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POLICY AND THE PAST

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THE NATIONAL PUBLIC WORKS PROGRAMME 1994-1998: DOES THE PAST SUGGEST THE FUTURE?

R T McCutcheon and W D Thwala

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1.1 INTRODUCTION

Unemployment remains one of South Africa's most pressing problems. At the same time there is a great need for physical infrastructure in both urban and rural areas. In addition there is a lack of individual skills and institutional capacity. From a theoretical perspective, supported by large-scale experience elsewhere in Africa and research and development in South Africa, there are reasons for advocating that the establishment of formulated programmes using labour-intensive methods would result in the construction and maintenance of the required infrastructure, generate employment, develop individual skills and improve institutional capacities. (The principles, process and results provide a datum by which to compare other programmes.) Based on this approach a National Public Works Programme (NPWP)* was launched in 1994. After providing some essential background, this article will briefly describe and discuss the progress of South Africa's NPWP.

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* Its full title was the "National Employment Creation Programme Using Labour-intensive Methods for the Construction and Maintenance of Public Infrastructure". This became known as the NPWP.

2. BACKGROUND[1]

2.1 General

Unemployment

In South Africa the level of unemployment is extremely high. Depending upon the formal definition used official rates vary from 25%* to 35%. For some sectors it is much higher: excluding those being educated, the rate for the 16-19 age group is 60-70%;[2] in various settlements it is estimated at 70%. It is doubtful whether a democracy can withstand these levels of unemployment for very long.

Lack of Infrastructure, Individual Skills and Institutional Capacities

There is a great need for building (housing, education, health) and infrastructure both urban (water supply, sewerage reticulation and treatment, storm water drainage, streets, electrical supply and waste disposal) and rural (services for settlements; dams; irrigation canals; roads). These are set within a low level of individual and community capacity in both technical and institutional terms. An exemplification of the legacy of apartheid is that until very recently, of 10 000 'black'** school entrants only one would complete 12 years of schooling and be eligible to study either engineering or medicine. In 1972 there were 6 000 apprentices in the building industry, recently there have been about 500.

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* The definition that results in 25% excludes from consideration those no longer actively seeking employment.

** The Constitution no longer has racial categories, however, this usage has been adopted by the Centre for Statistical Services (CSS) as short-hand to capture the fact that apartheid resulted in the majority of the poor and disadvantaged being 'black'.

From a theoretical perspective, supported by experience elsewhere in Africa, there are reasons for considering that properly formulated programmes using employment-intensivemethods of construction and maintenance can generate employment, provide good quality infrastructure and enhance individual skills and institutional capacities.

Large-scale Employment-Intensive Programmes in Sub-Saharan Africa (excluding South Africa)

Elsewhere in sub-Saharan Africa large programmes using employment-intensive* methods for the provision of physical infrastructure have achieved several important and complementary development objectives:

- a significant increase in employment generation per unit of expenditure;
- the construction and maintenance of technically sound and economically efficient assets;
- the development of individual skills: technical, supervisory, managerial, administrative and entrepreneurial; and
- the building of institutional capacity at local, regional and national levels.

How can this be demonstrated? Examine the results of documented programmes. A few sentences will suffice to show the scale and scope of achievement. Every day over 10 000 people are employed in Kenya on the construction and maintenance of low-cost,

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* Employment-intensive ≡ labour-intensive ≡ labour-based. The switch to 'employment-intensive' has taken place because the word 'labour' focuses attention upon the labourer and ignores the extent to which the success of this type of work depends upon appropriate policy, institution, organisation, training and management.

rural roads. Since 1974 over 12 000 kilometres of these roads have been constructed and maintained. For Botswana, since 1980, the figures are 3 000 people and 2 000 kilometres respectively. Comparable results have been achieved in Ghana, Lesotho and Malawi.

The theoretical foundations of labour-intensive construction were formulated in the early 1970s. Civil engineering construction provides an opportunity for the substitution of labour for equipment. Labour-intensive construction may be defined as the economically efficient employment of as much labour as is technically feasible to produce as high a standard of construction as demanded by the specification and allowed by the funding available. The result is a **significant** increase in employment opportunities per unit of expenditure (for example, from 10% to 30-65% of *total* construction costs [i.e. an *increase* of 200 to 550%]; *not* an increase of 10 to 50% in the labour cost [i.e. resulting in labour costs rising only from 11% to 15% of total construction costs]). Labour-intensive methods also substitute local for imported energy. Essentially, labour-intensive construction has two main objectives:

(i) a technically sound (good quality), economically efficient product: equivalent to that achieved by conventional construction; and

(ii) a **significant** increase in the use of labour per unit of expenditure.

Successful site implementation regarding technical feasibility and economic efficiency depended upon the following basic principles:

- The projects must be treated as proper engineering while giving serious consideration to social benefits besides the product itself.
- Type of work must be appropriate to employment-intensive methods.
- Detailed technical analysis must be carried out.

- Design, specifications and documentation should be appropriate.
- During pilot projects method and work studies should be carried out, iteratively, to reveal:
  - (i) the various operations and optimal sequencing of such operations;
  - (ii) the various activities within each operation;
  - (iii) the individual and group tasks appropriate to the different activities and operations;
  - (iv) the balancing of the work force required for activities and operations.*
- As far as possible the work must be based on individual or group tasks. In the case of individual tasks, it has been found that these can only be specified for about 60% of highly labour-intensive work.
- Conditions of employment must be appropriate.
- 'A fair day's wage for a fair day's work' and 'a fair day's work for a fair day's wage'; and a corollary: no work, no pay.
- The labourers make their own way to work: transport to site is their responsibility.
- Training must be extensive and good at what it sets out *to do*: particular attention must be paid to site supervisors (road builders) and multi-site supervisors (sites supervisors or managers).
- The labourers must accept instructions given by trained road builders.

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* This type of analytical work is not peculiar to labour-intensive work. It forms part of standard procedure with regard to the use of equipment; for example, balancing the numbers of excavators, loaders and trucks required for cut and fill. However, it is curious how often 'balancing' is ignored in labour-intensive work. The labourers are then blamed for standing around doing nothing.

- There should be close liaison between site work and the local community; but liaison must *not* be the responsibility of the site supervisor.
- Sites must be well organised.
- Strong organisations are required with good management systems.

The last five do overlap with some of the factors influencing programme development. They are retained here because of their importance for day-to-day site performance.

Drawing upon experience and analysis of the programmes in Kenya and Botswana in particular, it is considered that the following are the main reasons for success of large-scale programmes:

(i) Programmes were long-term and national (not *ad hoc* projects).

(ii) There was a sound intellectual assessment of the technical feasibility and economic efficiency of using labour-intensive methods: cognisance was taken of technological and institutional capacities.

(iii) Technical, institutional, organisation and socio-economic aspects received concentrated attention during preliminary work, continued through pilot projects, embryonic training programmes, and subsequent national programmes. Technical matters included type of work appropriate to labour-intensive methods, detailed technical analysis, design, standards of construction, specifications, documentation, tender procedures, tools and equipment, and methods of construction. Institutional matters included the decentralisation necessary for grassroots success and the centralisation necessary to plan and co-ordinate a large programme. Organisational aspects included management structures, contractual arrangements, and systems (recording, reporting, controlling, monitoring and evaluation) and training. Socio-economic aspects included wage rates, conditions of employment,

labour supply, role of women and social impact studies. Prior agreement was reached between the different parties with regard to wage rates, conditions of employment and the role and responsibilities of the community. As far as possible the work was based on individual and group tasks. 'A fair days work for a fair days wage' and vice versa. Close liaison between project, programme and local community.

(iv) Strong organisations were established with good management systems; a balance was achieved between decentralisation and centralisation.

(v) Training was extensive and good at what it set out to do; in particular road builders and multi-site supervisors.

(vi) There was long-term political support.

(vii) There was long-term financial commitment.

(viii) On balance there was good co-ordination between the government, government departments, those administering the programme, local authorities, those providing technical assistance and donors.

And the corollary: they were *not* short-term emergency relief projects.

2.2 Large-scale Projects and Programmes in South Africa Prior to 1994

Review of the work elsewhere in Sub-Saharan Southern Africa had at least two implications for South Africa. The programmes in Kenya and Botswana have demonstrated that good-quality, low-volume rural roads may be constructed and maintained by highly labour-intensive means: five to seven times more employment being generated per unit of expenditure. The increase was achieved by the identification of the type of work which could incorporate a significant increase of labour per cent of

expenditure and then through extensive investigation of economically efficient implementation. Secondly, the potential had been proven in large-scale operations over a fifteen to twenty year period.

However, by contrast to other sub-Saharan experience, the results of large-scale work in South Africa has been unimpressive. From 1980 to 1994 *billions* of rands* were spent on projects and so-called programmes with stated objectives of both creating employment and providing physical infrastructure such as roads, water supply and sanitation. To these objectives community participation and entrepreneurial development have often been added. Analysis of this experience[3] revealed several disturbing characteristics:

- Very little sustainable employment was created.
- The assets constructed were not cost-effective, of doubtful value and ill-maintained (the results have often disappeared).
- Little national, provincial and local institutional capacity building took place. Internal planning, data collection, monitoring and control were severely lacking. Independent evaluation was noticeable in its absence. Given the lack of systems planning and monitoring, systematic evaluation would have been extremely difficult anyway.
- The expenditure on development failed to reach the target group to the extent envisaged.

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* During a period when the Rand varied from R1,5-R2,5 to the US Dollar.

- Individual skills were not improved. Training, where present, was not particularly appropriate or focused and has not shown itself to be carried through into post-project employment.

The majority of the so-called labour-intensive work had been either conventional or labour-*ex*tensive: conventional construction does not produce additional employment per unit of expenditure; labour *ex*tensive work is the temporary employment of large numbers of people to produce products of doubtful value without much concern for time and cost (these projects re-enforce the prejudice of those who cannot conceive of effective employment-intensive work).

In 1994, the Urban Foundation published in its *Research Report 8* a study carried out by the Economic Research Unit of the University of Natal: *Public Works Programmes in South Africa: A Key Element in Employment Policy?* In relation to availability and quality of data it stated:

> Although it was a relatively straightforward task to identify so-called labour-based public works projects currently being implemented in South Africa, it was exceptionally difficult to obtain data on these schemes.[4]

This is unacceptable.

In sum, the vast majority of expenditure on job creation has been unsystematic and certainly has not made effective use of labour-intensive methods (no institution, no programme, little planning and training).

2.3 Research and Development in Employment-intensive Methods in South Africa

Turning from large-scale projects and expenditure to research: the Research Centre for Employment Creation in Construction (located within the Department of Civil Engineering at the University of the Witwatersrand) indicates that significant employment opportunities may be created through the use of labour-intensive methods in the earthworks component of civil construction in general and for surfaced roads in urban areas in particular. In 1991 a cursory analysis of one component of civil construction work undertaken within a part of the public sector indicated that the number of people effectively employed in civil construction could be doubled - materially this would amount to increased opportunities for not less than 100 000 people (in an industry currently employing 60 000 people). Below it will be shown that a more thorough analysis revealed the potential for a significant increase.

But the research has gone beyond theory and estimates. In 1991 Phillips investigated the viability of reintroducing waterbound macadam as a base-course material. He found that there was the possibility for a ten-fold increase in the proportion of labour diverted to the construction of the base-course. Depending upon the assumptions made there was a financial premium of 10 to 70 per cent. As part of his PhD he carried out more detailed research into the financial trade-offs between cost and employment; depending upon assumptions made, employment could be increased by a factor of 40 (4 000 per cent increase). Such a finding encouraged further research (both from a technical and a national economic perspective) and should be of interest to anyone who is deeply concerned about the levels of unemployment. Over the past ten years over 20 Masters and PhD's have been awarded in this field and over 40 research reports, papers in refereed journals and conference proceedings have been produced.[5]

During the period 1994 to 1998 the analytical and laboratory work related to high standard road construction has been tested in the field. In collaboration with the Roads Directorate of the Greater Johannesburg (then Transitional) Metropolitan Council stretches of such road have been constructed using labour-intensive methods.[6] Collaborative research initiated by the South African Bitumen and Tar Association (SABITA) resulted in the publication of two manuals on labour-enhanced construction of bituminous surfacings.[7] Guidelines for the appropriate contract procedures and documentation for labour-intensive construction, the training of road-builders, and large-scale employment creation programmes have been prepared for the Development Bank of Southern Africa (DBSA).[8] During 1997 and 1998 labour-intensive methods were used for the construction of the base-course of 13 km of national route (the N1).[9]

Research continues to be carried out to determine the number of employment opportunities that could be created throughout the various sub-sectors of civil engineering. However, one may be fairly confident that in relation to the road network, potential for an increase in the employment of labour per unit of expenditure exists in the following categories:

(i) Rural roads: construction and maintenance of all standards of road. (While the use of labour-intensive methods for low-volume, low-cost roads is no longer problematic, the establishment of large-scale programmes is another matter.)

(ii) Urban roads and storm water drainage; construction of sub-base, base-course and wearing course for all standards of road.

In the meantime during the early 90s several public authorities and development agencies attempted to increase the use of labour-intensive methods by putting the onus upon the contractor. The contract documentation contained exhortations to use these

methods 'wherever feasible'.[10] There was a singular lack of effect. Such conscience salving exercises not only failed to understand that the greater use of labour-intensive methods starts with the design but also that at present the contractor is bound into a socio-technical system based upon the use of equipment and this cannot be changed overnight. On the one hand the designs, specifications and documentation hardly existed; on the other, the industry did not have the organisational structures, planning, procedures and supervisors to handle highly labour-intensive construction works. (However, we will see below that the industry was influenced to move in that direction but from a national perspective not from that of one client-consultant/contractor engaged on a single contract.)

2.3 Interim Lessons for the Future of Employment Creation Programmes in South Africa

There were several implications for South Africa of labour-intensive work throughout Africa (i.e. including South Africa): first for the technology and techniques, secondly for the widespread propagation of employment-intensive work.

Specifically: Rural roads may be constructed and maintained by highly labour-intensive means: 5 to 7 times (500 to 700 per cent) more employment being generated per unit of expenditure without sacrificing quality, cost or time. It is also possible to create a significant increase in employment opportunities per unit of expenditure across a wide range of civil construction: including most municipal/urban engineering services, and using contractors.

However, re-consideration of the national programmes of rural road construction and maintenance elsewhere in sub-Saharan Africa and various large-scale projects and

programmes in South Africa indicates the equal importance of the process by which this success was achieved. A strategy is required to establish a national employment creation programme for the construction of public works; the process results not only in greater employment but also in the generation of individual skills and institutional capacities. The strategy includes the following:

- The adoption of a long-term national perspective in which a programme is developed.
- The identification of the type of work which could incorporate greater use of local resources, in particular unskilled labour, and potential clerks, supervisors, technicians and administrators. The analysis of the extent to which local resources could be used within the types of work identified above (detailed technical assessment).
- Detailed attention to the other factors enumerated in the above 'Reasons for success': institutional, organisational, socio-economic.
- The need for a 'programme' (not 'project') approach, which can be succinctly described in the following four phases:

  Phase One Orientation: consensus of all parties concerning type of project, method of construction and conditions of employment;

  Phase Two Preparatory Work: analysis and planning;

  Phase Three Pilot/Initial Training: pilot/demonstration project incorporating an embryonic training programme;

  Phase Four Expanded Training/National Programme: expansion of pilot project and training programme into a regional or national programme: expansion should only take place at the rate at which trained people (site,

multi-site and national levels) can be produced from a programme; the local institutions can productively absorb the trained personnel; and the national institution is able to absorb and manage the trained management personnel and maintain its overall role vis-a-vis policy, funding, planning, organisation, training, co-ordination, monitoring and evaluation.

The above strategy will ensure the requisite institution building at community, regional and national levels. Through these phases the institution will grow itself (human resources and systems). In order to achieve the above, considerable attention must be paid to the education of all concerned in the principles and process of employment-intensive construction.

The potential for a significant increase in employment generation per unit of expenditure is not automatically released by the intention to use employment-intensive methods on large-scale operations. Large-scale operations require establishment through policy, institution, organisation, training and programme development. The above approach has to be located within an institutional framework: national, regional, local. "Lead-in" time is necessary. The World Bank has recommended that where no previous experience exists a start-up period of at least three years should be considered.[11] During this lead-in period phases 1 and 2 are carried out within the strategic approach outlined.

Through the 'programme' approach (as opposed to 'project') the institution is established together with the human resources required to implement the work from site level through to national planning and co-ordination. This process means that overheads are high during Phases One to Three. However, once the preparatory work has been done and the institution established overheads revert to more normal ratios. In Kenya,

for example, the ratio of overheads to direct construction was 84:16 during the first three years (1974-76) but 16:84 over the whole period 1974-1985. Expenditure on training accounted for 1-2% of programme costs.

The four-phased approach, outlined above, is the result of many years of experience and analysis. This approach will mean that the considerable sums of money which have been allocated by government over the past ten years to so-called labour-intensive work will have a developmental impact as opposed to being emergency relief.

By 1992 it was concluded that further expansion of employment creation in public works was limited by the lack of a long-term perspective, national planning and institutional development. From 1992 to 1994 there were some positive developments in this direction.

2.5 Towards a National Public Works Programme

During 1992 a widely representative National Consultative Forum on Drought (later the National Rural Development Forum) was initiated. The Forum decided to set up four Task Forces, one of which was the Employment Task Force. In turn this task force explored short-term and long-term options. In relation to the long-term it made recommendations as to the pre-investment work that needed to be carried out for a National Employment Creation Programme using Labour-intensive methods for the Construction and Maintenance of Public Infrastructure (water supply, sewerage, roads, stormwater drainage, erosion control, irrigation, electricity supply and other physical infrastructure).[12] An intrinsic part of this proposal was the development of individual and institutional capacity (community, local, regional and national): extensive training was envisaged. While the full benefits of such work would be revealed in a long-term

programme, the short term was not ignored. The pre-investment work for this programme was taken forward by the National Economic Forum (NEF). Under the auspices of its Technical Committee (NEFTC) a pre-investment study was carried out.[13] On the 19 June 1994 the results of the NEF study were accepted by the Cabinet of the Government of National Unity as the basis of the National Public Works Programme (NPWP). The NPWP would not be a 'tack-on' programme: it would cover all public expenditure on infrastructure for which it is feasible to use labour-intensive techniques. In essence the NWP consists of a process of labour-intensification and increased training and capacity building in the provision of infrastructure. The NPWP became a key component of the government's Reconstruction and Development Programme (RDP).

A second initiative was championed by the National Committee for Labour-intensive Construction (NCLIC) and COSATU. Early in 1992 a member of the South African Federation of Civil Engineering Contractors (SAFCEC) realized that greater use of labour-intensive methods of construction could alleviate unemployment and bring more work into an industry that had been crippled by recession, cutback in government spending and civil war. Representatives of several civil engineering industry associations (SAFCEC, South African Institution of Civil Engineers, South African Association of Consulting Engineers, South African Road Federation) met and decided to convene a symposium on labour- intensive construction. The author was invited to take part in preparatory meetings and present a paper 'Setting the Scene', and advised that if the group were intending to take the subject seriously they should invite COSATU to take part in the symposium. This led to a series of meetings between NCLIC (which by this time included the Institute of Municipal Engineers in South Africa) and COSATU. In part this has led to the Executive Director of SAFCEC defining the industry as labour-

intensive. More importantly this led to the drafting of a Framework Agreement. The Framework Agreement consisted of over 40 items. While each is important, in the first item the industry committed itself:

> 1.1 To maximize the use of labour intensive systems of construction within public works programmes, with due regard to economics.[14]

In turn COSATU agreed to the linking of payment to production in public works. Both of these commitments were made within the context of community involvement in the definition of what has to be constructed, where, and in the construction process itself (not just employment creation but also skills: i.e. as much emphasis upon process as product). Training is an intrinsic part of the Agreement. The Framework Agreement between NCLIC, COSATU *and* the South African National Civics Organization (SANCO) was signed on 22 June 1993. Shortly thereafter a National Coordinating Committee (NCC) was been formed, an Accreditation Board for Labour-intensive Construction (ABLIC) established, pilot projects initiated and a monitoring and evaluation process set in motion. The co-operation between the public sector, privately owned companies, the Trades Unions and civic organizations is interesting and unusual to say the least.

At the same time, prior to the 1994 election the ANC's proposed Reconstruction and Development Programme (RDP) was the result of several years of careful deliberation and widespread participation. One of the main thrusts of the RDP was to link reconstruction and development through an 'infrastructural programme'. The key area where special measures to create jobs could link to building the economy and meeting basic needs would be in redressing apartheid-created infrastructural disparities. It was stated that there 'must be a co-ordinated national public works programme to

provide much needed infrastructure'. One of the qualifying statements reads 'co-ordinate with and link to other job creation and labour-intensive construction initiatives'.[15]

Are these not fundamental components of the long-term programme advocated by the Employment Task Force? Is this not the same as the long-term programme? Yes and No. All aspects of the Framework Agreement would be either critical or useful for the long-term programme. But the industry is currently equipment-intensive. Despite its assertion 'to maximize the use of labour-intensive systems of construction ...'it cannot restructure itself overnight. This is explicitly acknowledged in the first item of the Framework Agreement by reference to '...with due regard to economics', supplemented by the examples provided by the industry to support this position which indicated that it had yet to appreciate the extent to which equipment could be replaced by labour.

However, it is considered that, for example, in road construction the Framework Agreement could lead to the proportion of cost going to labour increasing from 10% to 15% in the short term. For example, in relation to the N1 motorway between Johannesburg and Pretoria there were two options: 6% or 15% to labour. At that time the 6% option was chosen. The fact that there was a 15% option shows that within **existing** civil engineering practice it would be possible to generate employment opportunities. This was during the 1970's before the concept of labour-intensive construction had any weight in South Africa. The author considers the Framework Agreement could lead to such developments. While not to be sneered at, it pales by comparison to the proportion of total construction cost that could be achieved by labour-intensive methods (60%-70%).* Nevertheless the author considers the language of the

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* See Footnote on page 3.

Framework Agreement is sound and as such this initiative would be an ally of the long-term programme: together with other sensible and organized short-term work it would form part of the lead-in phase thus creating some employment and public works, and responding to social needs and political demands.

During 1995 the three initiatives were fused. The concepts embodied in the work of the Employment Task Force provided the intellectual framework for the NPWP. Originally formulated by industry and construction COSATU, the Framework Agreement's term of validity expired in June 1994. The process for re-negotiating the Framework Agreement was expanded to include the now legitimate government.

3. NATIONAL PUBLIC WORKS PROGRAMME

3.1 NPWP: A description of its original objectives, key principles, strategic thrusts and proposed means of implementation

In August 1994[16] the South African Government of National Unity launched a National Public Works Programme (NPWP)*. It was based on the proposals generated through a widely participatory detailed study by the National Economic Forum during the first half of 1994, which in turn had grown out of deliberations carried out by the Employment Task Force of the National Consultative Forum on Drought/National Rural Development Forum[17] and incorporated into the Reconstruction and Development Programme. Responsibility for the NPWP was located within the National Department of Public Works.

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* The full title was printed on all the official documentation National Employment Creation Programme Using Labour-intensive Methods for the Construction and Maintenance of Public Infrastructure: National Public Works Programme (NPWP).

The main objectives of the NPWP[18] were to:

- Reduce unemployment through the creation of productive labour-absorbing jobs and opportunities for local contractors, through labour-intensive approaches, avoiding the creation of dependence and indigence commonly association with anti-poverty welfare programmes
- Educate and train those on the programme as a means of economic empowerment
- Create, rehabilitate and maintain physical assets (such as clinics, schools, creches and roads) which serve to meet the basic needs of poor communities and promote broader economic activity
- Build the capacity of communities to manage their own affairs, strengthen the local government and other institutions and generate sustainable economic development.

Key principles of the NPWP

Thirteen key principles were defined to guide the implementation of the NPWP:[19] constitutional context; role of government; partnership; decentralization and delegation; targeted approach; community empowerment; labour-intensity; sustainability; labour standards and wages; training and capacity building; efficiency and accountability; promotion of affirmative action; limited life. Five of these were singled out for more detailed delineation: labour-intensity; community empowerment; education and training; sustainability and planning; and monitoring and evaluation. The section on labour-intensity read as follows:

Labour intensity

> *Labour-intensive construction means the use of labour rather than machines, where technically and economically feasible. If it is not technically or economically feasible to use labour for a certain activity, machines should be used.*

The construction of many types of infrastructure has become highly mechanized in South Africa since the 1950's. In other words, people have been replaced by machines. The skills that used to be involved in labour-intensive construction have now been largely lost. These skills need to be re-learnt if we are going to use people again. The relearning of these skills, and improvement of them, requires training and capacity building.

Labour-intensive construction does not mean having a few more labourers on site while carrying on doing the work using machines. Instead it involves changing the design of infrastructure so that labour is used instead of machines wherever economically and technically feasible.

There are both good economic and social reasons for moving to labour-intensive construction. South Africa has abundant labour, mostly unskilled and unemployed. From an economic point of view, this means labour-intensive methods could be as efficient as machines in many activities, particularly in the construction sector.

The creation of large scale jobs for the unemployed will in turn enhance skill levels in the society. This will also contribute to economic growth and development.

In some cases, the necessary technical knowledge does not yet exist and needs to be built up through technical research and development. Similarly, in some cases the necessary training material does not yet exist, and needs to be developed.

Table 1 shows the potential in labour content in the various sectors.

The NPWP should only expand (i.e. labour-intensive construction of infrastructure which is conventionally constructed machine-intensively should only expand) at the rate at which the required trained capacity to obtain good quality and cost-effective products becomes available.

Labour, rather than machines, can be used for many construction activities such as excavation, loading and spreading soil and gravel. It is not technically feasible to use labour for some construction activities, such as compaction of gravel to high densities.

On projects, such as earth dams and gravel roads, it is possible to use labour-intensive techniques for most of the construction activities, resulting in a very high labour content of construction costs.

However, for other projects, such as highways, it is not technically feasible to use labour-intensive techniques for as many development construction activities, and the labour content of the construction costs will not be as high.

Thus, labour-intensive techniques can be used for some construction activities both in large and complex projects and small and simple projects. The use of labour rather than machines - for the appropriate construction activities - can be specified in contract documents.

TABLE 1: SPENDING ON TARGETED LABOUR AS PERCENTAGE OF SPENDING ON LABOUR, PLANT, AND MATERIALS

SECTOR	CURRENT SPENDING	POSSIBLE SPENDING
Simple projects	60% - 80%	60% - 80%
Low cost housing	25% - 35%	30% - 40%
Social buildings	20% - 30%	25% - 35%
Water reticulation	5% - 15%	25% - 35%
Stormwater	5% - 15%	40% - 50%
Sanitation	5% - 15%	25% - 35%
Roads	5% - 15%	30% - 80%
Dams	10% - 20%	50% - 80%
Railways	5% - 15%	30% - 30%
Forestry	25% - 35%	35% - 45%
Electrification	10% - 15%	12% - 17%
Small-scale agriculture-related infrastructure	40% - 80%	40% - 80%

Two Strategic Thrusts Identified for the Implementation of the NPWP

The key function of the NPWP is to ensure that the infrastructural provision of the state is carried out in a way which also maximises productive employment, training and capacity building, and community empowerment.

There were two strategic thrusts:

A programme to re-orient public expenditure on infrastructure and transform the institutional capacity of the functions of national, provincial and local government to ensure longer scale job creation, skills development and capacity building in forthcoming years.

A community-based public works programme to ensure short-term funding to a variety of government and non-government organisations provided they meet the criteria

consistent with the objectives of the NPWP. This would ensure short-term delivery, particularly in rural areas where there is a lack of institutional capacity. This fund would focus in creating employment and alleviating poverty in the short-term, while the capacity is built to deliver jobs in a cost effective manner through normal expenditure on infrastructural projects.[20]

In essence they comprised:

1. A programme to re-orient public expenditure;
2. The CBPWP.

Community-based Public Works Programme (CBPWP)[21]

The second strategic thrust was the CBPWP. Its objectives were:

(i) Short-term delivery: to assist the Government of National Unity in urgent provision of employment opportunities and infrastructure, particularly in the rural areas where there is a lack of institutional capacity and great need.

(ii) Target the most needy, especially rural women and youth.

(iii) Kick start the NPWP by building capacity at provincial and local levels.

(iv) Demonstrate to government departments and the private sector how sustainable infrastructure can be delivered with the aid of involvement of communities, without large-scale use of machinery and without sacrificing standards.

From the RDP fund a sum of R250 million was allocated to the CBPWP for community-driven infrastructural projects which could be implemented within a low level of institutional capacity (and individual skills).

Implementation

The CBPWP was implemented in two ways, namely by the Provincial Departments of the National Department of Public Works and Non-Governmental Organisations (NGO's), especially those with a proven capacity to distribute funds. In order to receive CBPWP funds projects were supposed to meet the following criteria:

- Labour-intensive methods must be used.
- There must be strong community participation in all aspects of the project, from conception to design, implementation and monitoring.
- Provision must be made for the maintenance and management of the asset once it is completed.
- Assets created must be needed by communities to improve their welfare.
- Training and capacity building must be provided to participants.
- The applicant must be able to demonstrate that it has the capacity to implement the project at the quality specified.

In 1995/6 the Provincial Departments of the Public Works Department were allocated R150 million and Non-Governmental Organisations R100 million.

3.2 Interim Results and Discussion

General

To date what have been the results of the NPWP? Because of the complexity of the NPWP there is no simple (single) answer to this question. The answers depend upon the vantage point and the emphasis laid upon each of the various objectives stated in the original document.

Given the origins of the programmes and the overriding importance of employment creation, it is reasonable to focus initially upon its first objective: reduce unemployment. Thereafter the effectiveness of its two strategic thrusts will be discussed.

Reduce unemployment

Proper evaluation requires criteria and data. No target was set in the original NPWP documentation. In 1991 a cursory analysis of public sector expenditure had indicated that at least 100 000 additional productive employment opportunities could be generated. In 1994 this was refined. Partly based on Table 1, for each sub-sector of civil engineering and building, estimates were made of the increase, over five years, of the proportion of people employed per billion of expenditure.[22] For example current employment generation for the conventional construction of roads, sanitation and dams is about 14 000 per billion for both roads and dams and 21 000 for dams. Over a five year period employment-intensive methods would result in 70 000 for roads and dams and 40 000 for sanitation: these represent increases of 500%, 333% and 285% respectively, without compromising time, cost or quality. In 1995 the Public Works Department estimated that employment could be generated by the programme. In 1996 this figure was reiterated, there would be an increase of 100 000 jobs through 'accelerated labour-based infrastructure development and maintenance of public works in urban and rural areas'.[23]

Turning from estimates of potential to results in the macro-economy. In 1995 the civil engineering industry employed 64 424 people at R6,02 billion turnover; in 1998 it employed 75 387 people at R9,18 billion turnover (at current prices; the 1998 figures are still provisional).[24] There has, therefore, been no noticeable effect on the mainstream industry. The NPWP has certainly not yet generated work for an additional 100 000 people

within the formal civil engineering industry. During 1998, 80% of the funding for civil engineering came from the public sector.[25] Policies are in place and the public purse is providing the money but to date the NPWP has not yet resulted in a significant increase in employment per unit of expenditure within the formal/conventional construction sector.

Capacity Development

This is a subject for a separate paper - the results of an official PWD study by Mr Croswell and myself have indicated what needs to be done in future with regard to identification, appraisal, design, documentation, training.[26]

Re-orientation of Public Expenditure

To what extent has re-orientation and transformation occurred and has it resulted in ensuring 'larger-scale job creation, skills development and capacity building'? As yet there has been no impact upon employment generation. What of the others?

In Section 2 it was shown that between 1992 and 1994 a Framework Agreement had been developed through extensive collaboration between industry, organised labour and community (local government to be). After the elections government formally became part of the process; many of those previously from organised labour and the community now wore new hats - however there was a significant dispersal of many of the central players to other more nationally important roles, e.g. Alec Erwin (Minister of Trade), Jay Naidoo (Minister responsible for the RDP). At the time the signs were propitious.

Small Contractor Development

Despite the existence of a document which had resulted from extensive consultation, for reasons yet to be unearthed, the Department of Public Works embarked upon a vigorous programme of changing contract documentation and tendering processes to increase opportunities for small contractors (or in the parlance of the day: 'previously disadvantaged').[27] To the best of my knowledge, it was initiated without much consultation with the various stakeholders and is bolstered mainly by the belief that the superior efficacy of the free-market supplemented by the opinion that small contractors generate more employment than large ones - (watch this space - the demand for equipment subsidy will soon be here). Some briefing sessions were held after production of the first batch of documentation. For about two years it was termed Affirmative Procurement Policy, now it has become Targeted Procurement. Although the preambles and introductory material state that job creation and labour-based methods are part of the rationale, this quickly fades from sight.

What has been the result? As yet, no noticeable effect on overall employment generation and no published data upon the number of small contractors. There is a body which represents these small contractors (formerly NABCAT now CIC), their links with SAFCEC continue to get closer.

The NPWP's Integrated Training Report (First - and last - draft 14/12/95)[28] estimated that for the period 1997/8 to 2000/1 between 342 and 618 small contractors would be required to carry out the work which would be available. To date no information has been made available as to the number of independent small contractors now operating. No data by which to judge reality against projection (another example of 'lack of data collecting culture'). Emphasis upon small contractors distracts from attention to the organisations

which are responsible for the vast majority of implementation. Further, little attention has been paid to international experience which indicates that 75% of small businesses fail (therefore the need for a programme of development). Finally, an analysis[29] of major expenditure during 1998 shows that 79 per cent of contract expenditure is for contracts above R3 million (which can only be carried out by the large contractors) while contracts for less than R3 million account for less than 21% of the total value.* The emphasis upon small contractors does not appear to have heard of Turin, Drewer, Wells or Groak.

Institutional and Organisational Aspects

The National Department of Public Works was given responsibility for the NPWP (later, also for the transformation of the construction industry). However, it was often stated that the NPWP did not belong in any one line function department (NPWP, 1995b:22). Rather, it affected all government departments responsible for public spending on construction. The key national, provincial and local departments who had a role in implementation included the following Departments: Public Works, Transport, Water Affairs, Housing, Education and Training, Health, and Constitutional Development and Provincial Affairs (the latter was charged with the task of implementing the R800 million 'Municipal Infrastructure Programme').

While the PWD was responsible it may be seen that there were a considerable number of role players involved. Several factors exacerbated the potential for confusion. Although termed the 'Public Works Department', historically it had become the 'State's landlord'

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* The same analysis revealed that 79% of the total contract expenditure was carried out by about 20% of the number of contracts; while 21% of the total contract expenditure was carried out by 80% of the number of contracts.

mainly responsible for the leasing, maintenance and construction of public *buildings* (not works/infrastructure). Responsibility for construction and maintenance of major physical infrastructure (works) generally lay with the 'line' Department of Transport and Water Affairs (and their regional, provincial, local equivalents). There was some resistance from other departments - with their own hierarchies and procedures - to implement projects in accordance with principles laid down by another department. Particularly one that had been concerned with property as opposed to construction. The institutional difficulties which beset the NPWP were compounded by restructuring at provincial levels. In the Northern Province, for example, four apartheid structures have been in the process of amalgamation since 1994. As the NPWP Task Team reported less interdepartmental work was being done at provincial level due to the enormous re-organization with which most provinces had (and have) to deal. And, until recently there were no legitimate local authorities and thus no local institutions for funding, planning and implementation.

3.3 NPWP Assessments

Some comments have been made above under 'General'.

A few pertinent quotes from *Government's '98 Report to the Nation*[30] succinctly summarise the Department of Public Works own assessment of the NPWP.

Transformation

Public Works has transformed itself from its traditional functions as the "State's landlord" to include the promotion of development as part of its contribution to Government's socio-economic objectives.

Its core functions have been redefined to promote efficient delivery of services to Government and society as a whole.

The National Public Works Programme incorporated as a core function, has a section that develops policy, helps transform the construction sector and works with the Community-based Public Works Programme. Project management has become a core function and most of the traditional construction work is outsourced to the private sector. In 1997, coordination of government infrastructure delivery previously an area of critical weakness, was made a Public Works responsibility. The strategic role of the Department into the next century is outlined in a 1997 White Paper. A Green Paper develops a strategy to promote stability in the construction industry, foster growth and international competitiveness, while generating new capacity and addressing imbalances.

The explicit need to create employment opportunities was not mentioned.

3.4 Interim Results of the CBPWP

Provincial Department of the Public Works Department

The R150 million was shared amongst the nine provinces according to four criteria: level of unemployment, level of poverty, the need for skills, and the need for infrastructure. The poorest three (Kwazulu-Natal; Eastern Cape and Northern Province) received 65% of the funding.

Assessment[31] of the R150 million allocated to the Provincial Departments of the PWD revealed the following:

- The bulk of the funding was spent on 'shelf' projects, i.e. previously identified projects which had already been designed and specified. These projects had not been conceived from an employment generation perspective. Therefore there was an incompatibility between the criteria for the CBPWP and realisation of potential during implementation

particularly with regard to choice of project, labour-intensity, and a high degree of community involvement.

- Similarly, given the demand for rapid delivery little coherent training, technical development and capacity building was carried out in relation to the objectives.
- There were wide disparities in wage rates and conditions of employment exacerbated by official NPWP documentation stating: "labour standards will be as closely aligned with those in the formal sector as possible" (NPWP 1995b:7).
- In the NPWP documentation it was envisaged that "in order for lessons to be learnt and for the programme to improve with time, it is essential that mechanisms for monitoring and evaluation are put in place" (NPWP, 1995b:13). Again due to the pressure of rapid delivery, monitoring and evaluation systems were not established prior to implementation. Subsequent evaluations have revealed that appropriate data needs to be identified, then recorded and reported.
- As for the NPWP as a whole, there were institutional difficulties within the PWD and its Provincial Departments and between other institutions such as those responsible for Water affairs, Transport, Land, Constitutional and Housing.
- Lack of understanding of the role of the CBPWP in relation to the NPWP, in particular its role as a pilot programme for the NPWP. With respect to the NPWP it was envisaged that the "... programme could last over ten years" (NPWP, 1995b:7). However, the lifespan of the CBPWP was not spelt out clearly. In its first year it was expected to develop the capacity of the provinces to implement development projects. By reference to relevant experience elsewhere and reality in South Africa this was not a realistic time frame.

Most of these shortcomings were the result of demand for rapid delivery. As seen above in the Green and White Papers the Department remains committed to the CBPWP objectives. Some important lessons have been learnt which the Department is attempting to incorporate into its future programme.

Non-Governmental Organisations

By contrast to the provinces, allocation to the NGO's was not transparent. Certain institutions would not usually be seen as community-based. Secondly, the allocation of NPWP funding was not made public until R70 million (70% of the NGO funding) had been allocated to the Independent Development Trust's Community Employment Programme (IDT:CEP). R12 million was allocated to the Siyakha Sugar Development Programme, R8,9 million to the Youth Supported Projects and R4 million to the Transkei Community School Building Trust*. This section will only discuss the IDT's CEP.

Assessments of the efficacy of the CEP vary. However, first, as for the Provincial CBPWP most of the projects funded were already at advanced stages. The PWD needed rapid delivery and this was the main determinant of the projects chosen, not the NPWP criteria.

Initial IDT assessments of its own CEP were reasonably bullish. It claimed to have established local capacity to implement employment creation in projects. Other early assessments were more critical: the creation of local institutional capacity has been challenged; the quality of assets questioned.

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* It was stated that the PWD wanted to give money to NGOs that were capable of running the programme countrywide, i.e. institutions with the capacity and experience to manage and distribute funds. The institutions mentioned lacked a national character and/or proven experience.

A Quality of Assets investigation was initiated,[32] by the NPWP Task Team, in response to reports of quality problems. The investigation aimed to:

- study a selection of CEP projects in order to verify the reports of quality problems;
- try to define minimum 'technical standards';
- identify causes of quality problems and identify reasons for successes;
- make recommendations for action to limit quality problems in future CBPWP projects.

The study teams visited 55 projects in 7 (out of 9) provinces during May and June 1995. The total value of the projects was R10,5 million (15% of the R70 million total). The authors admit that the study had limitations particularly with regard to selection of projects, time allocated for investigation, and method of collecting data. Nonetheless the following conclusions were reached:

Projects (%)	Quality Problems
36	None
24	Minor
31	Significant
9	Serious

In addition 35% had levels of service problems; 25% labour-intensive problems and 7% prioritisation problems.

An example of a labour-intensive construction problem was the case where the task rate was R15 per 0,4 m^3 excavation in trenches. Workers were achieving eight tasks per day and earning R120 per day. This indicates the ignorance of the technical facilitation. It also compromises the CBPWP goal of targeting the poor and sets a bad example to government departments with regard to cost-effectiveness of labour-intensive methods: 'Some engineers have insufficient knowledge of appropriate technology and labour-intensive construction'.

A similar remark was made about facilitations. In relation to funding constraints, the study team concluded that there appeared to be a contradiction between the NPWP's goal of cost-effective production of good quality assets and once-off allocation; good quality, cost-effective assets required longer term capacity building of programme manager and facilitation, which in turn requires longer term funding. They recommended that the NPWP should consider longer term funding commitments to NGO's rather than once-off allocations of funds.

As to the objectives of the CEP and CBPWP, the study team observed that, on some projects, the CEP facilitation teams have had problems translating CEP and CBPWP objectives into good practice. For example, the objective of community control and empowerment had been interpreted on some projects as giving the people what they want, even if its is an inappropriate level of service. The study team recommended:

- CEP project funding criteria should be reviewed to ensure that they adequately reflect the CBPWP goals of cost-effectiveness of construction methods;
- The CEP and NPWP should hold workshops with facilitations to go through practical case studies to illustrate translation of objectives with good practice.

As mentioned above, the study team remarked upon the limitations of the once-off allocations and the short time horizon. It could have made more of the need to link the labour-intensive construction of good quality assets with long term programmes. Technical sophistication (which *includes* labour-intensive construction given the equipment based nature of the industry) is not compatible with short term fast tracking in the CBPWP context. The type of project is of particular importance.

In June 1996 the Labour Commission Report stated:

> The Commission would have wished to support a stronger recommendation that the scale of the Community-based Public Works Programme (CBPWP) would be increased significantly. However, the Commission cannot recommend an increased commitment to the CBPWP until credible monitoring and evaluation information from the CBPWP convincingly shows that the CBPWP is creating jobs and skills by delivering infrastructure through processes that are both community-driven and cost-effective.[33]

By contrast a roughly contemporaneous review by the Community Agency for Social Enquiry (CASE),[34] South Africa has probably one of the best Public Works Programmes anywhere. In terms of technical design standards and the quality of the completed physical infrastructure, the CBPWP surpasses anything that the ILO team members had encountered in more than 30 developing countries in Africa, Asia and the Pacific. Not only this, but the level of professional integrity among most of the role players in the CBPWP was, in international terms, outstanding. Nevertheless, they reported that the CBPWP had had its fair share of problems.

Why are there such differences in assessment? Partly, the CASE study paid a great deal of attention to community empowerment, whereas the Labour Commission (which had invited another ILO team* to contribute to its work) was concerned by the lack of robust data regarding employment (the Community *Employment* Programme could not say how many people had been employed).

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* This team consisted of tenured ILO officials. The CASE study also used short term expatriate consultants for ILO/CASE.

The Department's own assessment of the CBPWP may be found in the Government's 1998 Report to the Nation. Unlike the NPWP, which has been 'incorporated as a core function' into the Department and 'works *with* the Community-based Public Works Programme',* the CBPWP merited its own titled sub-section.

Community-based Public Works Programme

Public Works programmes contribute to poverty alleviation, job creation and infrastructure development. The Community-based Public Works Programme, targeted mainly at rural communities, was allocated R85 million for poverty relief during 1997: This was used mainly in the provinces most affected by poverty, namely Kwazulu-Natal, Eastern Cape and the Northern Province.

So far, more than a thousand projects have been funded to provide sanitation, road building, water provision, environmental protection, clinics, crêches, schools and community halls.

The programme, which has created over 140 000 jobs, 19 000 of them sustainable, has been redefined to meet new challenges.[35]

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* Initially, the CBPWP was a strategic thrust *of* the NPWP.

4. CONCLUSIONS

Specific

One of the strategic thrusts of the NPWP was to change the rules so as to generate significantly more employment per unit of expenditure on public infrastructure. The other was the CBPWP: community-driven projects using labour-intensive methods were to result in good quality, cost-effective assets.

A positive result of the NPWP is that it has been incorporated as a core function into the Department of Public Works. This is important from the perspective of the importance of policy and the establishment of a framework for future progress. However, the NPWP has yet to result in a significant increase in employment generated per unit of expenditure within mainstream expenditure on public infrastructure (i.e. where most of public expenditure occurs). Has the concentration upon Affirmative (now Targeted) Procurement been justified? Not yet.

Differing assessments of the CBPWP have been reported. Unlike the NPWP, it was considered worthy of its own titled sub-section in the *Government's '98 Report to the Nation*; and 'was allocated R85 million for poverty relief during 1997', The PWD is certainly making serious efforts to rectify any problems in the CBPWP. But, from experience elsewhere and in South Africa, the author concluded above that a proper employment creation programme should not be categorised as 'relief': quality, cost, time and sustainability become the victims of such an approach. Furthermore, R85 million represents only about 2% of current expenditure on civil engineering and less than 1% of expenditure on construction as a whole (civil; building; and materials). Thus, too much concern with the minutiae of the CBPWP distracts attention from where major expenditure is taking place.

General

In conclusion there are several general implications for South Africa of labour-intensive work throughout Africa (i.e. including South Africa).

Specifically: Rural roads may be constructed and maintained by highly labour-intensive means: 5 to 7 times more employment being created per unit of expenditure. It is also possible to create a significant increase in employment opportunities per unit of expenditure across a wide range of civil construction including most municipal or urban engineering services and using contractors. Research at this university indicates that there is a high employment potential in the construction of high standard infrastructure. Developments in South Africa have shown that good quality, cost-effective and timely construction can be achieved for a range of work far greater than low-volume, low-cost rural roads. Equally, that contractors could play a role in the execution of the work provided that the preparatory work had been done: planning, designs, specifications, contract documentation, tendering and training of personnel. But the existing structure of the industry cannot be ignored.

Research revealed that the majority of the so-called labour-intensive work had been either conventional or labour-*ex*tensive: conventional construction does not produce additional employment per unit of expenditure; labour-*ex*tensive work is the employment of a large number of people to produce products of doubtful value without much concern for time and cost (these projects reinforce the prejudice of those who cannot conceive of effective labour-intensive work).

The national programmes of rural road construction indicate how to establish a national employment creation programme for the construction of public works: the process resulting not only in greater employment but also in the generation of individual and community

capacities in technical and institutional terms. National programmes have been established through:

- the adoption of a long-term national perspective in which a programme is developed;
- attention to technical, institutional, administrative, organisational and socio-economic detail during the preparatory lead-in phase and throughout the programme;
- institution building at community, regional and national levels;
- balance between centralisation and decentralisation;
- extensive training at site, multi-site and national levels.

And a corollary: these programmes were *not* treated as emergency relief.

Although it has a proven track record that does not mean that it will be adopted in South Africa. The World Bank has recommended that where no previous experience exists a start-up period of at least three years should be considered. But in the present political climate even policy makers who are sympathetic towards labour-intensive construction face demand for delivery and thus the difficulty of allowing for a lead-in period. Concentration on relief or 'jobs' detracts even further from the need for a start-up period. There is also no doubt that many decision-makers reject employment-intensive methods because they view them as 'backward', 'primitive' and carry the innuendo of 'slave-labour'. It is still recommended that the dilemma be resolved through (i) reviving the concept of a long-term employment creation programme and (ii) at the same time taking advantage of the Framework Agreement. I remain sceptical regarding the compatibility between employment generation in the provision of physical infrastructure if it is done within a relief/emergency context. However, there are bound to be relief/emergency/fast track/disaster initiatives. The challenge will be to apply the lessons learned from employment creation programmes to disaster/relief initiatives: guidelines have been published regarding a sensible approach to

short-term time frames.[36] In this way the process of employment-intensive construction could indeed make a contribution to alleviating unemployment and generating individual and community skills in technical and institutional terms. The four-phased approach outlined above is the result of many years of experience and analysis. Adoption of this approach would mean that the considerable amounts of money that have been allocated by government over the past ten years or so, to so called labour-intensive work would in future have a developmental impact as opposed to just providing emergency relief. At least where the expenditure of public money is concerned - and in South Africa, 80 per cent of the funding for civil engineering *is* public money - to take the opportunity, provided by construction of public works, for people to be part of production.

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In addition I would like to thank Mrs P E King for her patience and assistance in the preparation of this document.

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'2.3.5...The key area where special measures to create jobs can link to building the economy and meeting basic needs is in redressing apartheid-created infrastructural disparities. There must be a co-ordinated national public works programme to provide much needed infrastructure, to repair environmental damage, and to link back into, and expand and contribute to the restructuring of the industrial and agricultural base.'

The RDP White Paper also refers to the NPWP:

'3.11.2... The NPWP, using labour-intensive methods of delivery, training and socially determined wages, will increase employment associated with the creation and upgrading of infrastructure.'

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Appendix A Criteria for Provincial NPWP teams 2pp

B Training Programme 3pp

C Proposed indicatory framework of allocations to provinces 5pp

D Project Application Form 4pp

E Project Submission Form 4pp

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