initiatives de création de l'emploi pour les jeunes.
- L'Union Tunisienne de l'Industrie du Commerce et de l'Artisanat (UTICA), l'organisation patronale nationale qui représente les entreprises du secteur privé.
- -L'Union Tunisienne de l'Agriculture et de la Pêche, comme son nom l'indique c'est l'organisation nationale indépendante qui représente les professionnels du secteur primaire du pays.
- L'ANETI (l'Agence Nationale pour l'Emploi et le Travail Indépendant) entant que structure

d'appui et d'accompagnement des promoteurs pour la mise en place de leurs entreprises dans le secteur forestier.
- L'AVFA (Agence de vulgarisation et formation agricole), la seule structure chargée de la formation professionnelle agricole pour la validation de l'apprentissage et l'accréditation de la formation.
- L'ODSYPANO (office de développement sylvopastoral du nord-ouest) partenaire technique, chargé d'un développement territorial dans un contexte rurale basé dans les gouvernorats du Nord-Ouest.

Les activités de la formation, l'acquisition des équipements, l'accompagnement, la formalisation des activités et à la passation du marché au niveau de la direction générale des forêts seront consolidés afin de garantir l'ancrage institutionnel et à la création d'un partenariat publique privé.

3.4. Beneficiaires du projet

La population cible à était choisie selon un ensemble des critères de sélection concerté par les membres du comité locale de suivi et de mise en œuvre du chantier école forestier tel que :
- Des jeunes et des femmes originaux de la localité ou le tranche d'âge varie entre 18 et 35 ans
- Chercheurs d'emploi ou ayant travaillé dans les chantiers occasionnels avec la direction générale des forêts
- Capable d'exercer des travaux dans des conditions climatiques différents.
- Dispose d'un niveau d'instruction qui les permet de lire, d'écrire et de faire des opérations de calcules
- Avoir un esprit entrepreneurial pour s'installer pour leur propre compte.

3.5. Apprentissage: formation modulaire et pratique

C'est le Dispositif qui a choisi de sélectionner les jeunes qui seront formés selon l'approche modulaire de l'AVFA et de faciliter la mise en place du chantier école forestier en raison de la présence d'un savoir-faire métier, d'une communauté d'experts, l'existence de structures à même de soutenir le projet dans la région et également la création des TPE et PME locale dans le secteur forestier.

Un programme de formation préétabli (400 Heures) avec le centre de formation professionnelle agricole et les services de l'emploi selon l'approche modulaire sans oublier une module sur la santé et le sécurité du travail, le programme est composés d'une partie pratique qui a eu lieu dans les parcelles démonstratifs alloués par les services des forêts (80 % des nombres des heures de la formation) et la partie théorique a eu lieu au siège de centre de la formation .Les modules de formation permet l'acquisition des compétences techniques toute en respectant les différentes activités des travaux forestières répartis sur toute l'année comme indiqué dans le tableau ci-dessous .

Table 2: Répartition annuelles des travaux forestiers

	Jan	Fév	Mar	Avr	Mai	Juin	Juil	Aout	Sept	Oct	Nov	Déc
Dégagement des maquis												
Ouverture des tranchets pare-feu												
Conduite de peuplement des pins												
Conduite de peuplement du Chêne liège												
Récolte de liège												
Reboisement												
Travaux d'infrastructure												
Travaux de conservation des eaux et des sols												

Figure 3: Centre de formation professionelle forestier de Rimel

Figure 4: Séance de maintenance de la tronçonneuse

Figure 5: Formation pratique à la montagne de El Balda

Figure 6: Certificat de fin de formation de l'AVFA

4. B/Cas des communes a vocation oasienne

Le diagnostic de l'état des oasis révèle qu'elles sont confrontées à des défis environnementaux et socio-économiques de taille, que leur survie, est menacée et par conséquent, leur durabilité, que cela pèse sur leurs populations.

Le cas de Tataouine et spécifiquement la localité de Tlelt qui dispose un Oasis de montagne sur un superficie de 5 Hectares, au bout des ateliers des zones dans le cadre de l'élaboration du plan de développement locale de la commune de Tataouine Nord, parmi les priorisations des citoyens c'est l'aménagement des anciens oasis délaissés afin d'avoir une nouvelle génération des petites et moyennes entreprises dans les travaux oasiens.

4.1. Presentation du programme

C'est dans le cadre du projet IPDLI (BIT) en collaboration avec les acteurs locaux de la commune de Tataouine Nord du gouvernorat de Tataouine au sud de la Tunisie, un chantier école des travaux oasiens s'est déroulé dans une oasis de montagne au secteur de Tlelet, à environ 20 km de Tataouine vers Ghomrassen. Il s'agit d'une oasis ancienne encastrée entre deux montagnes sur terre collective appartenant à Arch Tlelet, longeant l'Oued de Tlelet, abandonnée à elle-même. Elle est gérée par un conseil de gestion élu.

L'oasis de Tlalet nécessite des travaux de réhabilitation surtout que les ressources hydrauliques sont propices à une exploitation riche du sol.

Un groupe de 10 jeunes ont été sélectionnés, en collaboration avec les services régionaux de l'emploi et les services techniques du ministère de l'agriculture, et ont été formés / certifiés sur les activités de l'agriculture oasienne.

Les sessions de formation pratique se sont déroulées dans l'oasis de Tlalet sur une parcelle de 4 ha de palmeraie en collaboration avec le GDA Tlalet.

4.2. Cadre institutionnel

Dans l'objectif de réussir cette initiative pilote, le Projet IPDLI n'a cessé de pousser la concertation entre les différents acteurs locaux afin de travailler en synergie dans une approche plurisectorielle.

De ce fait, chaque partenaire s'est engagé moralement de faciliter la tâche des responsables du projet et des apprentis en mettant à leur disposition tous les moyens logistiques nécessaires à cette initiative pilote.

- Les autorités locales facilitent l'information des apprentis du projet de formation à travers les Omdas et les associations existantes.
- -L'Agence Nationale pour l'Emploi et le Travail Indépendant (ANETI) : entant que structure d'appui et d'accompagnement des promoteurs pour la mise en place de leurs entreprises dans le secteur Oasien.
- Le Commissariat Régional au Développement Agricole représenté par son Arrondissement de la Production Végétale à l'échelle régionale,
- -L'Agence de Vulgarisation et de la formation Agricole (AVFA) : la structure chargée de la formation et de la validation de l'apprentissage et de l'activité à travers les deux centres de formation agricole de Deguech (Gouvernorat Tozeur) et celui de Gordhab (Gouvernorat de Tataouine).
- -L'Union Générale des travailleurs Tunisiens (UGTT), la principale centrale syndicale de Tunisie n'a cessé, depuis sa création, de soutenir les travailleurs tunisiens, d'encourager les initiatives de création de l'emploi pour les jeunes.
- L'Union Tunisienne de l'Industrie du Commerce et de l'Artisanat (UTICA), l'organisation patronale nationale qui représente les entreprises du secteur privé.
- -L'Union Tunisienne de l'Agriculture et de la Pêche, comme son nom l'indique c'est l'organisation nationale indépendante qui représente les professionnels du secteur primaire du pays.
- -Le Groupement de Développement Agricole (GDA) ou Groupement à Intérêt Economique (GIE) :

Le groupement, quelle que soit son intérêt, sera le support social et économique aux apprentis pour développer et épanouir leurs activités dans le domaine oasien.

4.3. Beneficiaires du project

Les bénéficiaires sélectionnés doivent répondre à un certain nombre de critères :

- Être originaire de la communauté de Tlelet,
- Être âgé entre 18 et 50 ans,
- Être en chômage,
- Avoir un niveau d'instruction lui permettant de lire et d'écrire,
- Être en bon état de santé et ne portant aucun handicap pour travailler dans le domaine oasien et surtout être capable d'escalader les palmiers,
- Être sérieux et disponible tout au long des séances de formation,
- Avoir un minimum de savoir-faire sur les travaux oasiens,
- Être capable de travailler en étroite collaboration avec ses collègues pour créer une structure socio professionnelle dans leur localité,
- Être capable de négocier avec les grands exploitants phœnicures les marchés d'entretien de leurs palmeraies.

4.4. Apprentissage: formation modulaire et pratique

Le montage institutionnelle à permet la contribution de chacun de ses acteurs pour réussir une formation pratique à l'oasis de Tlelet sur un superficie de trentaine de Hectare et de réserver des parcelles démonstratifs selon une autorisation préétablis avec la communauté , l'Agence nationale pour l'emploi et le travail indépendant à bénéficier les jeunes d'un bourse mensuel à raison 200 DT et les frais de l'hébergement et la formation technique au niveau du centre de formation agricole selon une convention signé dans le cadre de cette intervention conjointe entre l'AVFA et l'ANETI .

La couverture sociale et l'assurance accident de travail parmi les acquis aux jeunes apprenants de cette convention pendant toute la formation.

Table 3: Répartition annuelle des activités oasiens

	Jan	Fév	Mar	Avr	Mai	Juin	Juil	Aout		Sept	Oct	Nov	Déc
Travaux d'entretien de la palmeraie													
Entretien des régimes de datte et protection													
Protection phytosanitaire d'une oasis													
Cultures sous étages ou cultures intercalaires dans une oasis													
Récolte, emballage et transformation des fruits (dattes)													
Plantation de palmier													
Elevage et production animale dans les oasis													

Figure 7: Elagage des palmiers bien venant

Figure 8: Abatage et faconnage d'un palmier non productif

5. Formation entrepreneuriale et elaboration pour les jeunes beneficiaires de la formation technique

5.1. Formation collective

L'objectif ultime étant d'améliorer de manière durable les performances des porteurs de projets et de leurs entreprises au sein de l'environnement économique et social dans lequel ils évoluent, les bénéficions de coaching et de formation, qui leurs permettront d'accéder activement à un grand nombre de compétences pour créer et exploiter une entreprise prospère, seront essentiellement axées sur :

Des objectifs comportementaux à travers l'engagement des porteurs de projets dans le développement de nouvelles compétences humaines, la formulation des plans d'action opérationnels et leur mise en application.

Des objectifs cognitifs d'apprentissage et d'assimilation des principes et outils de la création et de la gestion de leurs PME, favorisant ainsi la mise en application immédiate de cet acquis.

Des objectifs affectifs qui consistent à montrer en quoi l'utilisation de ces connaissances peut aider l'entrepreneur.

5.2. Coaching personnalise pour la conception des plans d'affaires

Afin d'assurer un développement des compétences managériales et des plans de commerciales à l'élaboration des plans d'affaires pour les sensibilisés à l'étude économique et financière, des analyses et appréciation des indicateurs de rentabilités et des ratios et le plan d'exploitation et le plan financier.et la gestion des ressources humaines.

Des séances de réajustement et des propositions des pistes d'amélioration des plans d'affaires. Une stratégie de collaboration dans chaque groupe a été concertée et validée avec les bénéficiaires finaux et les partenaires stratégiques et l'équipe de projet.

5.3. Accompagnement personnalisee pour la formalisation des activites et la creation des entreprises et coopérative spécialisées dans les travaux verts

L'entreprise des travaux forestiers exige obligatoirement des closes techniques selon le code forestier de la république Tunisienne pour rependre à des exigences mentionnées dans un cahier de charge retirer de la direction générale des forêts, Deux jeunes promoteurs dans une femme ont répondu à ses exigences et ont terminer le processus de la création de leurs entreprises dans un cadre formelle et légale.

Les deux entreprises crées seront accompagnées et formé sur le thématique de la passation du marché pour qu'ils puissent participer dans les consultations ou bien les marchés publics de la Direction Général des forêts.

Figure 9: Deux patentes des deux entreprises spécialisées dans les travaux verts

L'élaboration des plans d'affaires spécifiques au activités économiques verts annexés par des fiches d'activités développe l'esprit entrepreneuriale chez les jeunes et les femmes dans le milieu rurale de s'installer pour leurs propres comptes et génèrent des revenus afin d'améliorer leurs conditions de vie.

La formalisation et la restructuration des activités des jeunes est l'une des étapes le plus importante dans ce dispositif vu que les bénéficiaires s'orientent vers l'instauration d'une structure socio-professionnelle dans le cadre de l'économie sociale et solidaire, l'incubation de cette structure sera dans les locaux de la direction générale des forêts (les postes forestier).

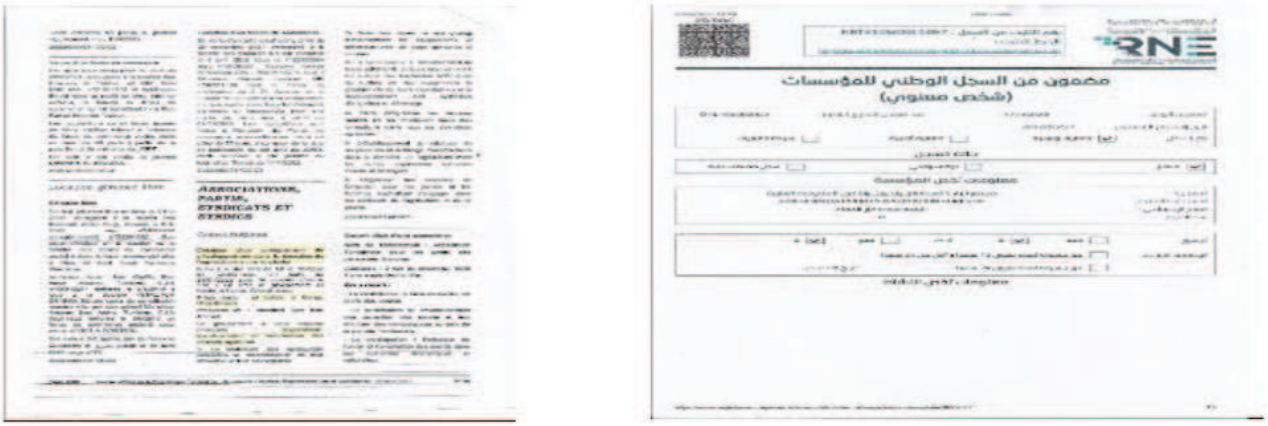

Figure 10: Dossier juridique d'une coopérative forestière crée dans la localité de el Balda

6. Lecons apprises et recommandations

Afin d'assurer une exploitation durable et rentable du potentiel forestier et oasien, il est proposé ce qui suit :

- Arrêter un programme de formation en main d'œuvre qualifiée dans l'exploitation et les travaux forestiers et oasiens.
- Vu les difficultés de recrutement dans la fonction publique pour les prochaines années, il est proposé ce qui suit :
  - Encourager de plus en plus l'exécution des travaux forestiers à l'entreprise.
  - Engager un dialogue avec les industriels et les entreprises d'exploitation forestière pour se préparer à la vente du liège sur pieds à compter de la compagne 2025 à cause des moyens humains limités de l'administration.
- Accélérer l'élaboration des plans d'aménagement pour les forêts non couvertes.
- Encourager les initiatives de création d'entreprises forestières.
- Accélérer l'amendement du code forestier
- Réviser la réglementation des marchés publics dans un objectif d'une meilleure implication des entreprises nouvellement crées (à l'instar du décret 676 du 13 juin 2016 relatif aux marchés du gré à gré avec les petites et moyennes entreprises).

6.1. Mais encore, sur terrain il convient de:

- Faire face aux ralentisseurs du changement : faible coordination entre les services déconcentrés, bureaucratie, multiplicité des cadres juridiques, etc.
- Renforcer la culture collaborative entre les différents acteurs au niveau local, régional et centrale.
- Adopter des approches centrées sur l'humain.
- Territorialiser les interventions : valoriser les facteurs locaux du développement, développement des chaines de valeurs locales, favorisés l'émergence d'un environnement propices à l'émergence d'opportunité de création d'emploi décent, etc.
- Renforcer, dans l'action, les compétences des partenaires institutionnels

7. Conclusion

Cette initiative pilote pour l'instauration d'un dispositif de gouvernance locale dans un contexte rurale pour la formalisation des travaux agricoles, forestiers et oasiens basés sur des données sectorielle à haute potentiel de valeur ajouté.

L'objectif principale c'est la conservation des moyens de subsistance et la résilience des groupes vulnérables ; les jeunes et les femmes représente un défi pour un développement locale intégré. Les principales réalisations : Trois chantiers verts sont réalisés au profit d'une trentaine des jeunes et des femmes, les taux de réussite pour la validation de l'apprentissage des jeunes est de 100 %.

La moitié des jeunes bénéficières ont finalisé leurs plans d'affaires dont 100 % des idées des projets ont était validés par un comité régional d'évaluation technique.

Et afin de garantir la durabilité des activités, les jeunes sont organisés dans trois groupements de développement agricole (coopératives) pour faciliter l'accès aux marchés publics dans le domaine des travaux forestiers (Reboisement, Bucheronnage, Démasclage de chaine liège, Conservation des Eaux et du Sol, etc...) et oasiens et bénéficier des concessions allouées dans le cadre des procédures de passation du marché en Tunisie.

Notes

Contractor excellence scheme (CES) as a contractor and employment promotion tool

Albert Uriyo

10

Contractor Excellence Scheme (CES) as a contractor capacity and employment promotion tool

Albert Uriyo

Sub-theme: Skills and competencies for transformative infrastructure and sustainable livelihoods

About the author

Albert URIYO is since May 2022 the Project Manager for the EIIP Afghanistan Project, based in Mazar-I-Sharif. He was previously the Project Manager for the Enhancing Rural Access (ERA) Agro-Forestry Project in Timor-Leste from November 2017 to April 2022 and ILO Officer in Charge (OiC) Head of Mission Timor-Leste from October 2018 to April 2022. Prior, Albert was the ILO Training Advisor to the Infrastructure Sector of the Expanded Public Works Programme in South Africa from July 2012 when he joined the ILO. In realizing ILO's mandate of Decent Work for All, Albert has been primarily involved in employment creation, skills and capacity building interventions.

In the last 30 years, Albert has worked and practiced widely in implementation of employment – intensive programmes, capacity building, contractor development, advisory services, procurement and infrastructure delivery spanning several countries. Besides planning, procurement, delivery and management of infrastructure and employment intensive investment programmes, Albert has been involved in design, development, delivery and evaluation of training programmes, consultancy assignments, publications, resource to several seminars and workshops and several papers related to contractor training, development initiatives, employment – intensive programmes and contracting aspects.

Albert, a Tanzanian national, is a Civil Engineer by profession, Certified Trainer and Certified Evaluation Manager who holds a Master in Business Administration (MBA).

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CONTENTS

Abstract

Infrastructure delivery, whether through contractors or other modality, has great potential for employment promotion. However, development of a sustainable capacity of labour-based contractors presents a challenge, owing to the need for a myriad of interventions. As we seek to promote employment through infrastructure delivery, there is need to foster not only contractor capacity, but also employment promotion. Added to this, is the challenge to encompass not only traditional performance indicators of capacity development, but also local context, performance, growth of contractors, and other socio-economic objectives.

The paper proposes for a contractor capacity and employment promotion model, adopted from quality management good practice, that involves a Contractor Excellence Scheme (CES) which besides training, integrates a recognition and award scheme as a self, peer, and mentoring assessment tool for evaluating and improving contractor performance. Further, the tool motivates contractors to promote decent employment. The model recognizes contractors who have performed; facilitates continuous performance and growth of the contractor and promotes and documents good practice including employment promotion.

The Paper outlines the impending challenges in contractor development and employment promotion that prompted development of CES. The framework and implementation modalities for CES are further defined. CES integration to other interventions such as training, coaching, mentoring, and employment promotion are charted out. The challenges and lessons learnt during the pilot phase are also explored. The paper also recommends for the adoption of CES as a capacity development and employment promotion tool.

Keywords: Capacity Development, Contractor, Employment, Recognition

1. Introduction

Infrastructure development is usually a daunting task, with competing pressures as infrastructure seeks to embed itself in nature, while at times seeming to battle mother nature. Delivery is usually associated with many expectations, usually with constrained resources, limited time, and the demand to comply with several specifications and requirements, all of which demand significant contracting skills and experience. Within this, is the established fact that well-designed and implemented infrastructure projects have significant potential to provide employment.

A typical small to medium contractor faces several challenges related to skills, access to works, finance, equipment, and the enabling environment. Sustainability increasingly demands for incorporation of socio-economic objectives such as employment. The need to nurture competent contractors to do this is apparent, but which involves a myriad of interventions. Depending upon the context, this may entail a holistic programme involving training, capacity development, coaching and mentoring among others. However, a challenge arises in linking the output of these contractor development interventions to the actual contractor's performance.

The Contractor Excellence Scheme (CES) is a contractor capacity development and employment promotion tool developed from quality management good practice. It evaluates contractor performance; recognizes contractors who have performed; facilitates continuous performance, growth, promotes employment and documents good practice among contractors.

2. Contractor's development and the employment paradox

The construction industry is an important sector of the economy (Hillebrandt, 2000). Many countries invest in infrastructure as a strategy to promote economic development, as we observe significant expenditure being directed towards infrastructure development. It is this significant expenditure which provides a fertile opportunity for employment promotion. In turn, there are many players including contractors who are attracted owing to the huge capital flows. The construction industry involves many people with diverse interests, talents, and background with Bennet (2003) observing that the contractor plays a major role as it is the contractor who carries the lead responsibility for on-site installation work and the associated planning and follow-up.

The erratic and sometimes cyclic flow of funds require committed and resilient contractors who have the potential to grow, otherwise many who enter do not survive. It is thus strategically important to have in place a cadre of competent local contractors in a nation's sustainable development, through structured contractor development interventions that consider the money flows, numerous players, erratic flow of jobs and absence of support structures such as access to works, finance, equipment, and enabling environment. It is particularly relevant to ensure that funds spent, besides producing quality, timely and value works may also be leveraged to enhance socio-economic objectives such as creating decent employment, income support, social safeguards and sustainable livelihoods within business and construction practice principles.

However, the paradox is that at times, at the expense of quick delivery which can result in reduced costs, employment creation is not considered by many planners, and construction practitioners.

Besides promoting employment and capacity building, Employment Intensive Investment Programme (EIIP) projects seek to adopt innovative approaches to facilitate capacity building of competent contractors who could deliver the traditional performance and financial indicators of quality, timely delivery, value infrastructure, profit and yet deliver the socio-economic objectives such as employment etc. Contractor development, similarly, to development of any business requires a multi-faceted approach as besides technical competency, contractors need business competency. The challenge is in developing a holistic approach that encompasses traditional performance indicators but can also influence the contractor to pursue continuous performance and growth and at the same time promote employment and other socio-economic objectives.

It is this challenge that led to an initiative within the EIIP projects, piloted within the Enhancing Rural Access Agroforestry Project (ERA-AF) and funded by the European Union (EU) in Timor-Leste. The scheme is now being rolled out in the EIIP Afghanistan project funded by the Special Trust Fund for Afghanistan (STFA) in Mazar, Afghanistan to develop, pilot, customize and now roll-out the Contractor Excellence Scheme (CES).

CES is a model that has been adopted from the South African Construction Excellence Model (SACEM) with significant adaptations to suit the local context. The scheme essentially embraces the concept of a total quality management framework. CES is inspired from good practice where recognition and motivation has been used in several countries including Malaysia, Singapore and South Africa to spearhead performance improvement. CES forms part of continuing process among EIIP projects to seek the development of good practice tools that can stimulate employment whilst considering development, growth, and performance improvement of the implementors – the contractors by integrating training, coaching, mentoring, capacity support and employment promotion interventions.

3. CES linkages to contractor development and employment promotion interventions

A scoping study undertaken on Contractor Business Development in Timor-Leste (Anderson, 2018), identified among others the need to have a holistic framework that integrates classroom training, mentor support and coaching and peer-learning sessions. The specific recommendation called for development of an overall curriculum/framework for the business management training programme that ensures linkages in classroom training, business support and coaching. It was determined that effective business development involved experiential learning where classroom training was to be supported by contractors learning from amongst themselves and from others.

The tendency for many contractors is to seek quick delivery and cut down costs, hence preferring machinery and automation, which involves less intensive management of people and ultimately limiting employment.

The CES scheme integrates these four components as the CES assessment, evaluation and results criteria supports employment promotion, the business training curriculum, mentor support and coaching. This is complemented by peer-learning sessions integrated within CES which encourages contractors to benchmark against others, and so learn from others, though in a competitive environment. This is tied to assessment of traditional indicators of quality, timely delivery, value for money and profit, but also embraces other total quality management aspects including socio-economic aspects such as employment promotion. Implementation of CES has embraced recognition, to motivate contractors to perform well, deploy good practices, innovation and embrace improvement which is documented and used to provide feedback to other contractors and stakeholders, as shown in Figure 1 below.

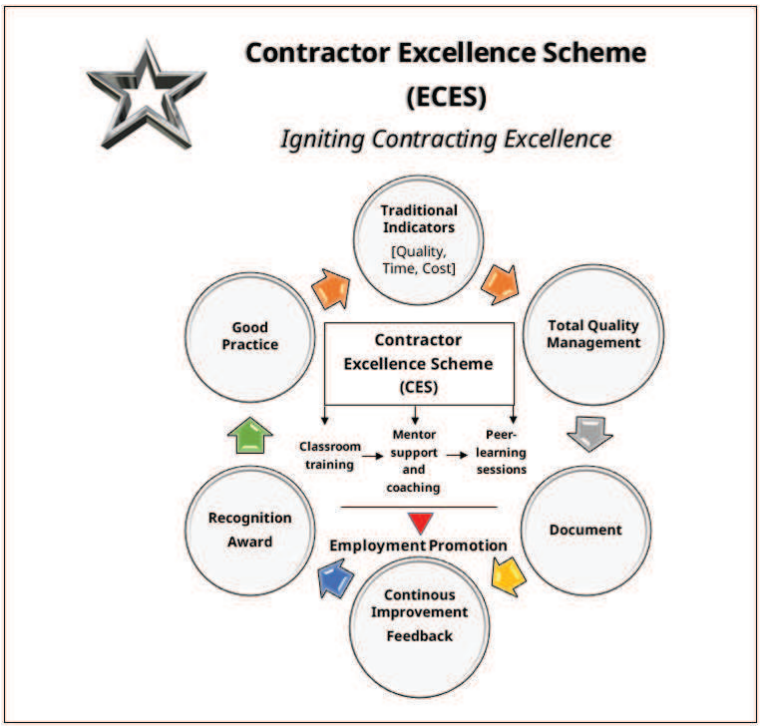

Figure 1: CES linkages

4. CES framework and implementation modalities

CES seeks at promoting continuous good practices, performance improvement, development, employment and growth and was initiated as part of the strategy of the ERA Agro-Forestry Project in Timor-Leste to capacitate contractors in employment promotion while implementing trial contracts under real life conditions. It is practised by:

- promoting and encouraging contractors to deliver quality infrastructure, efficiently through good practice and building upon structures laid through training, coaching, mentoring and performance improvement
- documenting, disseminating best practice and contractor development initiatives.
- encouraging contractors to measure performance and benchmark against others
- inculcating competitive spirit through recognition and awards, where contractors will continuously strive to upgrade their performance to achieve excellence.
- promoting decent employment-intensive approaches and principles during implementation.

The approach as it was in Timor-Leste entailed the contractor being provided with technical training on labour-based methods, business and contracts management and field training through a structured and accredited 12 weeks course. There is flexibility in the approach as it may also involve an existing and established contractor being provided with a short orientation training as it is in Afghanistan. The contractor is then involved in actual contract works. In the case of Timor-Leste, it involved a trial phase of between 5 to 6 months where the contractor is then given a road project to implement as part of the experiential learning phase. In Afghanistan, pre-qualified contractors with orientation training bid for labour-based works, without a guarantee of securing works. The CES framework kicks in at the beginning of the training as the assessment criteria including employment promotion are integrated into the training curriculum covered in class. CES is then applied to the contractor after successfully completing the classroom, field, or orientation training, with information on CES also provided to the contractor. Contractors undertake a self-assessment based on a set of pre-agreed criteria, which is later validated by a coach/mentor and which can be benchmarked against peers.

The 8 criteria as shown in Figure 2 are based on a set of drivers [business attributes; resources management; safety, health & environment], processes [tendering and construction procedures] and results [performance & growth; site-performance, client satisfaction and cross-cutting aspects] derived from principles of 'best practice' and total quality management as triggers and influencers for contractor's exemplary performance. A score is used to weight the criteria, based on a perception of the Criteria's influence to the contractor's performance. A guideline is also issued to assist the contractor in the process by identifying the various aspects to be assessed. This may be translated into the local language for comprehension, as was in Timor-Leste.

Employment promotion is primarily assessed under a cross-cutting criterion which assesses job creation, gender inclusiveness, and other social aspects including innovation and technology. However, various aspects related to employment promotion are also included among the other 7 drivers, processes, and results performance criteria.

CES also provides for continuous performance improvement, through a feedback mechanism that enable contractors improve future performance. Following the self-assessment, the contractor submits the self-assessment to the coach/mentor who in-turn undertakes an assessment of the

contractor. This allows an objective feedback mechanism to be introduced to the process as points of departure are noted with guidance provided on how to achieve better performance. These interventions are undertaken as part of the coaching/ mentoring support during the capacity development stage.

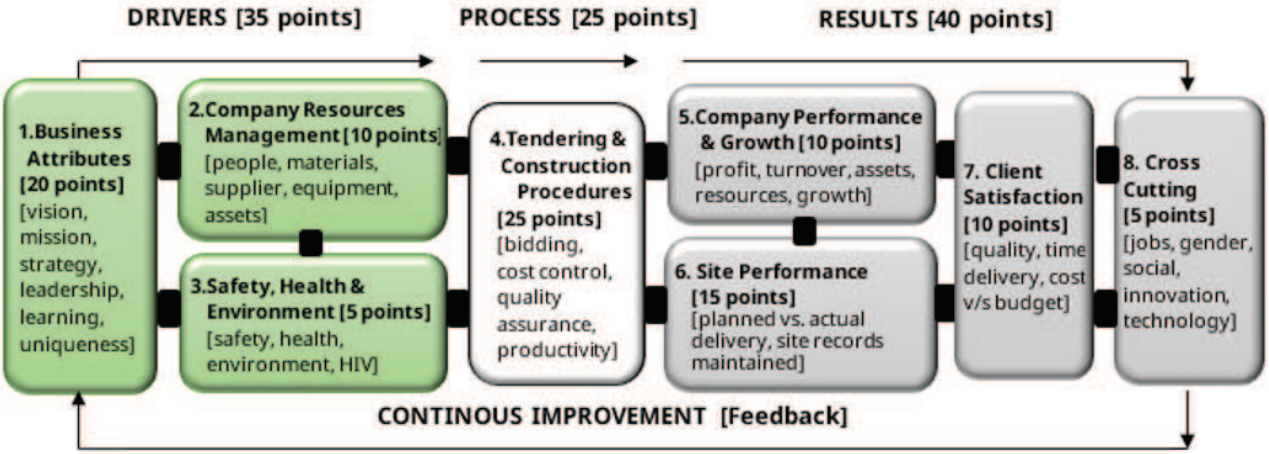

Figure 2: CES assessment criteria

To provide for a fair, objective, and balanced assessment and evaluation, there is formed an Award & Recognition Scheme Committee which comprises members from the project, training center and business community. The committee is responsible for the operations of CES during the award phase and may have the project as its secretariat.

Contractors may apply for the award after they have completed the classroom and field and substantially completed at least 75% of the period of trial contracts, following which an assessment is made by the Committee. The Committee will use information provided by the Coaches and Mentors prior to their assessment and will supplement it with an assessment made at the 75% period and end of the project. The 75% threshold is provided to encourage contractors to perform well and be able to distinguish the exemplary performers. Evaluation is carried out by the Award Committee based upon detailed assessment guidelines and scoring sheet based on a point system. The detailed evaluation is determined by both the information submitted and physical verified details and site visits made and scored on a scoring sheet. Efforts are also made to ensure that the assessment is not too prescriptive, but should rather be diagnostic, based on the nature of business as it puts into perspective the requisite contractor's requirements for competency.

In Timor-Leste, an ERA-Agroforestry Contractor Excellence Scheme (ECES) was implemented through a joint team involving Institute for Business Development Support (IADE) who coordinated business mentorship and Don Bosco Training Centre (DBTC) who coordinated technical mentoring. Contractors were assessed and ranked, through various technical and mentorship visits to offices and the field. Engagement was made during the period of project implementation; feedback was provided to the contractors and follow-ups made in subsequent visits. Summary details for each contractor were provided in the Assessment Report, together with business and technical scores, with the outcome being an overall assessment.

The CES framework seeks to motivate, recognize, and also award those contractors who excel. In the case of ERA-AF project in Timor-Leste, 3 awards were promoted by the scheme including: Best ERA-AF Contractor for the Year (1st Winner), Best ERA-AF 1st Runner-up Contractor of the Year (2nd Winner) and 2nd Runner-up Contractor of the Year (3rd Winner). The awards included: certificate of recognition & award souvenir; eligibility to use the award title e.g. "Best ERA-AF Contractor Year 20xx" in letter heads; Other incentives included preferential awards of annual maintenance contracts [based on compliance to procurement requirements] to the 3 best performing contractors, award of gift voucher of tools/ machinery used for construction and which were within control of the project. In the case of Timor-Leste, when the project was requested by other partners and other infrastructure projects to recommend contractors, recommendations were made based on the CES and which allowed several contractors opportunities to access works based on their performance. In addition, the award winners were accorded publicity, visibility and documentation was prepared on the distinguishing aspects of the award winners which were used to motivate other contractors.

As regards financing CES, operating costs include organization and establishment costs, orientation, and training for award committee members on assessment modalities, facilitation costs for award committee when on visits and the award organization and prize costs. The secretariat normally carries out the evaluations as part of the project monitoring activities and the committee would be providing guidance, to minimize the costs. To begin with, so as to promote CES and encourage participation, entry could be free. As the award gains acceptability and recognition, participation costs could then be charged on a gradual recovery basis until CES could support itself financially through sponsorship. The various phases are illustrated in Figure 3 below.

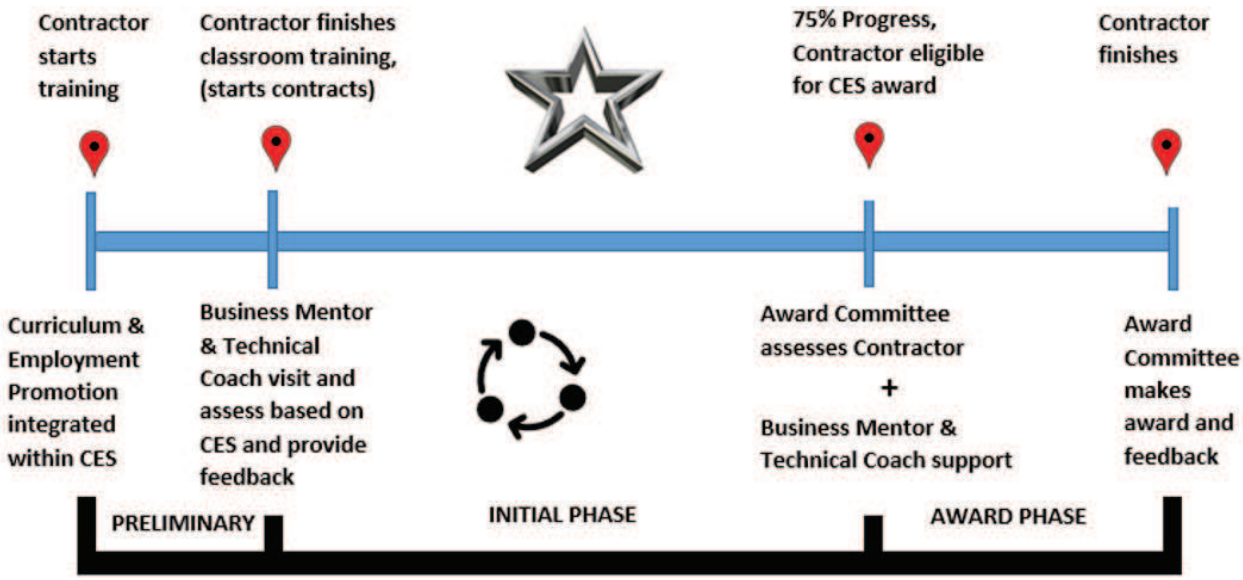

Figure 3: CES timelines

5. Lessons learned and implementation challenges

The CES was implemented through three batches of ERA-AF contractors in Timor-Leste since October 2018. Efforts are being made to roll-out the programme with the necessary fine-tuning in the EIIP Afghanistan project. Various lessons have been learned and implementation challenges faced within the period of implementing CES including:

- There has been need to revise the mode of administering the CES which was initially done solely through a business mentor, following the realization of the need to separate the technical issues such as [safety, health and environment; tendering and construction; cross-cutting] from the business-related aspects [business attributes; resources management; performance and growth; and client satisfaction]. This separation into technical and business-related aspects ensures that the necessary support is given through the requisite expertise; a business mentor who is well acquainted with construction practice and a technical coach who is well experienced with construction related technical aspects. Combining has not resulted in the desired outcome.
- It has been challenging to identify business mentors who have combined knowledge of business and construction practice, and who can relate the business aspects to the technical aspects. For instance, it is quite challenging for the business mentor to determine the adequacy of a contractor's work plan and advice accordingly if they cannot properly articulate the appropriate activities, risks, and resources, which require some basic technical knowledge.
- For CES to be successful and be seen as a valuable tool to the contractor, it is very important for the business mentor and technical coach to gain trust and confidence of the contractor. The contractor should see that CES is not the project spying into the affairs of the contractor, or that it is just another form to fill, but CES rather is a mechanism which if used correctly can identify contractor's challenges and address them adequately. There is thus need for sufficient engagement with the contractors to buy-into and accept the scheme and for them to provide feedback which will ensure that the expertise provided is valuable and enriching.
- Integration of employment promotion requires deliberate efforts, including sensitization, awareness, provision of relevant guidelines, norms and practices to enable desired outcomes.
- There is potential to motivate innovative approaches and practices. In Afghanistan, where women are being restricted from working on sites, efforts are being made through CES where women may be able to produce construction materials at home eg. weaving of gabion baskets to enable gender participation and inclusiveness. This is in line with sustainable procurement practices, which seek to integrate socio-economic dimensions within procurement processes.
- The application and design of the scheme depends on the maturity of the industry in the country and there would ideally be differences, as has been seen comparing Timor-Leste and Afghanistan. There is thus the need to adapt the programme to country context, to enable practical application.
- After the piloting, it is apparent that there is need to continue customizing the tool to recognize the local context of doing business which may not necessarily be contingent to global best practice. The social networks in Timor-Leste and Afghanistan play a strong role in facilitating business, with cultural practices also influencing business decisions.
- Simplification of CES is key in enabling its wider acceptance and application. The original SACEM model has 11 assessment criteria and 221 indicators, which were simplified

to 8 assessment criteria and 77 indicators in the initial CES programme. Indicators were later further simplified to 46 (26 for the technical aspects and 20 for business aspects). There is still further need to continue simplifying the criteria to consider strong influencers for contractor's performance and growth. Efforts are being made to further simplify the CES in Afghanistan.

- Interesting outcomes are documented during implementation of ECES as shown in the Case Studies below, which are extracted from real life cases observed during implementation of the contracts, and which are used during training to motivate contractors through peer learning, benchmarking, avoidance of pitfalls and embracing of good practice. Pseudo names are used to protect the real identity of the contractors.

Case study #1

Case Study

Inclusiveness and Returning to the Communities

Corporate Social Responsibility (CSR) may seem to be a far-fetched word, but it is part of what each business should do whether big or small. This involves giving back to the communities that we are working, by not only building the infrastructure, which is paid for by the client, but going beyond and using own funds to provide an essential service or asset to the community, based on the profit that one got from implementing the works.

MateMoris Unip.Lda offered to spot improve a section of road at own cost and outside scope of works, together with some additional works. 'When asked why they did it, they responded that the Community gave to me when I was young, and this is my way of returning to the community'. This is an expression of gratitude that was greatly appreciated by the community, and for which the community poured many blessings upon the contractor.

It is also interesting to note that while inclusiveness is a requirement within the project, women contractors have got a higher affinity for realizing gender inclusiveness than male owned contracting firms, except for a few outliers. This remains a challenge for men owned contracting firms to embrace inclusiveness for gender and people with disability with passion.

Case study #2

Case Study

Managing Resources is Instrumental to Successful Delivery

Study of the happenings in one of the trial roads reveals how contractors who did not either plan well and manage their resources well, suffered losses, despite efforts to coach and steer them in the right direction.

A case in point is of **Contente Unip.Lda** who incorrectly estimated the amount of gravel needed, and dumped more material on site, and when asked, insisted that he can cover the losses. Another Dokorai unip.Lda negotiated for a trip of gravel at USD 9 per trip without agreeing the cubic meters of gravel, and the suppliers did not supply full loads as they claimed it was difficult climbing with a full load, and the contractor suffered losses. In another case, **Elefante Unip.Lda**, did not communicate well between the Director and Engineers as the Director while entering into agreements for the trucks, did not provide authority to Engineers to manage the trips and it led to losses.

Fatukama Unip.Lda frequently changed technical staff, which led to delays in implementation, and re-training. Absence of director involving technical staff in the various negotiations led to implementation challenges as the technical staff many times worked without knowing the terms of engagement e.g., what happens when there is rain and no work. All these various problems later led to failure to implement the works.

Labor is a very important resource and needs to be managed carefully. If labor is not managed well it can lead to distrust with the Contractor, such as the case of Gugulai Unip.Lda who did not pay workers in time, and which led to workers refusing to work for the contractor, and even when the Contractor offered to pay more, and which later led to failure to implement the works.

Using the money paid for in a Contract for the intended purpose and according to your Cash Flow is very important. **Hadulas Unip.Lda** in addition to

the advance payment provided in the contract took a loan and did not put the money into the Contract. A couple of the months down the line, there was no progress and the Contractor claimed it had no money. This later led to the Contractor failing to implement the contract and being terminated.

Trust is an important consideration. Inocente Unip. Lda was a competent technical person and director, but who because was technically qualified was too confident that he could do everything by himself, and thus it was difficult for other technical staff to stay with him. As he had other jobs, this later led to a situation where he could not be at several places at the same time, and which led to him failing to implement the project.

Most of the Contractors do not make use of the tools that are there to control resources. Contractors such as **Jagoan Unip.Lda** who make effective use of the tools such as Work Plan, Resource Plan and monitor them and make revisions are able to control resources and ensure that they implement the works on time, to the appropriate quality and also within affordable cost so as to make a good profit.

6. Conclusions and Recommendations

The paper has outlined a contractor assessment, recognition, performance improvement and employment promotion tool. After initially being piloted in Timor-Leste, the Contractor Excellence Scheme (CES) tool is currently being customized and developed in Afghanistan as a self, peer and mentor assessment and promotion tool to evaluate contractor performance; recognize contractors who have performed; facilitate continuous performance and growth of the contractor while promoting employment and documenting good practice among contractors. There have been interesting lessons learnt and feedback that can greatly contribute towards further improvement of the model.

Though just piloted, it is seen that the tool if well operationalized has potential for contractor development, employment promotion together with its wider adoption with recommendations made below:

- CES has great potential for adoption as a capacity development and employment promotion tool, owing to its integration and linkages with other capacity development and employment interventions. CES initially targets contractors participating within different EIIP Contractor Capacity Building Programmes but has potential to be expanded to an industry wide initiative to promote contractors and also be modeled to support other businesses after pilot-testing and roll-out. The model can also be expanded to include other existing contractors and include other categories such as best decent work employer etc., safety compliant, that further promote decent work. Upon successful piloting of the scheme in Timor-Leste, CES was handed over to the Chamber of Commerce and Industry Timor-Leste (CCI-TL) to use as a tool in contractor and business development. There is feasibility of incorporating a nomination process where other parties e.g., clients, supervisors and other stakeholders may nominate. This is done to create a wider opportunity for recognition from both self-assessment and external recognition.
- In adopting CES as a capacity development and employment promotion tool, there are however as always inherent risks which includes: non-acceptance and support from the various stakeholders in the scheme. This can be mitigated by the scheme being transparent (fair, open, clear in relation to criteria for success/ judging, accessible in the public domain) and the processes of the schemes being available in the public domain.

- EIIP projects should seek to implement a performance assessment framework for all contractors, which may be used to assess and improve performance and promote employment. The scheme needs to be continuously relevant to contractors. This could be done through added points in future tenders etc. The scheme should target holistically contracting firm's 'best practice' and 'overall performance' and not the performance of individual persons, or traditional performance measures such as those based solely on financial indicators e.g. profit, or cost, time and quality measures alone. The scheme should not just be seen as just as a recognition or award scheme, but rather a process that recognizes and stimulates continuous improvement and performance for the whole contracting firm, supporting organization and encourages employment.

- There is also need for CES itself to be evaluated at set times, for example, every second year, to guarantee that the scheme is meeting its set objectives and that the participants are benefiting from involvement in the scheme. There should also be in-built quality controls to ensure set objectives are realized. Safeguards such as maintaining certain standards and monitoring should be incorporated to ensure that award winners also do not abuse the title. This together with the commitment from the organizers will ensure that CES is continuously relevant, dynamic and able to achieve the intended objectives.
- To provide for financial sustainability, CES could seek for sponsorship support from stakeholders in the industry. This could be realized based on the value that CES would bring to the whole contracting industry, through improved and better practice and performance. This may serve to sustain its future operations and enhance the management of the scheme. In the event CES is sponsored, there should also be transparency in use of funds, by ensuring adequate preparations, reporting and making available financial statements on the running of the scheme.
- There are other avenues that may be used to further promote employment within the scheme, such as integrating employment not only under cross-cutting performance criteria, but within the other assessment criteria eg. business attributes, resources, OSH, construction procedures, company growth, performance, and client satisfaction. Another option may involve increasing the specific points for the employment promotion indicator within the cross-cutting assessment indicator.
- With efforts globally and within the EIIP to embrace sustainable procurement, the CES provides a platform that can facilitate not only contractor development, but also employment promotion, and be linked to sustainable procurement practices.

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Notes

Contribution of EIIP in promoting Humanitarian Development Peace Nexus (HDPN) and social cohesion: Perspectives and lessons from Baidoa, Somalia

Stephen Muthua

11

Contribution of EIIP in promoting Humanitarian Development Peace Nexus (HDPN) and social cohesion: Perspectives and lessons from Baidoa, Somalia

Stephen Muthua

Sub-theme: Employment intensive works in the context of fragility (natural disasters, conflict and refugee situations as well as economic decline)

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CONTENTS

Abstract

Key words: human development peace nexus, forced displacement, internally displaced persons, fragility, conflict sensitivity, employment creation, gender equity, capacity building

Declaration: This paper is original and has not been published before.

With the adoption of the landmark Recommendation on Employment and Decent Work for Peace and Resilience (ILO, 2017) and the launch of in 2017, the ILO has reinvigorated its mandate in the humanitarian-development-peace (H-D-P) nexus and fully equipped itself to contribute to more peaceful and resilient societies through the promotion of employment and decent work. The technical cooperation project "creating decent work opportunities for Somali IDPs, returnees and host communities through employment-intensive infrastructure improvement" in Baidoa, Somalia has been designed and initiated. The project is **co-financed by the German Federal Ministry for Economic Cooperation and Development (BMZ) through Kreditanstalt für Wiederaufbau (KfW) and implemented by the International Labour Organization (ILO), in partnership with the Federal Government of Somalia (FGS) and the Federal Member State (FMS) of South West State (SWS) of Somalia.**

The project aims to improve the socio-economic conditions for internally displaced persons (IDPs), returnees and host communities in Baidoa, Somalia through improvement of infrastructure, creation of employment opportunities and capacity building of public sector institutions and private sector actors.

The project is implemented using the ILO's Employment Intensive Investment Programme (EIIP) approaches- a response mechanism for mitigating risks and vulnerabilities associated with unemployment, poverty, and climatic shocks that adversely impact the population's wellbeing.

This technical paper presents the perspectives considered in project design and lessons from implementation, in creation of employment, expansion of economic opportunities, promotion of gender equity and inclusivity and social cohesion as important contributors to the Humanitarian-Development-Peace (HDP) Nexus.

Liste des Abréviations, Sigles et Acronymes

BDA	Baidoa District Authority
BMZ	Bundesministerium fuer Witschafliche Zusamenarbeit un Entwicklung (German Federal Ministry for Economic Cooperation and Development
CAP	Community Action Plan
CBD	Central Business District
CCCM	Camp coordination and camp management
CEF	Community Engagement Framework
COVID	Corona Virus Disease
CUS	Community Umbrella System
EIA	Environmental Impact Assessment
EIIP	Employment Intensive Investment Program
ESIA	Employment and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESS	Environment and Social Safeguards
ESSF	Environment and Social Safeguards Framework
FGD	Focus Group Discussion
FGS	Federal Government of Somalia
FMS	Federal Member States
HDP	Human-Development-Peacebuilding Nexus
I.A.s	Implementation Agreements
IDP	Internally Displaced Person
IFC	International Finance Corporation
IOM	International Organization for Migration
JRP	Jobs for Peace and Resilience
JPLG	Joint Programme on Local Governance & Decentralised Service Delivery
KfW	Kreditanstalt für Wiederaufbau (KfW Development Bank)
MoLSA	Ministry of Labour and Social Affairs
MOPWR&H -SWS	Ministry of Public Works, Reconstruction and Housing, South West State
PSC	Project Steering Committee
SNDF	Somali National Development Framework
SOP	Standard Operating Procedure
SWS	South West State
TOR	Terms of Reference

Executive summary

The technical cooperation project "creating decent work opportunities for Somali IDPs, returnees and host communities through employment-intensive infrastructure improvement" aims to create employment through rehabilitation and improvement of infrastructure in the district of Baidoa in Somalia. It uses employment intensive methods and will create a minimum of 217,000 workdays of employment for Internally Displaced Persons (IDP), returnees and host communities. The objective is improved and sustainable access to basic economic services, transport and employment opportunities. The strategy is to utilize employment intensive investment approaches, and conflict sensitivity to design interventions that will build social cohesion, promote inclusivity and catalyze economic activities. This strategy combines EIIP approach in the design, formulation, implementation of programmes aiming to address unemployment and underemployment through public investment, and the Humanitarian Development Peace Nexus (HDPN) or 'triple nexus' approach that one set of actions alone cannot solve the problem – and that humanitarian, development and peace actions all have a role to play. In this regard, the project analytical framework included not only the major needs of infrastructure, employment and economic opportunities, but more importantly, the context of the project in terms of fragility, cyclic conflict driven by competition over resources and climate change, weak institutions. The resultant design prioritizes conflict sensitivity and peace responsiveness in consultation, project identification, design, labour recruitment and management, and capacity building of public sector institutions and private sector actors. The project period was initially 3 years, 2020 to 2022, but due to delays arising from the COVID 19 pandemic, it has been extended for 1 year, up to December 2023.

The project institutional steering process comprise of a steering committee and a technical working group. Taking into account the context, the project was designed with two complementary components- infrastructure development and creation of employment opportunities through the use of employment intensive investment approach, and capacity building of the MoPW at State level (MoPW-SWS) and Baidoa District Authority in the institutional, technical and managerial aspects of infrastructure development and maintenance (planning, design, implementation, supervision/monitoring and evaluation) using employment intensive methodology, contractors and casual labourers (direct beneficiaries). The project targets vulnerable youth and women and men living in the IDP and returnee settlements, the host communities and staff from the Baidoa District Authority and MoPW-SWS as well as Contractors.

To-date, the project set up, initiation, planning and design has been completed, implementation has commenced, and initial results are visible and tangible. The planning comprised of a conflict analysis and sensitivity study, consultative identification of priority projects, technical design of 20 km of urban roads, a pre-qualification of local contractors followed by a procurement of the first 2 lots of contracts using e-tendering. The implementation has commenced with a selection of labour using a community umbrella system (CUS) and execution of the first two lots of infrastructure project comprising approximately 3.47 km cobblestone-paved roads is at 50% completion. The technical execution is accompanied by a capacity building process for public sector institutions- mostly project design and supervision engineers, and private sector entities- technical and managerial staff of contractors.

The technical design of the road infrastructure identified the use of local resources- cobblestone for paving, and local labour as the most important inputs. By using local cobblestone, the local value content of infrastructure labour and materials is forecast as approximately 40-45 % of

the value of infrastructure, which is injected into the local economy through procurement of materials and local labour.

The lessons learnt so far are that the use of local resource-based methods of infrastructure delivery, and innovations in information technology, with careful application of conflict-sensitive targeting, it is possible to enhance existing Somalia community resilience and build up a process that combines immediate humanitarian response, development and peace building.

1. Setting and Context

1.1. Africa context - The youth unemployment challenge

The 14th ILO Africa Reginal Meeting in Abidjan (ILO, 2019) noted that with 1.3 billion inhabitants, the African region today is home to a labour force that is almost 500 million strong (2019). Furthermore, by 2030, the size of the labour force will have grown to 676 million, a staggering 40 per cent increase, driven by the rapidly growing number of youth labour market entrants. The challenge for youth unemployment is significant: Africa is world's youngest region; and young people under 25 years old constitute 60 per cent of the population. By 2030, almost one fifth of the global labour force – and nearly one third of the global youth labour force – will be from Africa. The youth unemployment rate (age bracket 15–24) in all African subregions is higher than overall unemployment: it was estimated at 12 per cent (females) and 11.8 per cent (males) respectively, on average, in 2019. High levels of youth unemployment, underemployment and labour force underutilization are key drivers of labour migration within and outside the African continent. The majority of Africans do not leave the continent but move to neighbouring countries in the same subregion. In Africa, most countries are now simultaneously origin, transit and destination countries for migrant workers. African migrant workers, particularly women, are primarily concentrated in low- and semiskilled occupations in agriculture, construction, retail trade, mining and domestic work.

1.2. National context - Somalia

Somalia is a severely fragile and impoverished state, where decades of internal conflict and civil strife has demolished the economy and the delivery of essential services, costing countless lives. International jihadist movements, grievances among excluded and marginalized sub-clans and ethnic groups and common criminality have further impacted society. As a result, Somalia remains one of the most complex and protracted humanitarian crises in the world. About 70% of the population lives below the poverty line (UN OCHA, 2021), largely as a result of conflict, political instability, climate change and weak economic performance, with nearly half of the population not even being able to meet the average consumption of food items. The socio-economic situation of Somalia is among the direst globally, with unemployment rates of 21.4% or as much as 37.4% among youth aged 15-24 years old (ILO, 2019). The UN 2022 Humanitarian Needs Overview has identified 7.7 million people in need of humanitarian assistance – an increase of 1.8 million persons since the 2021 Humanitarian Response Plan (HRP).

Today, Somalia is one of seventeen countries categorized by the World Bank as "fragile and conflict-affected states", and only one of four countries globally categorized on the list of High Intensity Conflict countries (World Bank, 2022). The country is faced with high levels of insecurity varying across geographic locations. In south-central Somalia large parts of the country have not

been accessible to international humanitarian organisations, donors, and NGOs. The states inability to exert control throughout the country, provide security and basic services (combined with a lack of economic opportunities and the impact of extreme weather events), has led to, or has exacerbated different tensions and conflicts (Swisspeace, 2020). Majority of the population has no access to basic social infrastructure that are essential for their livelihood and the country is lagging in all measures of sustainable development goals (SDGs).

Somali migration patterns are complex. About 2 million people of Somali descent live outside the country (UNOCHA, 2022). Of these about 836,300 are refugees or asylum seekers with about 80% living in neighbouring countries like Kenya, Ethiopia, Yemen, and Uganda (UNHCR, 2019). Since 2014 about 130,000 refugees have returned to Somalia. A large diaspora lives in Europe and plays a significant role in investing funds from abroad – remittances made up 24% of GDP in 2015 and Somali households receive on average US$233 per capita each year in remittances, representing 37% of household expenditures (ILO, 2022).

Internally displaced persons (IDPs), amounting to about 2.1 million persons, have the highest rates of monetary poverty (FGS, 2020). Although women represent 56% of the population and generate up to 70% of household income, they are under-represented in the formal labour force. Over 80% of the population are younger than 35, with this group suffering from about 37.4% unemployment. A lack of opportunities and obstacles to education, has impacted women, IDPs and youth disproportionately, with poverty rates highest and socio-economic outcomes lowest in these groups and a direct link to the probability of radicalization for youths.

Somalia is vulnerable to natural disasters, climatic shocks and increasingly frequent and severe droughts which threaten the stabilisation and development gains. In 2020 vast swarms of desert locusts expanded from northern to central and southern Somalia. The resources of land and water are increasingly scarce, intensifying rural conflicts, and spilling over into urban areas. As of July 2022, over 80% of Somalia faces severe or extreme drought, leading to food insecurity and malnutrition (IRC, 2022).

1.3. Local context

Baidoa is a strategic town in South-Central Somalia and the interim capital of the Bay region of Somalia, situated approximately 250Km west of Mogadishu. The city is traditionally one of the most important economic centers in Southern Somalia, conducting significant trade in local and imported cereals, livestock, and non-food items. The combined effect of drought and on-going crisis in Bay and surrounding areas have had a harmful impact on economic stability and livelihoods leading to a chronic humanitarian situation and major displacement of population. Due to its geopolitical position, it is a major recipient of IDPs (both returnees and from neighbouring areas) and accommodates the largest populations of IDPs within the country.

Baidoa currently accommodates one of the largest populations of Internally Displaced Persons (IDPs) within the country. The humanitarian situation in Baidoa has registered major changes in terms of new displacements in the last 3 years, largely driven by adverse weather conditions and consequential food shortages The most recently available report from the CCCM Cluster Report (UNOCHA, 2021) on IDP site verification in October 2021 identified 572 sites hosting 68,634 households (HH)) or 475,035 individuals. Compared to the previous verification in April 2021, this was an increase of 24 IDPs, hosting 7,561 HH or 44,044 individuals. The consequences displacement include increase in urban population, high unemployment/demand for jobs and services, increased risk of conflict between the host communities and the displaced person, and attraction of youth the financial and social status associated with radicalization and crime.

Traditionally, IDP sites are located on land owned by host communities, who allow the IDPs to settle, under varying arrangements.

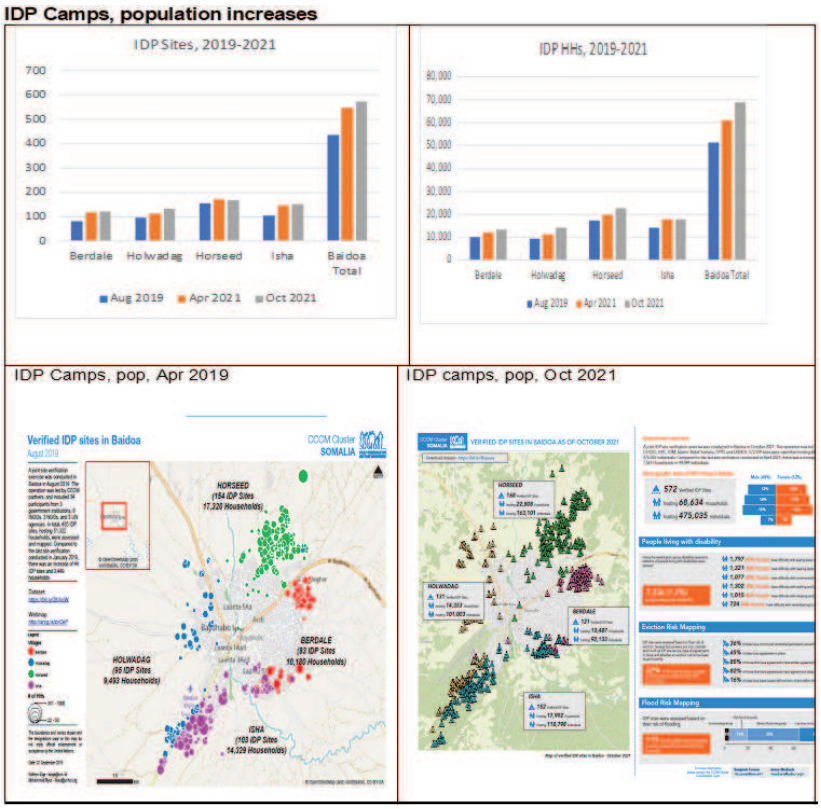

Figure 1: IDP camps, population increases, Baidoa

Source: UN OCHA, CCCM Cluster System

1.4. Analysis of key problems and challenges

The key problems are poor infrastructure, consequential lack or poor basic services, lack of economic opportunities, low economic growth, climate-related economic shocks.

Infrastructure and basic services in Baidoa are overwhelmed, and in some cases non-existent. Although in the Central Business District (CBD), the road network is organised in a grid, road access in the IDP settlement areas is haphazard. Most of the gravel surfaced main roads in Baidoa have deteriorated. In baseline studies all groups highlight roads as the most pressing need – especially IDPs who tend to live on the outskirts. The SNDP recognises infrastructure as a constraint to growth and highlights very limited funding, insufficient administrative and technical skills for managing large-scale construction and maintenance. In addition to conflict, climate-related shocks and insecurity, economic growth and livelihood opportunities in Somalia are constrained by poor physical infrastructure and basic services. The rapidly increasing urban population is increasing the already high unemployment and demand for jobs, which increases the risk of conflict, particularly for the youth and possibilities of radicalization and attraction to crime. Unemployment and decent work deficits are recognized as significant factors leading to conflict, but also as a possible way to create safer societies in the aftermath (ILO, 2019).

The ILO highlights a lack of employment and decent work opportunities as a key factor in leading people to violence in Somalia. Somalia has one of the highest rates of youth unemployment in the world (and youth unemployment is highest in Baidoa) as well as widespread vulnerable forms of employment and working poverty. Vulnerable employment accounts for 40% of total employment and underemployment is estimated to be 25%.

1.5. Potentials and opportunities

Despite the major problems, recent improvements in governance, government interventions and support by development partners, coupled with the resilience of the Somali people gives hope for an improvement in socio-economic conditions. Somalia has made strides in improving security, stabilising the economy, and rebuilding a functioning state since the re-establishment of the central authority (the Transitional Federal Government of Somalia) in 2004. In 2011, Somalia adopted a provisional constitution, and established a federal system of government in 2012. A new parliament was elected in 2017 and in November 2020 Somalia leaders reached an agreement to hold parliamentary and presidential elections through indirect voting (UN, 2020), which, after some postponements, lead to the election of a new president in May 2022.

This second peaceful transition of power provides further opportunities for the new government to exert their authority and scale up services. South-West State were credited for being the first among the federal member states to complete their elections and quota of parliamentary seats. According to the World Bank Somalia's economy has grown modestly in recent years. Between 2013 and 2017, the real annual GDP growth averaged 2.5%, peaking at 4.4% in 2016 but contracting to 2.3% in 2017 due to a severe drought, which caused enormous economic losses in agricultural production (World Bank, 2018). Growth was expected to recover gradually in 2018-2020 to reach 3.1% by 2020. In recent years, economic growth has been driven by a combination of private consumption, financed mainly by remittances from the diaspora, and on the supply side, by growth in services and agriculture.

Baidoa is traditionally one of the most important economic centres in Southern Somalia, conducting significant trade in local and imported cereals, livestock, and non-food items. The

combined effect of drought and the on-going crisis has had a harmful impact on economic stability and livelihoods, leading to a chronic humanitarian situation and major displacements of the population. However, it has potential to grow into a major urban hub if provided with basic infrastructure, and the creation of an enabling environment for further investments in real estate, small scale manufacturing and services.

To mitigate the imminent risk of eviction of IDP families, Baidoa District Administration (BDA), International Organization for Migration (IOM) and partners have identified a large settlement site, called Barwaqo, to the north on the Central Business District (CBD), on a land donated by the government to relocate displaced families. The relocation plan project is intended only to address the most urgent humanitarian needs of sheltr, but also provide the families with longer-term solutions. However, access to livelihoods for IDPs and low economic activity (especially for the youth), is hindering sustainable re-settlement.

BDA, with the support of the SWS Government and development partners has carried out spatial planning of the IDP resettlement site (Barwaqo) with potential for 2,900 households. BDA with support from UN partners in 2019 has also prepared a Community Action Plan (CAP) (BDA, 2019) which identifies infrastructure and roads as a focus area – with the development of Barwaqo being one of several actions. The current state of infrastructure and expansion of settlements highlights the need for proper access through the construction of roads, and pedestrian walkways, with solar streetlighting to enhance security. This in turn will improve the living and working environment, whist supporting integration between IDPs and host communities.

The EIIP approach is that labour-based construction creates short-term jobs and results in improved assets, cash income and multiplier effects through increased local spending. A Local Resource-Based (LRB) approach improves access to basic services, whilst decent work, capacity building and participatory approaches lead to better community ownership, skill retention and maintenance. Over 4 decades the ILO has developed a comprehensive package of interventions, recognising that in fragile contexts employment, decent work and social dialogue makes a key contribution to building peace and resilience.

2. Project presentation

2.1. Intervention strategy

To address the issues of displacement, constrained livelihoods, conflict, and dilapidated infrastructure, outlined in detail in the previous sections, the project was designed to provide interventions in the short-term through employment opportunities for IDPs, returnees and host community members, as immediate humanitarian support, mid-term development of infrastructure and, in the long term, improved capacity of public institutions and private sector actors, along with skills upgrading, will enhance opportunities for employment and access to the labour market, especially for the youth. Infrastructure delivery will support economic development including longer term income earning opportunities, improve urban settlements, and build resilience.

2.2. Rationale and justifification

The 2022 Humanitarian Response Plan produced by OCHA notes that the humanitarian situation in Somalia has become one of the world's most acute crises and that recurring stress factors of conflict, climactic shocks, disease outbreaks and large-scale displacement has deepened poverty levels, as people lack access to sustainable livelihoods. Under the second Strategic Objective the response plan targets 5.5 million people including 1.6 million IDPs and 3.9 million non-IDPs, ensuring safe equitable and dignified access to livelihoods and essential services.

The Humanitarian Development Peace Nexus (HDPN) or 'triple nexus' takes the approach that one set of actions alone cannot solve the problem – and that humanitarian, development and peace actions all have a role to play. The country brief on Somalia notes that decades of instability, conflict, and recurrent climatic shocks have disrupted livelihoods, service delivery, and have devastated physical infrastructure. The proposed project addresses the collective outcome of access to basic services whilst strengthening capacities to increase social cohesion of urban communities.

The multi-sectoral needs assessment of July 2022, addressing the drought crisis of South-West State, recommends cash-for-work to support households, rehabilitation of infrastructure and increase income. The importance of facilitating access to safe and age-appropriate livelihoods for at-risk women and girls, which will help prevent them engaging in risky coping strategies, is also emphasised.

2.3. Objectives, outcomes and components

The project was designed with two complementary components- infrastructure improvement and creation of employment opportunities through the use of the EIIPs employment intensive investment approach, plus capacity building of the public sector institutions and private sector actors. The development objective or impact of the project is increased socio-economic development of selected IDPs, returnees and their host communities in Baidoa District. The expected outcome is improved and sustainable access to basic, economic, and social services, transport, and employment opportunities. The project objectives, indicators and outcomes are summarized in Table 1, and the impact chain illustrated in Figure 2.

Table 1: Objectives, indicators and outcomes

Objective	Indicator	Measure
Development Objective Increased socio-economic development of selected IDPs, returnees and their host communities in Baidoa district	**Development indicator 1:** Increase in household income (%)	% of HH earning less than $ 50 per month
	Development Indicator 2: Proportion of residents in the target communities who perceive relations within their community to have improved.	% of Population segment who perceive relationships as positive
	Development Indicator 3: IDPs women reporting to have improved their situation as a result of increased access to income generating activities through the project	%
Outcomes Improved and sustainable access to basic, economic and social services, transport, and employment opportunities	**Outcome Indicator No. 1:** No. of men & women in target communities with access to improved (all-weather) road and pedestrian infrastructure within 500 m radius	
	Outcome Indicator 2: New businesses along improved roads/transport/economic corridors	
	Outcome Indicator 3: Number of new businesses in improved markets	
Output 1 Improved productive infrastructure in and to IDP and returnee settlements and their host communities	The number and types of project measures identified for implementation	
	% of projects built to quality standards and completed on time	
	Km of roads rehabilitated to quality standards	
	Km of pedestrian walkways constructed to quality standards	
Output 2 Immediate opportunities for employment created for IDPs, returnees and their host communities	Number of jobs created with a duration of at least 40 days	

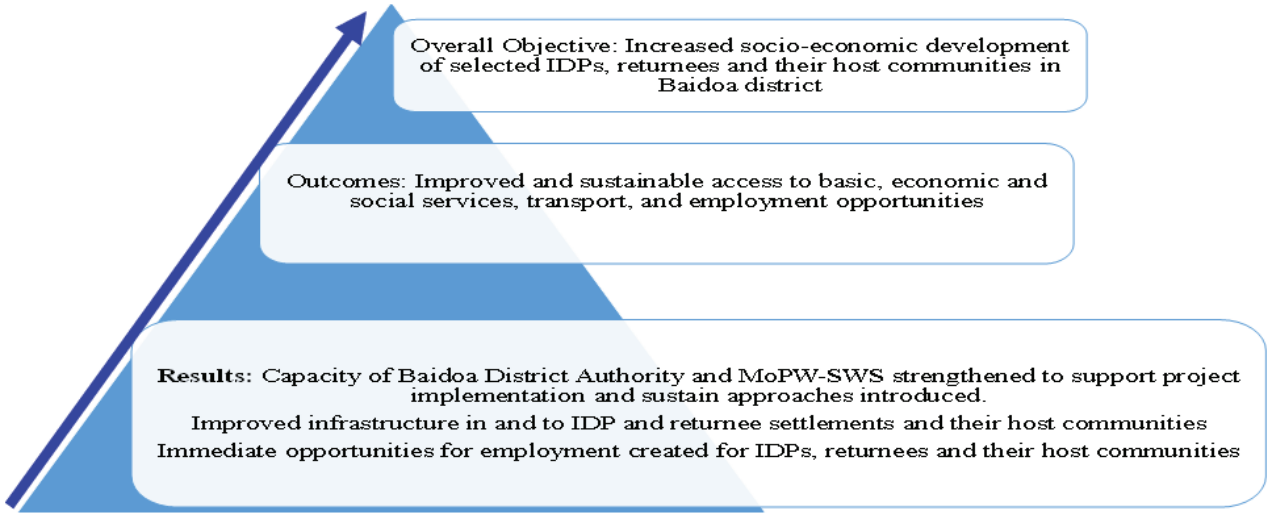

Figure 2: Project results and impact chain

2.4. Target groups

The project design directly targets vulnerable youth, women and men living in the IDP and returnee settlements, the host communities and staff from the public institutions- BDA, MoPW, MoLSA, as well as small-scale contractors. The identification and selection of these target groups is informed by vulnerability- in the case of youth and women, and by the capacity needs for future infrastructure planning and execution in the case of public sector institutions and private sector actors. The project also benefits users of the infrastructure, directly or indirectly depending on proximity and access. The project will also indirectly benefit the business community through the wages earned and injected into the local community, thereby stimulating demand of goods and services.

The targeting of youth as beneficiaries is informed by vulnerability, as 43% (WB, 2015) of the population live on less than 1 USD per day. About two-thirds of people between 16 -29 years are believed to be unemployed. The youth are disproportionately affected by poverty and unemployment and are prey to recruitment into militia or radicalized groups. By targeting youth, the project offers alternatives to economic and social attraction associated with radicalization and crime.

The targeting of women is informed by the key role they play in home-making, but which have otherwise been traditionally side-lined from decision making and business activities in the wider Somalia context. About 90% of women never attend school and young girls are the worst affected. The project promotes participatory and inclusive engagement of vulnerable groups (women, youths, female-headed households of host communities and IDPs), already at the planning stage, by dis-aggregating analysis by gender and input from specific gender groups. Road infrastructure projects by nature tend to be socially constructed as male-oriented. Extra efforts will have to be made to identify and ring-fence specific activities for women.

The capacity of public institutions in infrastructure planning in general is very low, and knowledge of Employment Intensive Infrastructure (EII) and local resource-based approaches (LRBA) are practically absent. Awareness, sensitization and skilling in in EII and LRBA, and in project management will capacitate the institutions for the future projects.

The bulk of the delivery is executed through small scale contractors, suppliers and artisans. The Project enhances their capacities through training, to adopt cost-effective employment intensive techniques as well as in financial management, record keeping, workers management, work-distribution methods, payment methods, and reporting of progress. The awareness and training of contractors increases opportunities for employment. The skills gained and enhanced capacities will open up opportunities to private sector actors to contribute to employment in privately funded infrastructure investments.

2.5. Environmental and social safeguards

The process of setting up of an Environmental and Social Safeguards Framework (ESSF) comprised of an initial assessment, a Baseline Study and conflict sensitivity assessment at project inception. At the project detailed design stage, an Environment and Social Management Plan was elaborated, which included a Grievance Redress Mechanism and a checklist for monitoring compliance at implementation stage. The standards and procedures were included in the Terms of Reference (ToR) for project supervision and in the specifications in the tender documents for construction services.

During implementation, the ESSF framework monitoring has been initiated through Environment and Social Management Plans (ESMP) by the contractors, and a Grievance Procedure prepared by the technical supervision consultant. A regular compliance process has been put in place, and comprises of a grievance redress mechanism, which has been prepared and disseminated to the Community Umbrella System (CUS), leadership and workers, a checklist for assessment of environmental and social impacts, and mitigation measures and, a code of practice binding contractors/service providers to comply with appropriate labour conditions and practices with specific compliance requirements for notification/announcement of labour vacancies for each contract, recruitment criteria and process, and payment of agreed wage.

The initial monitoring report indicates that contractors have complied with the appropriate labour conditions and practices.

2.6. Conflict sensitivity and grievance mechanism

The project approach includes conflict sensitivity and mitigation of risks associated with competition over resources. A Conflict Sensitivity approach recognises that any development or humanitarian intervention in conflict-affected situations may have unintended negative impacts. As the project is providing resources (economic opportunities, construction contracts, and infrastructure) in a highly complex and fragile context, it was considered crucial for the work to be implemented using a conflict sensitive approach. In the initial stage, the project conducted a baseline study which included conflict sensitivity assessment. The methodology used was based on the ILO handbook on "How to Design, Monitor and Evaluate Peacebuilding Results in Jobs for Peace and Resilience Programmes". And comprised of a desk-based conflict analysis of Baidoa, a three day conflict sensitivity workshop with stakeholders and a baseline study of the projects contribution to sustainable return and reintegration.

A comprehensive report included findings and recommendations on closer liaison with government and community leadership to obtain clearer understanding of issues/conflict dynamics and minimize risks – including perceived or real "gate-keeping", dissemination of information, analysis of conflict risk factors (especially "clannism" and potential elite capture) and consultation with the CUS on fair recruitment of workers and Management of the Grievance Redress Mechanism.

2.7. Theory of change: from intervention to results

The long-term programme objective and the change that the project will contribute to is the increased socio-economic development of selected IDPs, returnees and their host communities in Baidoa district, through infrastructure development and direct employment creation, which in turn will provide improved and sustainable access to basic, economic, and social services, transport, and employment opportunities. The detailed visual diagram of the change pathways, in figure 3 below, shows the links between the core problems, the project does (outputs), what changes and influences it will achieve (outcomes) as well as its contribution to the long-term change (impact or development objective).

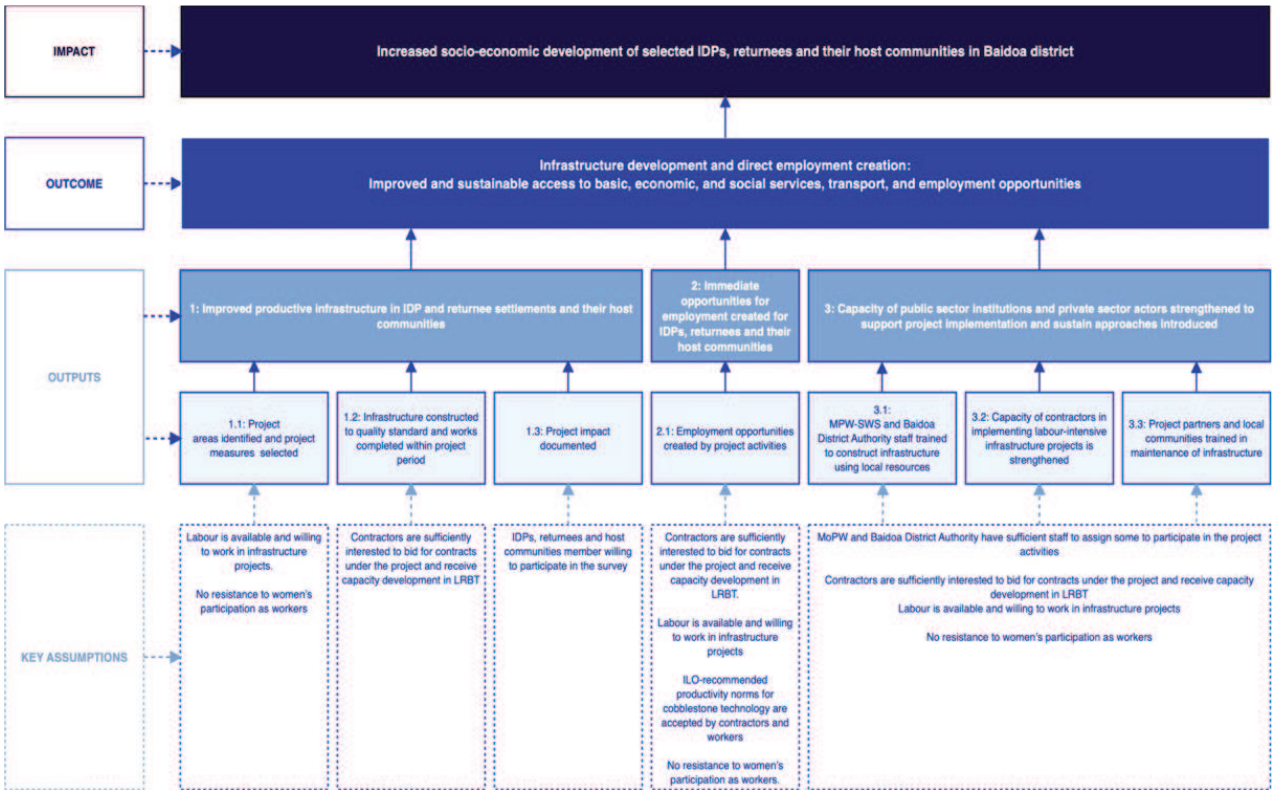

Figure 3: Theory of change visualisation

2.8. Monitoring, evaluation and reporting

The programme is monitored and evaluated on the basis of the outcomes and outputs in the results matrix. Primary data such as employment created, wages is collected for at the activity level and verified through spot checks, secondary data is collected through surveys, interviews, group discussions and other means. Impact level data will be collected through household surveys and key informant interviews. The project is also monitored through a donor-appointed Third Monitoring Party (TPM) process.

3. Progress and initial results

3.1. Contribution to African Decent Work Agenda

The project is making a contribution to the youth unemployment problem in Baidoa, and by extension to Somalia and the African region. This is a direct response to the Adidjan Declaration, thus responding to the Abidjan Declaration on shaping an African Decent Work Agenda. The implementation strategy aligns to the ILO Recommendation on Employment and Decent Work for Peace and Resilience (No. 205) (ILO 2017), and mandate in the humanitarian-development-peace nexus, to contribute to more peaceful and resilient societies through the promotion of employment and decent work, aiming to prevent and respond to the devastating effects of conflicts and disasters. The proposed project provides immediate decent and environmentally friendly job opportunities based on just transition measures, while the while constructed infrastructure will contribute towards sustainable economic development and resilience.

3.2. Project measures

The main project measures comprise upgrading of urban link roads, pedestrian walkways, associated civil works and drainage, and installation of solar streetlighting. The roads will be paved with locally mined cobblestone to optimize local resource use in the construction and long-term skilling of local artisans in extraction, shaping and paving, which.

The planned outputs are:

- Improved access to IDP settlements: About 20km of roads with solar lights, rehabilitation and improvement of 1 markets, and the basic routine maintenance of completed infrastructure
- Decent employment opportunities created (at least 217,000 worker-days of employment created (of whom 30 % for women and 60% for youth)
- 30 % of infrastructure work budgets (USD 1.77million) directly injected into reviving the local economies through payment of wages and purchase of local materials.
- Technical capacity of the key institutions in the infrastructure sector at local level and private sector developed/strengthened.

Table 2 below summarises the proposed scope and estimated costs for the project measures. Some of the identified and designed roads could not be prioritized in the current budget and will be considered for a potential phase 2.

Table 2: Project measures

No.	Project measure	Description	Unit	Quantity	Cost estimate (Million US$)
1.1	Total identified and designed road sections	18 road sections	km	18.81	8.04
1.2	Road sections prioritized under on-going project Phase 1 budget	13 road sections	km	12.13	4.80
1.3	Balance of road sections designed but not prioritized under budget (to be considered in a potential Phase 2)	5 road sections	km	6.68	3.24

3.3. Procurement of works

Two (2) rounds of pre-qualification of local contractors have been conducted and a total of fifteen (15) contractors prequalified, of whom seven (7) have under -gone pre-tender-cum- EII approaches training. Two (2) rounds of tender have been launched with a total of five (5) LOTS of road projects. A total of five (5) LOTs of works have been awarded, of which 2 lots are 50% completed, and three (3) lots have recently commenced.

3.4. Performance indicators

The execution of works is in the early stages. But the initial process development activities and outputs provide grounds for optimism on the viability of the approach. The expansion of the CUS from 9 members to 13, and gender representation from 1 out of 9 to 5 out of 13 has increased the voice of women in the labour selection process. The establishment of employment quotas for different target groups (IDPS, returnees, host community) has suspicion of potential marginalization especially of IDPS and returnees by the host community. The setting of a quota for women participation has motivated women to turn up during recruitment, to the extent that at initial recruitment the quota of 30 per cent was achieved. However this initial result has been dampened by a large number of layoffs of women by contractors, ostensibly due to their (women) unwillingness to carry out the set task rates. The set up of a grievance redress mechanism has provided a clear avenue for raising grievances especially perceived or really threats of eviction.

The identification of cobblestone, which is in abundance in Baidoa, as the default material of choice for road paving and lining of stormwater drains has dramatically raised the threshold of local content to at least 30 % and created opportunities for decent wage.

The execution of construction works is only at approximately 13% of target (overall estimated 1.6 km out of 12.13 km). The estimated value of works executed to-date is approximately US$ 450,000.00 out of a target value of US $ 5.4 million. Even at this low execution, the income earned from labour is a significant injection of capital into the local economy.

Table 3: Performance indicators

Performance Indicator	Measure	Output/Qty		Performance/achievement rating (% 0f target)
		Target	Actual To date	
Est. Qty of Inf.	km	12.13	1.6	13.19%
Est. Value of work	US$	540,0000.00	450,000.00	8.33%
Labour- Work days of Employment	WD	217,000	15,475	7.1%
Labour-Wages	US$	1,770,000	169, 900	9.60%

Table 4: Participation and equity indicators

Performance Indicator	Measure	Output/Qty		Performance/achievement rating (% 0f target)
		Target	Actual To date	
Returnees	%	30	11.9	39.67%
IDPs	%	40	41.7	104.25%
Host	%	30	46.4	154.67%
Male	%	70	86.6	123.71%
Female	%	60	13.4	22.33%
Youth	%	60	59.7	99.50%
Non-Youth	%	40	40.3	100.75%

4. Lessons learnt, Recommendations and Mitigation Measures

The major challenges are high risk environment, potential conflicts between and among the stakeholders, low capacities of public institutions and private sector entities, reduction of project scope due to increased costs, challenges in procurement due to COVID 19 Pandemic and low participation of women. These challenges have required adjustments in the initial project implementation arrangements and innovations in procurement. The project supervision arrangements were changed from direct supervision by ILO engineers to supervision by private consultants with ILO oversight. To mitigate risk of potential conflicts between and among the different target groups, an extensive sensitization campaign was conducted for decision makers and community leaders and followed up by workshops on labour recruitment through the Community Umbrella system. Furthermore, a Grievance Redress Mechanism was set up with a confidential reporting system and a Grievance Register.

The challenge of procurement was resolved by implementing an e-tendering system, which included a pre-tender-cum- EIIP Training for all participation contractors.

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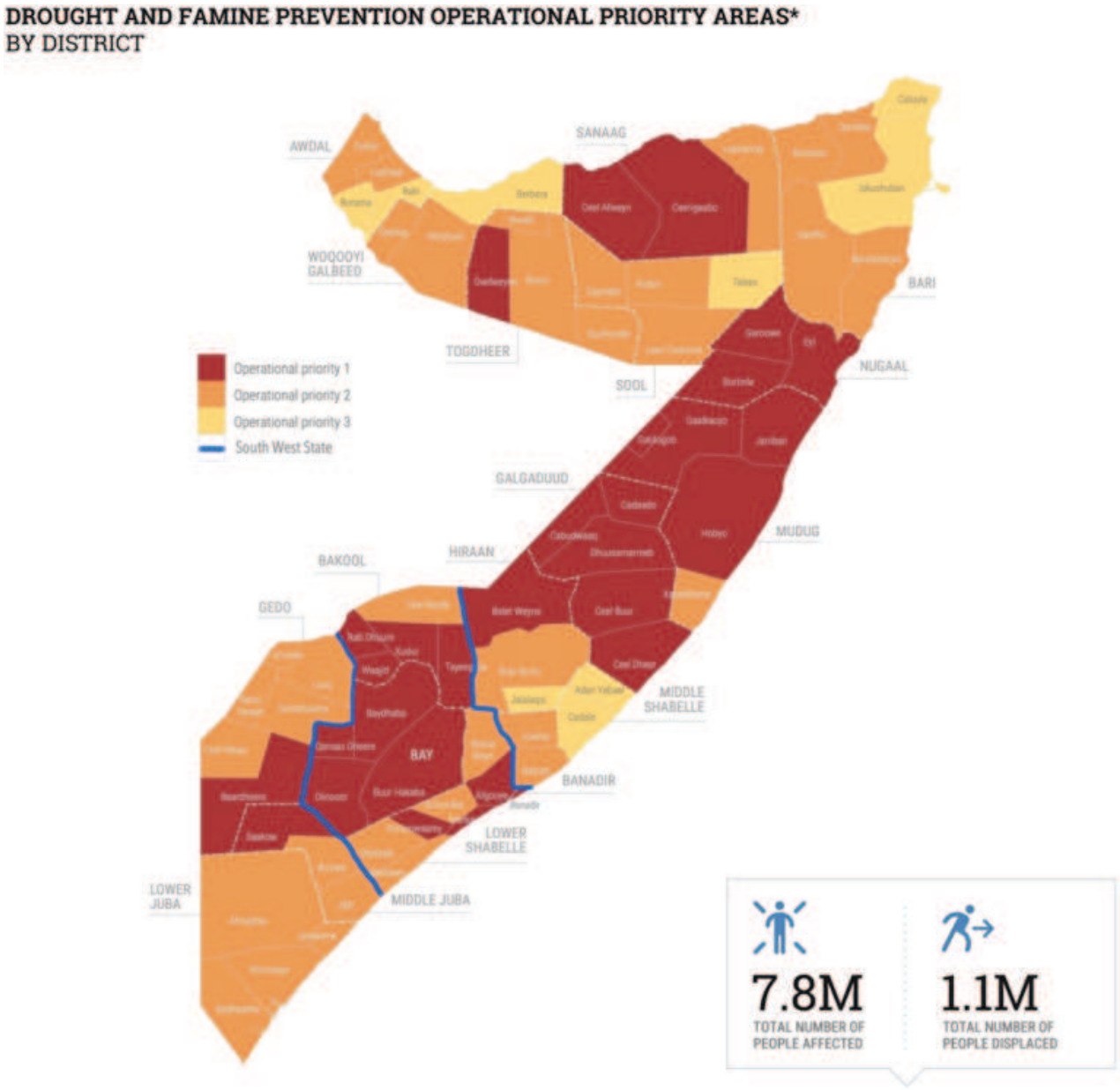
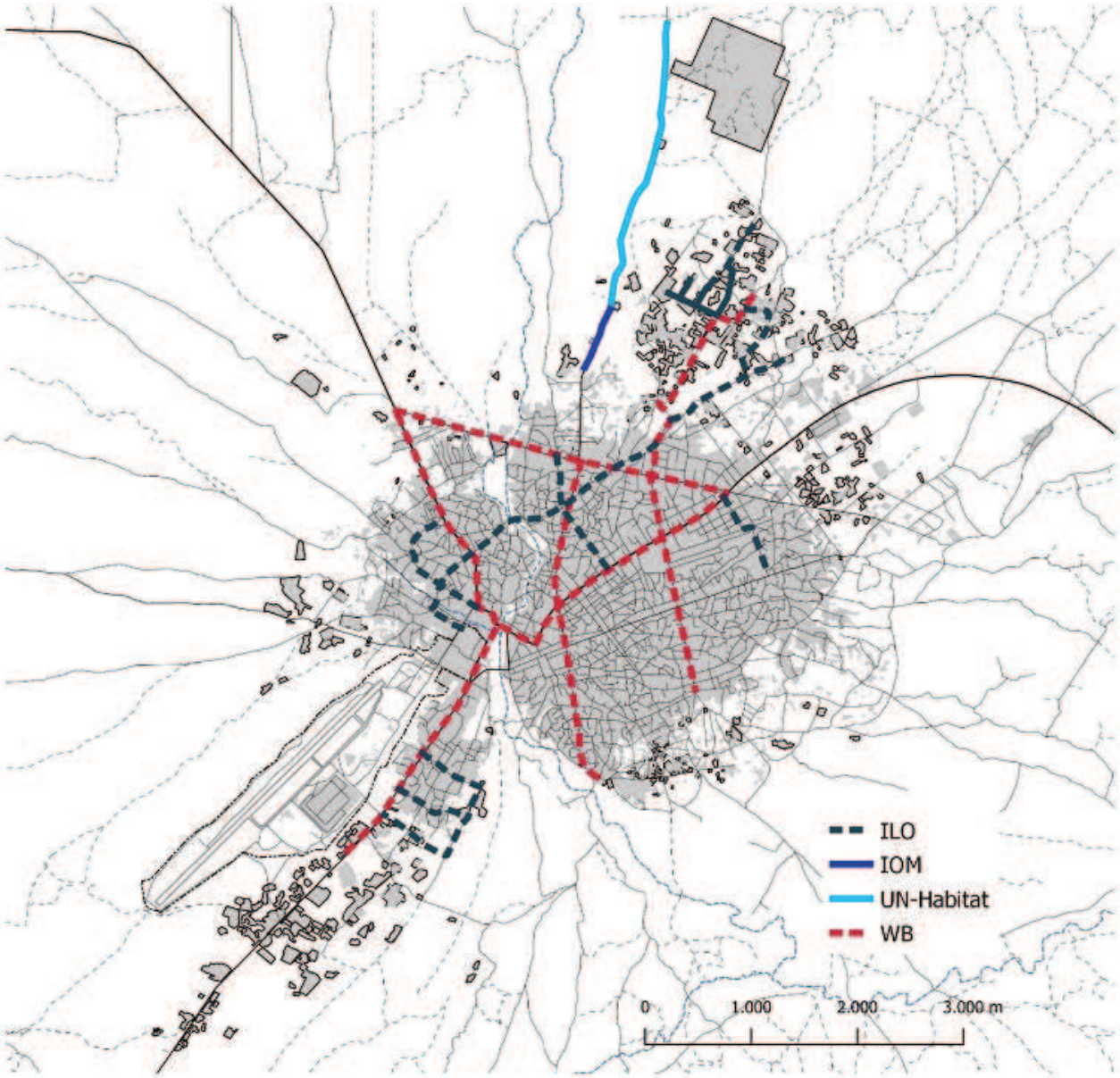
Appendix - Maps and Photos

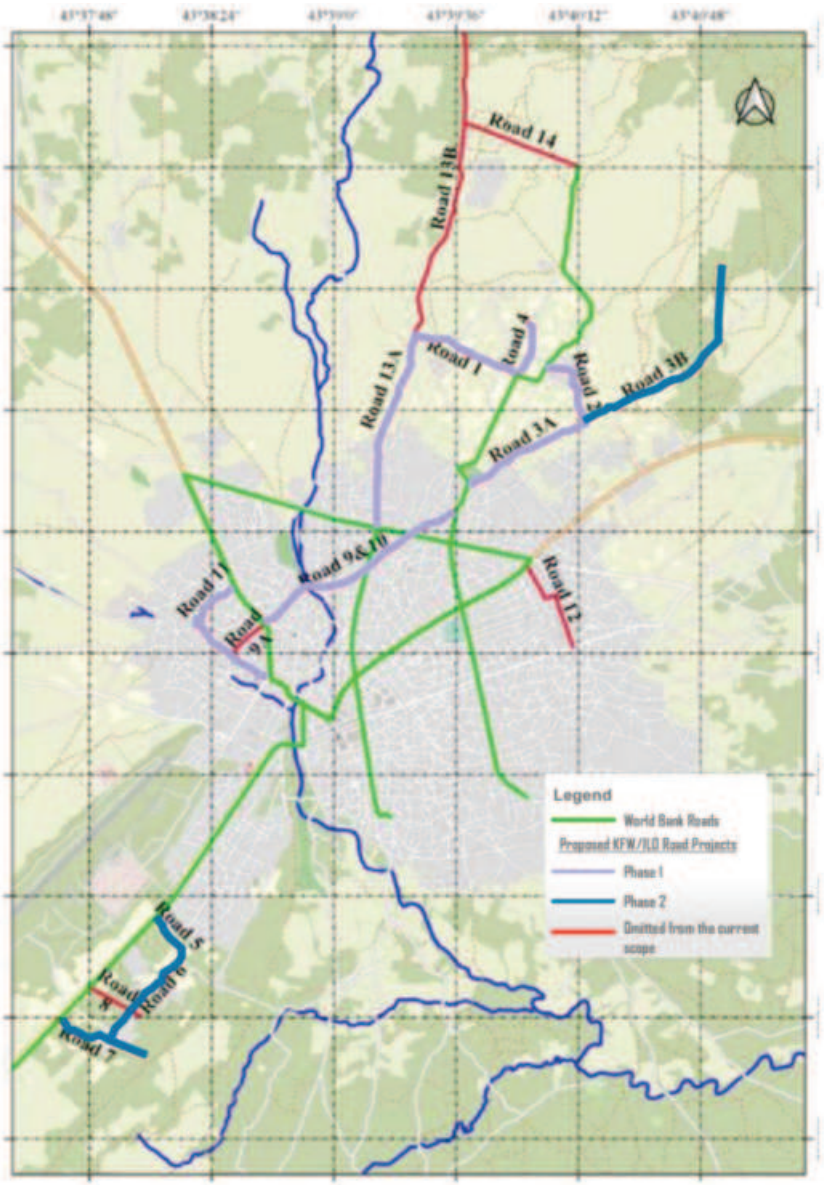


Map 1: UNOCHA Drought and Famine Prevention Operational Priority Areas - October 2022



Map 2: Infrastructure projects planned in Baidoa

Source: Baidoa urban profile 2020- UN/Habitat/MoPW



Map 3: Status of Phase 1 roads

Source: ILO Project Team compilation

Photo 1: Commencement and preparatory works

Photo 2: Construction works - side drainage and pedestrian walkways

Photo 3: Construction works

Photo 4: Construction works - cobblestone paving

Photo 5: Construction works - cross drainage