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A Critique of the EPWP Infrastructure Sector – Part 2

This is the second article in a three-part series focusing on the context and framework of modern labour-intensive construction in South African public works programmes, bearing the Infrastructure Sector of the Expanded Public Works Programme (EPWP) 2004/05 to 2013/14 in mind.

PUBLIC WORKS PROGRAMMES AND LABOUR-INTENSIVE CONSTRUCTION IN SOUTH AFRICA

In the previous article (Part 1), which appeared in the May 2018 edition of *Civil Engineering* (pp 53–62), we provided an essential background to the principal factors related to the technical component of labour-intensive construction in South Africa. We now turn to considerations related to policy and legislation.

In the first place, public works programmes are now a formal part of government strategies to combat unemployment, poverty and inequality. In November 2011 the National Planning Commission published its National Development Plan. In Chapter 3 (*Economy and Employment*) the following is stated:

Promoting employment in labour absorbing industries ... Public employment programmes are an essential element of any employment strategy, taking on board lessons from successes and failures in our existing programmes. Up to 1 million opportunities will be created annually by 2015, mostly through community-based services. As market-based employment expands, so these opportunities can be reduced. However, they will be needed in large numbers over the entire period. (2011: p 93)

Prior to 2011 this approach towards Public Works Programmes was not always so clear; neither was the best means for implementation.

The Framework Agreement and the National Public Works Programme¹

Framework Agreement

Between 1991 and June 1993 a Framework Agreement was negotiated between COSATU (Congress of South African Trade Unions) and the Construction Industry.²

Why is it necessary to consider the Framework Agreement?³ In the first place: as a result of the negotiations, a central concept of the Framework Agreement – the use of labour-intensive methods – was accepted by COSATU, and also by SANCO (South African National Civic Organisation), under specific conditions. There was tension about what the ILO (International Labour Organisation) terms as ‘output-based remuneration’, a special case of which is ‘no work no pay’. In turn this led to serious questions about the whole nature of appropriate contractual documentation. Details were clarified during extensive discussions between James Crosswell and Lisa Seftel.

Secondly, many essential elements of the current EPWP Guidelines (2015) were formulated originally for the Framework Agreement.⁴ The specifications and contract detail contained in the Framework Agreement came directly from the work carried out by James Crosswell in the Eastern Cape.

The Framework Agreement between COSATU and the construction industry expired on 30 June 1994. Considerable efforts were made to renew the agreement, but this time with the inclusion of government. Despite much lobbying it proved impossible to renew the agreement. The last revision was dated August 1996.

National Public Works Programme

Early in 1994 the National Economic Forum (NEF) carried out a thorough investigation of a *National Employment Creation Programme for the Provision of Public Infrastructure using Labour Intensive Methods*, which was abbreviated to a *National Public Works Programme* (NPWP).⁵ Several focus group committees were established and reported back to the NEF. The author and Dr Sean Phillips were responsible for the Technical Focus Group.⁶

The new government located responsibility for its NPWP within the national Department of Public Works. Hon J Radebe was Minister of Public Works. Unfortunately it was not realised

at the time that the Department of Public Works (DPW) was primarily responsible for Public Buildings. The DPW had very little experience or leeway related to public works (infrastructure). Public Works were the responsibility of ministries such as Water Affairs and Transport and various provincial departments.

Despite being in the 'wrong' ministry the NPWP established linkages with the civil engineering industry. A Research Advisory Group was established. A large contractor group agreed to consider the use of labour-intensive methods on projects over R100 million. The SA Association of Consulting Engineers (as it was known at the time, now CESA) prepared a set of model forms to be used for the appointment of consulting engineers. The committee was chaired by James Crosswell.

The NPWP was partly based on lessons derived from large-scale, long-term experience elsewhere in sub-Saharan Africa.

However, during implementation, the NPWP did not follow most of the essential elements of this model. In particular:

- Long-term plans were not drawn up for the construction of specific roads or other infrastructure.
- A formal training system was not established. Very little technical training was carried out. A system for technical training was not established. During negotiations with COSATU there had been a stated commitment to training. This did not take place in relation to technical skills; where it occurred it was mainly 'life skills' ... The lack of the type of systematic technical and organisational training used in Kenya, Lesotho and Botswana bedeviled the NPWP.
- Given the fact that there were no long-term construction plans and no training system, the consequence was that there was no formally integrated training and construction programme. Thus: the NPWP was a *Programme in name only*. It was an *ad hoc* collection of separate projects.

The NPWP also differed from the model as follows: no *in-house* capacity was set in place.

In addition to all these differences probably the most important was the decision that *delivery* had to be through the use of *small contractors* (and therefore the *contract*), instead of through *instruction*.

Legislation

A major stumbling block for implementation of the NPWP was the collapse of the Framework Agreement. The difficulties experienced eventually led to amendments to labour legislation regarding Special Public Works Programmes.⁷ Without this legislation the EPWP would not be able to operate.

Two pieces of legislation provided the foundation for the introduction of the EPWP: the *Amendments to the Basic Conditions of Employment Act 2002*, and the *Division of Revenue Act 2004*.

Amendments to the Basic Conditions of Employment Act

On 25 January 2002 the *Government Gazette* (No 23045) of South Africa published the following:

- Number R63 Basic Conditions of Employment Act, 1997
- Ministerial Determination: Special Public Works Programmes
- Number R64 Basic Conditions of Employment Act, 1997
- Code of Good Practice for Employment and Conditions of Work for Special Public Works Programmes.

Amendments have been republished since then, the most recent being issued in May 2012.⁸ Full original details may be found in

the *Government Gazette* (RSA 2002). Here we wish to highlight a few of the principal features.

In the Ministerial Determination (R63), *inter alia*, it was stated:

- *Special public works programme* means a Programme to provide public assets through a short-term, non-permanent, labour-intensive programme initiated by government and funded from public resources.
- The word *task* means a fixed quantity of work.
- The term *task-based work* means work in which a worker is paid a fixed rate for performing a task.
- Workers on an SPWP are employed on temporary basis.
- A worker may NOT be employed for longer than 24 months in any five-year cycle on an SPWP.⁹
- Employment on an SPWP does not qualify as employment as a contributor for the purposes of the Unemployment Insurance Act 30 of 1966.
- A task-rated worker will only be paid for tasks that have been completed.
- An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer.

The schedule "Code of Good Practice" (R64) included, *inter alia*:

- Reducing unemployment is one of the greatest challenges facing South Africa. Government has undertaken a number of initiatives to address unemployment and poverty, including the promotion of labour-intensive Special Public Works Programmes (SPWPs). An SPWP is a short-term, non-permanent, labour-intensive programme initiated by government and funded either fully or partially¹⁰ from public resources to create a public asset.
- On the task-based system, a worker is only paid for each task completed.
- A 'no work no pay' rule must apply except in the following circumstances: illness, injury.
- Training is regarded as a critical component of SPWP. Every SPWP must have a clear training programme that strives to:
 - ensure that programme managers are aware of their training responsibilities
 - ensure a minimum of two days training for every 22 days worked¹¹
 - ensure that a minimum of the equivalent of 2% of the project budget is allocated to funding the training programme.

The training components were the *quid pro quo* demanded by COSATU to allow (1) payment to be made on a task basis, (2) 'no work no pay' and (3) relaxation regarding the definition of 'temporary' from three months to 24 months.

Division of Revenue Act and the EPWP Guidelines

Another crucial piece of legislation was enacted in 2004: the Division of Revenue Act (DORA). This Act made it *mandatory* to use labour-intensive methods for specific categories of infrastructure that are funded through the formal channels for public infrastructure: the Provincial Infrastructure Grant (PIG) and the Municipal Infrastructure Grant (MIG). It is important to stress that the funding allocated for the infrastructure component of the Expanded Public Works Programme formed part of normal

government expenditure, and therefore had to follow normal procedures as specified by National Treasury under the Division of Revenue Act. These procedures included an annual audit. Thus, the funding was not an 'add-on' for emergency / poverty / drought relief. This marked a significant difference between the infrastructure component of the Expanded Public Works Programme and all previous programmes of this nature in South Africa. Thus, modern labour-intensive construction had been brought into the normal budgetary procedures and, at face value, was thus part of the major economy. The conditions stipulated in DORA have been updated annually.¹²

The specific categories for which it was *mandatory* for public bodies to use labour-intensive methods were:

- low-volume roads
- stormwater drainage
- sidewalks
- trenches.

Public bodies were *required* to implement these categories using the *Guidelines for the Implementation of Labour-intensive Infrastructure Projects under the Expanded Public Works Programme* (DPW 2004), which were specifically produced for the EPWP.¹³ The four categories can be built using *highly* labour-intensive methods. There is no valid excuse for not complying with legislation and regulation. The increase in productive site expenditure to 30% and the concomitant increase in labour-intensity are relatively easy to achieve using proper labour-intensive methods.

With regard to a constructive critique of the EPWP it is essential to bear in mind the extensive technical research and field experience carried out by the World Bank and the ILO in the 1970s and 1980s, and in South Africa during the 1990s and early 2000s, which showed that modern labour-intensive methods are valid for 'high standard' infrastructure.

It is far less technically challenging regarding the relatively simple categories for which it was supposedly mandatory.

We now turn to detailed consideration of the first ten years of South Africa's Expanded Public Works Programme.

EXPANDED PUBLIC WORKS PROGRAMME (EPWP): 2004/05 TO 2018/19

Introduction

In 2004 the South African government initiated the Expanded Public Works Programme. It was one of its strategic responses to the triple challenge of poverty, unemployment and inequality. Employment would be generated and poverty alleviated during the provision of public goods and services.

The greater use of labour-intensive methods was at the intellectual core of the Programme.¹⁴

The EPWP began in April 2004, and the third five-year phase in April 2014.

Between 2004/05 and 2013/15, R128.5 billion (over \$10.5 billion)¹⁵ were spent on the Infrastructure Sector of this EPWP. As we have seen in Figure 1 (see first article in May 2018 edition of *Civil Engineering*), this amounted to nearly 80% of the total expenditure on the EPWP. Expenditure on the Infrastructure Sector was derived from funding formally allocated for public infrastructure. These were not social welfare allocations. However, unlike much other expenditure on public building and

"The Expanded Public Works programme remains an effective part of government's response to the triple challenge of poverty, unemployment and inequality."

infrastructure, the EPWP has very clearly defined socio-economic objectives (in addition to the physical product).

As discussed above, the proper use of modern labour-intensive methods results in 30–65% of construction site expenditure accruing to labour,¹⁶ compared to the 10% maximum¹⁷ achieved using conventional capital-intensive methods.

The extent to which the Infrastructure Sector of the EPWP has failed to meet its own targets may be judged by the following: **labour-intensity has remained stubbornly around 10%**, which is barely more than could be achieved using conventional equipment-intensive methods.

In the next section of this article the results of the first two phases of the Infrastructure Sector of the EPWP will be summarised. The article will then outline the lessons that have been learnt during the South African experience. These lessons will be useful for future implementation in both South Africa and elsewhere in Africa.

While the analysis concentrated on labour-intensity in the Infrastructure Sector, it also revealed that there is an enormous shortfall between the allocation recorded in the *EPWP Quarterly Reports* and expenditure. The serious inability of the public sector authorities to spend the funds allocated to them impacts negatively upon employment and wages. The inability to spend allocated public funds has important implications beyond the question of labour-intensity: the need to improve the 'in-house' capacity of the public sector.

We now turn to consideration of the EPWP in some detail. As mentioned earlier, the EPWP began in April 2004, and the third five-year phase in April 2014.

Stated objectives of Phase Three

- To provide work opportunities and income support to poor and unemployed people through the delivery of labour intensive public and community assets and services, thereby contributing to development.¹⁸

The importance of the Programme may be judged by its inclusion as one of the Public Employment Programmes mentioned in the National Development Plan. Its continued strategic importance may be judged by a Minister of Public Works reiterating that: "The Expanded Public Works programme remains an effective part of government's response to the triple challenge of poverty, unemployment and inequality."¹⁹

Major objectives of Phase Three

- Work opportunities: 5 951 124
- Infrastructure: 2 386 000
- Full-time equivalents (FTEs)²⁰: 2 422 707
- Infrastructure: 778 235.

The threat to achievement of the projections is particularly the case for the infrastructure sector, for which employment projections have been based on a labour intensity of about 26%, whereas the average achieved during the first two phases was only 10%.

As will be shown below, implementation during the first TEN years did not result in anywhere near the amount of employment

Table 1 EPWP 2004/05 to 2013/14 allocation, expenditure, full-time equivalents and wages – total and Infrastructure Sector

EPWP 2004/04 to 2013/14 Total and Infrastructure Sector allocation, expenditure, full-time equivalents and wages			
	Phase One 2004/05 to 2008/09	Phase Two 2009/10 to 2013/14	Total 2004/05 to 2013/14
Total allocation (billion)	99	657	756
Total expenditure (billion)	50	113	163
Percentage expenditure/allocation	50	17	22
Infrastructure allocation (billion)	71	472	543
Infrastructure expenditure (billion)	42	87	129
Percentage expenditure/allocation	60	18	24
Percentage infrastructure expenditure/total expenditure	84	77	79
Total FTEs	550 918	1 147 699	1 698 617
Total wages (million)	6 726	18 000	24 726
Infrastructure FTEs	312 227	469 206	781 433
Infrastructure wages (million)	4 507	8 500	13 007

that should have been achieved if proper labour-intensive methods had been used. Various reasons will be provided for the inability to achieve the potential. But first we will summarise the results from the EPWP data.

It has been pointed out that this data is unreliable and that double-counting exists.²¹ That may be the case, but this is the data officially recorded in the *EPWP Quarterly Reports* on the website www.epwp.dpw.gov.za.

Summarised results of the first two phases

The scale of expenditure suggests that the EPWP is a mega project, albeit disguised by being spread over more than ten thousand smaller projects. It should be treated with the intensity to detail required for successful implementation of a mega project.

As stated earlier this article focuses on results in the Infrastructure Sector for three main reasons: it is the main sector

in which it was originally planned that a significant increase in productive employment would be generated per unit of expenditure; it is the component of the Programme which does *not require additional state expenditure* because the funding is *already earmarked/allocated* for expenditure on infrastructure; and it has been the largest sector as far as both allocation and expenditure are concerned.

Total employment created in the Infrastructure Sector, as measured in FTEs, amounted to 781 433; wages amounted to R13 007 million.

Table 1 contains further data regarding allocation, expenditure, employment and wages for the whole EPWP and for the Infrastructure Sector itself.

Allocations²²

During a ten-year period the whole of the EPWP was allocated R756 billion. Only R163 billion was spent. As we saw in Figure 2

Table 2 Infrastructure Sector – actual employment as measured in FTEs and opportunities foregone

EPWP 2004/05 to 2013/14 Infrastructure Sector allocation, expenditure, actual full-time equivalents/wages and potentials			
	Totals 2004/05 to 2013/14	Potential employment at existing low level of labour-intensity	Potential employment allocation spent at 30% labour-intensity
Infrastructure allocation (billion)	543		543
Infrastructure expenditure (billion)	129	129	
% expenditure/allocation	23.7		
Actual labour-intensity	10.1		
Potential labour-intensity		30	30
Actual infrastructure wages (million)	13 007		
Potential infrastructure wages (million)		38 634	164 273
Actual infrastructure FTEs	781 433		
Potential infrastructure FTEs		2 321 888	9 807 944

(see first article in the May 2018 edition of *Civil Engineering*), the proportion of expenditure to allocation decreased over time.

The Infrastructure Sector was allocated R542.8 billion, but only R128.5 billion was actually spent (23.7%).

A major difference between the South African economy and most of the countries in sub-Saharan Africa is that the allocation and expenditure was generated internally without reliance upon donor funding.

However, the discrepancy between the amount allocated and the actual expenditure shows a severe lack of capacity to deliver at national, provincial and local levels.²³ The implications will be dealt with below. Before doing so it is instructive to look at disaggregated data from Phases One and Two.

Disaggregated Phases One and Two

- Phase One: infrastructure expenditure of R41.8 billion amounted to 59.1% of the R70.7 billion allocation.
- Phase Two: infrastructure expenditure of R86.7 billion amounted to 18.4% of the R472 billion infrastructure allocation. This leaves much to be desired, and is also a serious decrease from the proportion in Phase One.

The huge difference between allocation and expenditure in infrastructure is one of the main reasons why considerable efforts are being made to classify a great deal more infrastructure as being not suitable for labour-intensive methods, instead of insisting that labour-intensive methods should be used properly. It is the major reason why there has been a move away from the potential towards a social welfare orientation of the whole EPWP, instead of insisting that engineers re-engineer the product and process. Various consultants (departmental advisors without high-standard knowledge and experience) have tried to downgrade the potential and reduce its provenance to rural roads.

Employment created (FTEs): 781 433
 Wages: R13 007 million
 Infrastructure assets created: to be dealt with separately below

Labour-intensity

Labour-intensity was 10.1%. Labour-intensity actually *fell* from 10.8% during Phase One to 9.8% during Phase Two. These percentages are far below both the minimum of 30% that should have been achieved and the 26% mooted for Phase Three.

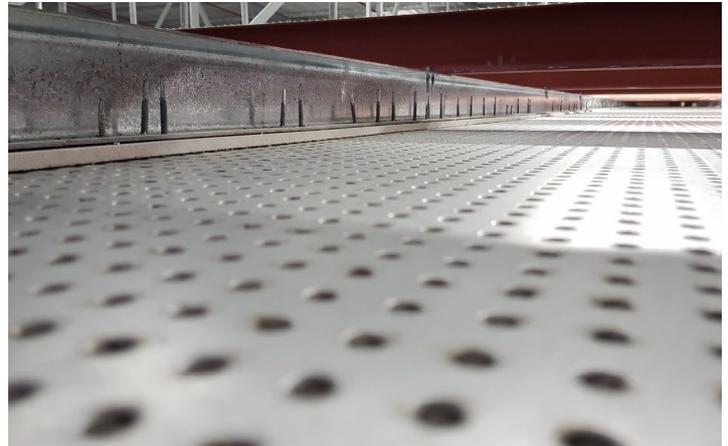
In a nutshell, the labour-intensity in the infrastructure sectors reflects 'business as usual' through the use of conventional construction (capital-intensive / heavy-equipment-intensive) construction. The above numbers were achieved at the low levels of labour-intensity. Use of proper labour-intensive methods would have ratcheted numbers up significantly. The actual results amount to 'opportunities foregone'.

Opportunities foregone – ten years and disaggregated by phase

A summary of opportunities foregone may be found in Table 2.

- **Phase One:** At the labour-intensity of 10.8%, FTEs amounted to 312 227 and wages to R4 507 million. To repeat: for the categories of infrastructure, which form the focus of the EPWP, labour-intensity should be *at least 30%*.²⁴ Therefore, for the actual expenditure, FTEs and wages should have been of the

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order of 867 297 and R12 519 million. If all the allocated expenditure had indeed been spent, we would be looking at 1 467 508 FTEs ($867\,297/0.591 = 1\,467\,508$) and wages of R21 182 million ($R12\,519\text{ million}/0.591 = R21\,182\text{ million}$).

- **Phase Two:** At a labour-intensity of 9.8%, FTEs amounted to 469 206 and wages to R8 500 million. If expenditure had matched allocation then, even at the low level of labour-intensity, FTEs and wages could have risen to 2 550 033 and R46 200 million respectively. Once again, for *mandatory* categories of infrastructure, labour-intensity should be at least 30%. Therefore, for the *actual* expenditure, FTEs and wages should have been of the order of 1 436 345 and R26 020 million. If labour-intensive methods had been used properly and expenditure had matched allocation, then FTEs and wages could have risen to 7 823 230 and R141 721 million.²⁵

One of the reasons for separating the data into Phases One and Two is to illustrate that the labour-intensity continued decreasing, as was shown in detail in an analysis of Phase One.²⁶

Figure 2 (see first article in the May 2018 edition of *Civil Engineering*) showed total EPWP expenditures as a percentage of total allocations. The percentages for the Infrastructure Sector can be found in Table 3.

Table 3 Infrastructure Sector – expenditure as a percentage of allocation

	Percentage expenditure/ allocation
2004/05	67.6
2005/06	49.1
2006/07	52.2
2007/08	53.8
2008/09	64.3
2009/10	35.4
2010/11	29.0
2011/12	18.8
2012/13	7.3
2013/14	12.1

Opportunities foregone – aggregated Phases One and Two

If labour-intensity of 30% had been achieved for actual expenditure:

- Labour-intensity: would have been at 30% instead of 10.1%
- Employment in FTEs: $2\,321\,888 \{(781\,433/10.1) \times 30 = 2\,321\,888\}$
- Wages: R38 634 million $\{13\,007\text{ million}/10.1 \times 30 = 38\,634\text{ million}\}$

If *allocated* expenditure had been spent at the existing *low level* of intensity:

- Actual employment in FTEs at the existing low level of labour-intensity: 781 433
- Possible employment at low level of labour-intensity, if allocated expenditure had been achieved: 3 300 870 FTEs $\{781\,433 \times (542.8/128.5) = 3\,300\,870\}$
- Wages: R54 943 million $\{13\,007\text{ million} \times (542.8/128.5) = 54\,943\text{ million}\}$

Severe shortfall between allocations and expenditure and the implications thereof

While the above analysis has revealed serious inadequacies with regard to labour-intensity, it also revealed something very important (perhaps more important), namely the serious inability of the current authorities to spend the funds allocated to them. The funds allocated for Phases One and Two amounted to R543 billion. Expenditure amounted to R129 billion, i.e. 24%, or not quite a quarter of the total allocation. Crudely speaking, four times more infrastructure could have been constructed and four times the skills developed and employment generated even at the low levels of labour-intensity. If *allocated* expenditure had been spent *labour-intensively*:

- Possible employment could have been 9 807 944 FTEs $(542.8/128.5) \times 2\,321\,888 = 9\,807\,944$, i.e. *almost ten million* FTEs.
- The Infrastructure Sector of the EPWP could have resulted in an average of *almost one million* FTEs per year, instead of *less than 80 000*.
- Wages would have been R162 472.5 million $(542.8/128.5) \times 38\,463\text{ million} = 162\,472.5\text{ million}$.

In summary

Above the author has shown that in Phases One and Two the numbers employed were 781 433 (FTEs), while wages amounted to R13 007 million. Using proper labour-intensive methods, there should have been 2 321 888 FTEs, and wages would have risen from R13 007 million to R38 634 million. If the funds allocated had been spent at even the low levels of labour-intensity, FTEs would have amounted to 3 300 870, and wages would have been R54 943 million. If allocation had been spent using proper labour-intensive methods, we could have seen of the order of 9 807 944 years of employment generated, which is of the order of *one million FTEs for each year* (wages: R162 742 million).

Also important, as we will see below, large numbers of matric-level *hands-on-site supervisors* would have been trained ('rule of Roman thumb': one trained supervisor is required to ensure the productive employment of ten unskilled workers).

Assets produced

Before passing to an analysis of the results regarding labour-intensity and employment creation, it would be remiss not to discuss the limitations regarding a thorough record of the assets produced. This will be dealt with in some detail with respect to Phase One and only requires two comments regarding Phase Two.

Why does the author consider it important to discuss 'assets produced'? Because the construction and maintenance of assets was a major focus of the original formulation of the EPWP. The recording of the quantity of an asset produced is standard engineering practice. It is difficult to imagine a major construction project not having aggregated data regarding what has been constructed and maintained. The absence of such data, particularly in view of the immense attention, time and effort paid to the collection of ID numbers and gender of the workers, highlights the extent to which the actual infrastructure being constructed was considered to be of peripheral importance.

Official projections and physical results: Phase One

In the 2004 *Consolidated Overview* it was stated that:

Of the one million temporary work opportunities, 750 000 would be created in the infrastructure sector and 250 000 in the environmental, social and economic sectors. These work opportunities would be created during the normal provision of public assets and services. In the infrastructure sector 37 000 kilometres of road, 31 000 kilometres of pipelines, 1 500 kilometres of stormwater drains, and 150 kilometres of sidewalks would be constructed using labour-intensive methods (EPWP 2004:7).

In the 2010 *Presidential Report* (page 18) it was stated that:

Approximately R15 billion (or one third of the total budget) was spent on labour-intensive construction and maintenance. On average, the labour content of infrastructure projects was increased from 5% to 30% of project costs, being highly competitive with machine-intensive construction methods.

In itself this is a distortion of events. The original budget for the Infrastructure Sector of the EPWP was indeed R15 billion, which was 75% of the original budget. In the event R41 billion was spent on infrastructure through the EPWP, i.e. 280% of the original budget for the construction projected for the various categories in 2004. To claim that “R15 billion (or one third of the total budget) was spent on labour-intensive construction” is sleight of hand. *While this official report may have made the Programme appear to be more successful than it was, it also distracted from the actual potential of labour-intensive construction and the immense improvement in skills, employment, income and poverty alleviation this would have resulted in.*

More importantly, the *Presidential Report* claimed:

As per the targets set in this regard, approximately 37 000 km of roads, 31 000 km of pipelines, 1 500 km of stormwater drains and 150 km of urban sidewalks have been constructed using labour-intensive methods.²⁷

This is an egregious misrepresentation of reality. No aggregated data was collected regarding the quantity of infrastructure constructed, let alone by category of infrastructure. It is doubtful whether it would be possible to find out the amount of infrastructure constructed without an immense, countrywide investigation of each project.

As important – expenditure on infrastructure in Phase 1 amounted to R41 billion. The projections were based on an expenditure of R15 billion. If we were to accept the data reported in the *Presidential Report*, then Phase 1 constructed *only 37% of the infrastructure* that should have been produced for the actual expenditure.

Unfortunately, as mentioned above, the amounts of physical assets produced were not contained in the summary reports for Phase One and were not mentioned in the text.

However, it has been noted above that the absence of actual evidence did not prevent the *Presidential Report* from claiming that the amount of infrastructure produced had

It is extremely disturbing that no attempt has been made to obtain the total amounts of the different types of assets produced during the expenditure of over R128.5 billion, especially given the amount of time and effort focused on the recording of the details related to the number of work opportunities. In itself this indicates that the infrastructure component of the EPWP was viewed as primarily relief or social welfare.

been approximately as declared in the original “Consolidated Programme Overview.”²⁸ (EPWP 2004).

This failure to collect any aggregated data on the type and quantity of infrastructure persisted in Phase Two. There was no attempt to produce aggregated data, even questionable data such as that for Phase One, for the infrastructure constructed.²⁹

Comment regarding lack of data on infrastructure constructed

It is extremely disturbing that no attempt has been made to obtain the total amounts of the different types of assets produced during the expenditure of over R128.5 billion, especially given the amount of time and effort focused on the recording of the details related to the number of work opportunities. In itself this indicates that the infrastructure component of the EPWP was viewed as primarily *relief or social welfare*. It thus diverged from the original objective of serious engineering, which also addressed training, skills development, productive employment creation and development. *Skills development is an essential, precursory and preparatory component of productive employment creation.*

In conclusion to this section

The above analysis was carried out in relation to the Infrastructure Sector of the EPWP. It revealed serious inadequacies with regard to labour-intensity and the negative implications for skills development, employment and wages.

During this investigation it also revealed something very important (perhaps more important) – the serious inability of the current authorities to spend the funds allocated to them, resulting in negative implications for skills development for matriculants, employment and wages. Note the huge increase in employment and wages that could have been achieved – firstly by increasing the labour-intensity, secondly through the expenditure of the funds allocated (even at low-labour intensities), and in the third place (but actually the first prize), using the allocated expenditure labour-intensively.

REASONS FOR COMPARATIVE FAILURE

The reasons for the lack of success may be placed in three different categories:

- Over-arching route adopted for implementation
 - No programme, no linked training, no in-house capacity
 - Use of small contractors and contract, without taking due cognisance of the well-known lack of training and contracting ability at this level
- External to the public works programme
- Internal.

Over-arching route adopted for implementation

As for the NPWP, the EPWP is a programme in name only. Most of its projects derive their funding from the Municipal Infrastructure Grant (MIG) and are re-labelled EPWP.

Thus, despite its title there is no actual Programme in the sense of overall planning, training, construction and maintenance (the 'hallmarks' of a proper Programme).

As for the NPWP, the EPWP did not follow most of the essential elements of the model derived from experience elsewhere in Africa:

- It did not establish a long-term planned series of related infrastructure projects.
- It did not establish a formal training programme.
- It did not establish any 'in-house' construction capacity based on *instruction* within any of the public sector authorities.
- By contrast with the establishment of an 'in-house' capacity based on *instruction*, a major difference from the model is that (as for the NPWP), delivery was through the medium of *small contractors* (and therefore the *contract*).

Having chosen a fundamentally different route, there were also both external and internal reasons for the shortcomings.

External reasons

The main external³⁰ reason is that the South African construction industry is fundamentally capital-intensive. Thus there already exists a *socio-technical system* of construction that is based on the use of fuel-powered, heavy-equipment.

This *socio-technical system*, including the associated mind-set of all engaged in the construction industry, is oriented towards the use of heavy equipment – from concept, through design, contract documentation, tendering to implementation.

Orientation towards capital is exacerbated by prejudice regarding the use of supposedly backward and *not modern* methods. Most engineers reject the concept of labour-intensive construction.

Rejection stems in part from the lack of understanding of the principles and practice of modern labour-intensive construction. Most engineers do not know that the effective use of these methods is based on new information, techniques, training and organisation. The lack of understanding is aided and abetted by vigorous contention that there is nothing worth understanding.³¹

If there is some understanding, there is resistance to the necessary commitment in time and effort that is essential to re-engineer the process.

These attitudes are supported by four 'lies': labour-intensive methods result in higher cost, longer time, much lower quality and are more difficult to manage.³² These 'lies' have important implications.

Engineers advise public sector policy/decision-makers, where they play a crucial role. They advise policy-makers that labour-intensive methods cost more, take longer, are more difficult to manage and result in a very low quality of product.³³ This is detrimental to the achievement of 'secondary' socio-economic objectives during the construction and maintenance of physical infrastructure.

The prevalence of the existing socio-technical system (and its mindset) is not helped by the fact that there is a general lack of understanding on the part of public sector officials as to the principles and potential of labour-intensive construction. Consequently there

is little understanding on the part of officials of what has to be put in place to achieve the potential in terms of the time and effort required, which in turn is exacerbated by *wanting it all and wanting it now* (or at least before the next election).

Internal reasons

Although already mentioned under the "Over-arching ..." section above, the fact that the EPWP did not establish a planned, long-term, integrated training and construction *Programme* also needs to be included as an *internal reason* because it has important implications which cascade throughout the EPWP. The fact that there was no actual programme is closely related to the fact that there was no development of in-house capacity.

The lack of an in-house capacity to implement labour-intensive construction from design through contract documentation to site work, means that there is no in-house capacity or competence within public bodies to assess and evaluate the quality of implementation.

This has been outsourced to consultants.³⁴ Unless these consultants have been thoroughly trained, they cannot design labour-intensive projects, or prepare appropriate contract documentation. The same applies to the need for contractors and site-supervisors to be properly trained.

In turn, this is one of the reasons for the absence of 'enforcement' of the contractual conditions and specifications, which will be highlighted below.

Lack of re-engineering of product and process

Above we have seen that thorough incorporation of labour-intensive methods into individual projects can only be achieved by re-engineering the whole construction process from conception, through design and specification to implementation. This is achieved by designing the project from the start to be built by hand. In formal project management language an objective such as this is referred to as the 'design driver'. Having designed the project to be built by hand, the contract documentation must follow suit. The implications of the decision to make greater use of productive labour must be rigorously incorporated into the contractual documentation. This includes modification of each section of whichever contract is used – the project specifications, the bills of quantities, and the tender and evaluation process. Subsequent construction has to be in accordance with the contract.

This is re-engineering of product and process for individual projects. The process required for large-scale, long-term implementation will be dealt with in more detail further on.

Below we will deal in more detail with the difficulties that have been experienced regarding contract documentation. Here we will list other examples from the perspective of the required re-engineering:

- Re-engineering was necessary to address the supposedly *mandatory* categories mentioned above.
- More generally, all earthworks operations provide major opportunities.
- Engineers did not take advantage of these opportunities.
- They did not re-engineer the projects – new designs were not prepared, the greater use of productive labour was not the design driver, and appropriate specifications were not included in supposedly labour-intensive contracts.

In the light of international research and experience, supplemented by research and experience carried out at the University of the Witwatersrand (Wits), it is clear that engineers failed to carry out sufficient re-engineering of the *product*.³⁵

The next sub-section amounts to a continuation of the above list. It is so important that it deserves a sub-section on its own.

Failure to obey mandatory conditions contained in DORA

As we have seen for the expenditure of PIG and MIG funds, the Division of Revenue Act made it *mandatory* for public bodies to use labour-intensive methods for low-volume roads, stormwater drainage, sidewalks and trenches. These categories provide major opportunities for the substitution of equipment by labour. These supposedly *mandatory* conditions were simply ignored.

It is particularly egregious that this has not been done in relation to the supposedly *mandatory* categories, which are particularly amenable to construction using highly labour-intensive methods. It is a prime example of a more general failure to re-engineer first the product and then the process.

Contract and contractor development

Since the EPWP decided that delivery had to be via small contractors, the contract became a critical component of re-engineering the *process* whereby labour-intensive construction had to be implemented on individual sites.³⁶

From a more general perspective, the broader process for large-scale implementation, the whole question of *small contractor development* also became critical, as did their *actual behaviour during implementation*.

We will deal first with the contract, then with contractor development.

Contract

We have seen above that Conditions of Contract and Specifications were developed for the Framework Agreement (1993). They were oriented towards all the specified work being done by hand.³⁷ We have also seen that, unfortunately, the legislation was not yet in place to allow this to be fully implemented.

In 2005 *Guidelines* were produced for the EPWP that contained recommendations regarding both contractual details and specifications. Much of the content was derived directly from the Framework Agreement document, which stemmed directly from Crosswell's work.

Although these and other guidelines exist, it is not widely appreciated that considerable time and effort are required to incorporate various recommendations into standard designs and documentation in order to ensure/compel the use of a

Since the EPWP decided that delivery had to be via small contractors, the contract became a critical component of re-engineering the process whereby labour-intensive construction had to be implemented on individual sites.

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significant increase in the use of labour-intensive methods. This is *much more complex* than anticipated. For example, *in relation to the contract, detailed attention is required to add to and modify nearly every section in standard contract documentation and subsequent tender procedures.*³⁸

Unless this is done there will not be a significant use of labour-intensive methods. Very few consultants have the knowledge, time and resources required to carry out a thorough revamp of their standard designs, documents and procedures. Therefore they are unable to re-engineer the processes without incurring, especially for the first project of its type within the consulting company, much higher than normal costs to their company.

As important – the wording as included in the 2005 *Guidelines* allowed for a weak interpretation of the extent to which labour-intensive methods should be employed. There are several what may be termed ‘cop-out’ clauses. For example: “Use labour-intensive methods wherever feasible.” The engineers and managers simply say, “These methods are not feasible for these categories of construction.” This is partly a reflection of their lack of knowledge, partly that they do not have the requisite in-house experience, and partly a resistance to the additional time and cost implications of the re-engineering required. It is easier to reject the labour-intensive component from the outset. Neither the Municipal Manager nor the responsible official within local government has the knowledge or experience to counter this advice. In addition, neither the public authority nor the consultant enforced the contracts. The combination of the above led to tokenism and ‘business as usual’ (conventional construction using fuel-powered heavy equipment), which is exemplified by the extremely low level of labour-intensity (10%) over the ten-year period.

The EPWP issued revised *Guidelines* in 2015. These are still not up to the task, and now even exclude some of the provisos and conditions which previously contributed to attempts to enforce the provisions of the *Guidelines*.

Delivery by small contractors

In relation to the establishment of an alternative socio-technical system, the reliance on the use of *small contractors* has not resulted in a significant increase in employment created per unit of expenditure, because LIC has not been insisted upon, despite the contractual requirements.

Furthermore, the use of small contractors has been both cumbersome and ineffective. In reality, for contractors the immediate need is to run a successful business. This is far more

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important than skills development and employment creation (no matter how important the latter are to government). One of the main reasons for advocating modern labour-intensive methods, is that it *lowers the barrier to entry*, because less up-front capital is required. Perversely and ironically, lack of understanding of the principles has led to demands for support to own and operate heavy-equipment. In the conditions prevailing at the local level this has further complicated matters.

Above we have seen that, having designed the project to be built by hand (re-engineered), the contract documentation must follow suit. (The implications of the decision to make greater use of productive labour must be rigorously incorporated into the contractual documentation.)

Subsequent construction has to be in accordance with the contract. Above we have outlined the lack of re-engineering on the part of consultants. The following practices were observed in relation to the contract and the use of small contractors:

- Some of the contracts included clauses that indicated that labour-intensive methods would be used, but the clauses were ignored.
- Contracts were awarded to small contractors who did not know how to use labour-intensive methods.
- Projects were merely relabeled “labour-intensive” with no increase in labour content, because the engineer knows that a typical politician cannot tell the difference. Projects were then implemented using conventional, capital-intensive methods, resulting in ‘business as usual’. People waving flags are carrying out an important safety-role, but they would be doing the same on a conventional project; they do not contribute to *any* increase in employment per unit of expenditure.
- As cynical, but just as damaging, was to continue with ‘business as usual’ while employing a few extra people to sit under a tree, next to the site where the equipment was operating, so that the employment figures recorded were higher, and the requisite ‘box could be ticked’.³⁹ Usually even this tokenism was not considered necessary.

In closing this list of sins of omission and commission, we need to take note of the lack of enforcement:

- To the best of the author’s knowledge no enforcement of contractual clauses was made.
- The lack of enforcement on the part of officials and consultants has allowed the default construction position: ‘business as usual’ (or worse: tokenism).

In closing this sub-section – there have been many emerging contractor programmes, but the CIDB (Construction Industry Development Board) itself has reported that these have not been as successful as envisaged.⁴⁰ On the plus side, some contractors have been trained, but there are people out there who need to be found and utilised.

The route chosen for delivery of the EPWP – small contractors – has not achieved the results anticipated. The whole question of small contractor development and the implications for policy is being investigated and analysed at Wits.⁴¹

Insufficient training, and in particular no linked training programme, for hands-on site and multi-site supervisors

Above we have discussed the thorough training required at all levels in relation to modern labour-intensive construction. With

As a result of the negotiations with COSATU during the formulation of the Framework Agreement there had been a stated commitment to training. In principle this formed part of the NPWP, but very little training took place.

this datum in mind, the following may be stated about training in relation to the EPWP:

Orientation, education and training of policy-makers and engineers

Specific training was given to over 1 200 engineers and officials – NQF7 (orientation at policy and senior engineering level) and NQF5 (engineering site level).⁴² The training material had been officially approved.

While one might claim that the training was adequate in relation to senior-level orientation, it is clear that it was ineffective given the lack of improvement in labour intensity. Also, while many attended the courses, far fewer completed the portfolio required for the actual qualification.

The absence of a proper framework might be partly responsible. Probably more importantly, after a brief flurry of concern which motivated the industry during 2004 and 2005 (similar to that which had alarmed the industry immediately post-1994), the industry gradually began to realise that there was no enforcement and thus it could return to 'business as usual'.

It was frequently reported during training sessions that the difficulties of actual implementation overcame any knowledge gained during the training. Furthermore, insufficient numbers of senior decision-makers actually took part in either the orientation or the training sessions.

Single- and multi-site training of hands-on site supervisors

As a result of the negotiations with COSATU during the formulation of the Framework Agreement there had been a stated commitment to training. In principle this formed part of the NPWP, but very little training took place.

In the first five-year phase of the EPWP there was an actual stipulation of two days training for every 22 days worked (an improvement on the NPWP). However, very little of any training was of the technical and organisational nature pertinent to the production of hands-on site supervisors. Where training took place it was mostly life skills oriented, not technical. In Phase Two this was replaced by placing the onus for any training on each individual project. Results have not been reported.

One may safely conclude that, as for the NPWP, no *systematic technical training system* was established during the first two phases of the EPWP.

We have seen that the lack of technical and organisational training was not for a lack of a functional South African model or accredited training material.

The type of thorough training required to produce single-site and multi-site supervisors was described in Part 1 (see Part 1 of this set of articles in the May 2018 edition of *Civil Engineering*) in relation to the Donaldson Trust/Wits/Umsobomvu Training Programmes in Greater Sekhukhune. But this endeavour had nothing to do with the EPWP.

As mentioned earlier, in a mid-term review of EPWP in the Free State (2007), one analyst – not known to the author – carried out a review of the Free States EPWP. It was actually stated that the training in Sekhukhune should be the model for the national EPWP. The recommendation was not heeded.⁴³

Conclusion to this sub-section on training – the lack of an integrated training and construction programme

Above it was shown that elsewhere in Africa large-scale, long-term programmes were established – expansion in the scale of construction was formally linked to, and dependent upon, the training of engineers and hands-on single- and multi-site supervisors.

Nowhere in the EPWP in South Africa was there a formal programme that linked the essential formal training required with a planned construction programme. Formal linkages were not established between construction projects and technical, supervisory and contractual training.

It cannot be overstated that specific training is required for all concerned at all levels – national, provincial and local authorities, engineers (site and design), and a range of skilled site personnel, and of critical importance are *hands-on single- and multi-site supervisors*.

The author will provide only one final snapshot regarding training – in the original June 2004 Consolidated Programme Overview and Logical Framework it was stated that a National Training Centre would be established. This had still not happened by the end of Phase Two, ten years after the commencement of the EPWP.

Drift back to social welfare

At the Programme level there has been a drift to greater concern for social welfare at the expense of attention to technical detail.

This is epitomised by the fact that data has not been collected at project level as to the amount of building and infrastructure; consequently there is no aggregated data as to the amount of product produced during the expenditure in the Infrastructure Sector of over R128 billion.

By contrast the 'Monitoring and Evaluation System' was set up in order to provide data-based evidence for management decisions. In the event, an immense amount of time and effort has been spent on collecting individual ID numbers and 'days worked'.

In conclusion to this section on reasons for failure

From the above analysis it may be understood why the author considers that this so-called *Programme* has not resulted in *anywhere near* the levels of skills development, employment creation and poverty alleviation that could have resulted if the original precepts had been understood and sensible procedures followed.

These shortcomings threaten the achievement of the Objectives of Phase 3.

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John Howe, both of whom made significant contributions to this field of endeavour. □

REFERENCES

The list of references for the full set of articles is available from the author.

NOTES

- 1 The NPWP was the implementation of a component related to Public Works in the ANC's Reconstruction and Development Programme.
- 2 Please note, at this time the South African Government was not involved.
- 3 Core members of the 'team' which formulated and drove the Framework Agreement: COSATU (Leonard Ramatlakhane, Dumisani Nthuli, Lisa Seftel), Construction Industry (Graham Power, James Crosswell, William Vance), Academia (Robert McCutcheon, Sean Phillips). James Crosswell was primarily responsible for all the details regarding contract documentation, specifications and contract clauses.
- 4 James Crosswell was primarily responsible for all the details regarding contract documentation, specifications and contract clauses.
- 5 The unfortunate implications of the shortening of the full title were not anticipated.
- 6 McCutcheon and Phillips 1994.
- 7 Championed by Lisa Seftel and Jacqui Bouille. For more details see McCutcheon 2001a and 2001b, and McCutcheon and Taylor Parkins 2003 "Chapter 14: Employment intensive methods and the use of contractors."
- 8 Department of Labour. Government Gazette No 35310, 4 May 2012.
- 9 The two-year time restriction has since been removed.
- 10 Emphasis added.
- 11 Training removed.
- 12 "EPWP conditions have been placed on the PIG and MIG via the 2004 Division of Revenue Act." EPWP First Quarterly Report, Financial Year 2004/05, 1 April – 30 September 2004, 9 September 2004. The Framework Agreement was incorporated into the National Public Works Programme, 1994, and formed the basis of the Ministerial Determination, Special Public Works Programmes and its Code of Good Practice (2002 updated 2012). The essential principles were negotiated with COSATU and SANCO, and since then have been agreed at NEDLAC.
- 13 "EPWP conditions have been placed on the PIG and MIG via the 2004 Division of Revenue Act." EPWP First Quarterly Report, Financial Year 2004/05, 1 April – 30 September 2004, 9 September 2004.
- 14 "Programme" is frequently used instead of EPWP, to emphasise that it should be a proper Programme, not just labelled one.
- 15 The value of the Rand has fluctuated; for simplicity \$1 equaled R12.
- 16 This results in an increase of 300% to 650% in labour-intensity (and, concomitantly, skills and employment) and therefore in income accruing to labour.
- 17 It is usually far less.
- 18 EPWP Unit, 2013. EPWP Unit November 2013: p 10. It is interesting that the original in the Overview Version had added: "This will scale up from 500 000 per year in 2009 to 1.5 million in 2013/14". EPWP Unit 9 January 2009: p 6.
- 19 Hon Thulas Nxesi: Budget Vote Speech for 3013/14 Parliament May 2013. See also greater detail on references in NDP and State of Nation and Budget speeches.
- 20 Full-time Equivalents (FTEs): an FTE equals the number of days worked divided by 230.
- 21 Also that not all the allocated expenditure should be considered as amenable to labour-intensive construction. Again this may be the case. But far more of this allocated expenditure is amenable to the use of highly labour-intensive methods than currently considered.
- 22 All data has been derived from the DPW EPWP Quarterly Reports and other official reports.
- 23 Although there has been a severe inability to spend the allocated budget, the allocations indicate the scale of internal resources available to South Africa.
- 24 See McCutcheon and Taylor Parkins 2012.
- 25 It is acknowledged that this would have required everything to be working regarding both expenditure and the proper use of labour-intensive methods. However, the difference between this potential and the reality is surely worth aiming for?
- 26 McCutcheon and Taylor Parkins 2012.
- 27 DPW EPWP 2010: p 18.
- 28 EPWP Unit 2004: p 7.
- 29 It has been stated that physical product will be recorded in Phase Three.
- 30 'External', that is to the EPWP.
- 31 Quote from early 1990s: "The proposals contained in your letter are too outlandish and too irregular to even contemplate, much less to which favourable consideration may be given." Procurement Officer, KwaZulu-Natal Tender Board, to Crosswell Shepherd and Partners, Ref No TB 13/1: TB 12/2/3, 8 June 1992. These attitudes are not confined to South Africa. Modern labour-intensive construction is counter-intuitive to the mind of the 21st century industrialised world.
- 32 Crosswell has emphasised these four 'lies'.
- 33 McCutcheon *et al* 2007.
- 34 Both 'outsourcing' and 'in-house' capacity require detailed attention in their own right throughout the construction industry, irrespective of 'labour-intensive construction'.
- 35 From the above it should not be surprising that there has been a lack of the re-engineering of both product and process required to establish an alternative modern labour-intensive construction industry. In relation to the product very little attention has been paid to re-engineering design and specifications.
- 36 Above it was shown that elsewhere in Africa large-scale, long-term programmes were established: expansion in the scale of construction was formally linked to, and dependent on the training of engineers and 'hands-on' single- and multi-site supervisors.
- 37 And simple equipment.
- 38 This includes modification of each section of whichever contract is used: the project specifications, the bills of quantities, the tender and evaluation process.
- 39 LITEworks 2008.
- 40 "(t)he overall success of CDPs is somewhat questionable." (CIDB March 2009) and "Overall, most of the programmes have not performed as they were envisaged in the development of contractors." (CIDB October 2011).
- 41 Based on several studies carried out between 2014 and 2017, a paper is being prepared dealing with small contractor performance and the implications for policy.
- 42 The author played a role in this training.
- 43 Free State Department of Public Works, Roads and Transport, "An Impact Study of the Implementation of Expanded Public Works Programme in the Free State: Mid Term Review Final Draft", 05 May 2008: p 38.