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# **Developing a Systems Analytical Framework for the National Poverty Alleviation System (NPAS): The Community Based Public Works Programme (CBPWP) Case Study**

Mwansa Saidi

## **ABSTRACT**

Poverty affects large numbers of people in South Africa, according to the 2002 Human Development Report, 35.8% of the population lives under the \$ 2 per day poverty line. In Addition, the country is ranked at 111 out 175 countries in terms of poor social indicators on Human Development. CSIR undertook a project to use systems methodologies and apply them towards a better understanding of the 'assumed' NPAS aiming: at establishing a suitable framework for analysis; describe and analyse the system in such a way that stakeholders and decision makers can engage towards a more effective poverty alleviation system. The CBPWP mechanism designed and implemented with the poverty alleviation objective is used as a case study to test the framework development. The framework begins to indicate potential contributions to a comprehensive understanding and design of other infrastructure interventions with poverty alleviation objectives. It also enables the refinement of the framework.

## **KEYWORDS**

**Poverty Alleviation; Systems engineering; Systems thinking; Soft systems methodologies; Community based**

## 1.1 INTRODUCTION

Poverty affects a large number of people in South African. According to the 2002 Human Development Report 35.8% of the population lives under the \$ 2 per day poverty line. In addition, South Africa is ranked at 111 out 175 countries in terms of poor social indicators on Human Development. CSIR undertook a project to use systems methodologies and apply them towards a better understanding of the NPAS. This was with the aims of: establishing a suitable framework for analysis; and to describe and analyse the system in such a way that stakeholders and decision makers can engage towards a more effective poverty alleviation system. It was assumed that such a system exists though not intentionally and consciously designed.

The CBPWP was one of the mechanisms that were implemented with the main objective of poverty alleviation by the government (NPWD, PMS Book 1). As a poverty alleviation system, it will be used as a case study to test the NPAS framework that has been developed. The paper is divided into the following sections: the background, methodology, the development of the systems analysis framework, the CBPWP case study, findings, framework of analysis and conclusion.

## 1.2 BACKGROUND

The initial point of departure for the project was to describe and analyse the South African NPAS using Systems Engineering (SE). The basic SE questions were applied around the goals, functions, users, user requirements, role players and interfaces of the system to describe a preliminary system (CSIR, 2005: 16), see Figure 98.1. Workshops with a number of experts in poverty alleviation also added valuable input to the description.

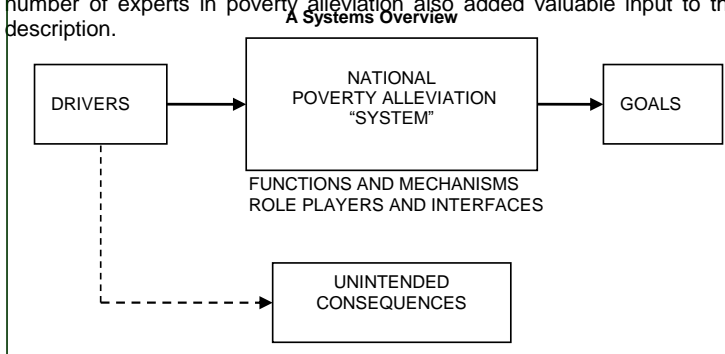


Figure 98.1 Systems Overview

The main characteristics of the NPAS can be summarised as follows (Turpin et al: 2005):

- The NPAS as it exist has just evolved organically
- It is not centrally controlled by any party
- It consists of multiple stakeholders with different goals and views which can be conflicting sometimes
- There are information and communication breakdowns and difficulties between the users and implementers / designers of the system
- It's a mess system addressing interrelated problems
- Boundaries of the system are not well defined and vary based on the perceptions of the stakeholders
- It is highly responsive and adaptable
- Interventions may have long term consequences
- It cannot be measured objectively
- There are ethical implications and it is often not feasible to experiment and build alternative systems

The system as described above depicts characteristics of complex systems as described by Cilliers (1998), and therefore, it is not reducible. It was realised by the project team that while the SE was useful and provided valuable insights to the description it was limited when applied to soft systems like the NPAS. As observed by Clayton and Radcliffe (1996: 186) "A number of problems arise when these hard systems approaches are applied to soft systems, especially those systems that involve humans. The hard systems approach starts with a basic acceptance of objectives, problem specification, and organisational needs. Hard systems engineering aims to provide a solution to a defined problem in the terms of which the problem is posed, so these factors are generally taken as given. With soft systems however, there are frequent disagreements as to what the goals and objectives should be. It is very important to recognize this issue and deal with it,"

It is problematic to define the problem for poverty alleviation and its objectives because of the various view points around poverty alleviation. There are various approaches to poverty alleviation for instance basic needs approach, asset based approach, capabilities approach, sustainable livelihoods approach etc. Clayton and Radcliffe (Ibid) suggest that in such situations "it is important to make that viewpoint explicit, and to then work out the systemic consequences from that point." However, the focus of the study was to develop a framework that can give a comprehensive view of the NPAS and not to define the poverty and related alleviation / reduction strategies. A review of various studies on interactions of the NPAS and the household (CSIR: 2006) indicated that the application of both bottom-up and top-down methodologies to analyse the NPAS would provide a comprehensive view. The guidance of the Sustainable livelihood framework ([www.livelihoods.org](http://www.livelihoods.org), 26 March 2006) would ensure the inclusion of all relevant stakeholders. The system's effectiveness will be measured against its own objectives (top down) as designed by the owners. However, it is also important to assess the perspectives of the users (bottom up) regarding the effectiveness of the system.

### 1.3 METHODOLOGY

The systems analysis framework will be tested on the CBPWP case study based on document analysis and unstructured interviews as methods for collecting data. The questions were developed to be used as a checklist to ensure that all the relevant information is collected. These questions included:

- What was the problem?
- How effective was the system in solving the problem?
- What lessons can be drawn from the study?

For document analysis, evaluation reports commissioned by Department of Public Works and the Close-up Reports by the department were the main sources of data. In addition other written materials on the programme were also consulted. Interviews were held with a few stakeholders who played major roles at national and provincial (Western Cape) levels.

The CBPWP will be analysed using a framework that has been developed under the project. The extent of the programme studied in the Western Cape range from project level to the national level. The stakeholders' and personal perspectives regarding the effectiveness of the system (programme) will be given in the analysis. Reference will be made to the experience of the programme as CBPWP prior to 2004 and CBPWP under the flagship of the EPWP.

### 1.4 DEVELOPMENT OF THE SYSTEMS ANALYSIS FRAMEWORK

With the introduction of the soft systems approaches, the systems analysis framework has undergone a number of changes in its development. Clayton and Radcliffe (1996: 186) indicate that "With soft systems applications, system thinking should be regarded as a contribution to problem-solving, rather than as a goal-directed methodology." The project team sees the resulting framework as a tool that can contribute to a comprehensive understanding of the problem than providing answers to poverty alleviation.

The first design was based upon Courtney's design of a New Paradigm for Decision Support (Courtney, J.F., 2001). It also included inputs from the following systems approaches: Systems Engineering (INCOSE, 2004); the Unified Systems Hypothesis (Hitchins, 1992); the Soft Systems Methodology (Checkland, 1981); and the Multiple Perspectives Approach (Mitroff, and Linstone, 1993).

In the second design, the learning cycle for the Soft Systems Methodology (SSM) (Checkland, 1981) was used to enrich the perspective synthesis phase of the Courtney's framework, which he does not explicate.

Steps 3 to 6 of SSM were added to perspective synthesis phase. This enables the development of alternatives based on alternative perspectives not technologies as in SE. The revised framework is shown below as Figure 98.2.

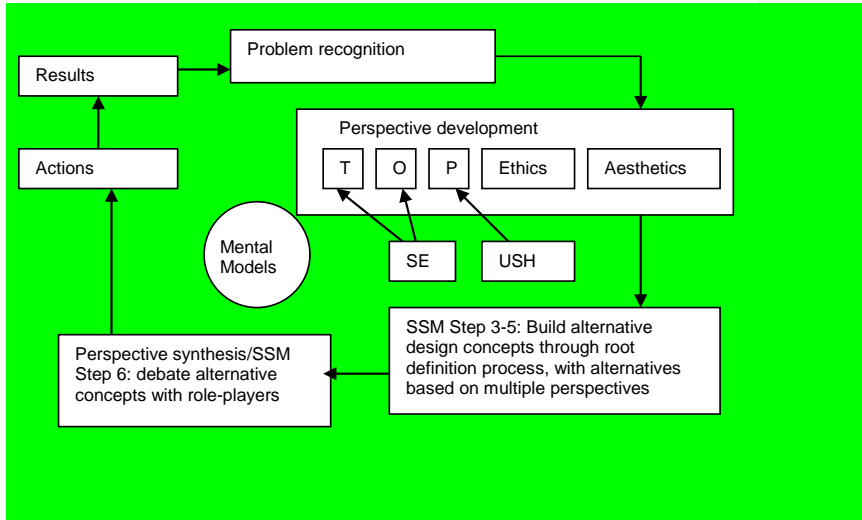


Figure 98.2 A new Decision-Making Paradigm for DSS, modified (Marais and Turpin, 2006)

This is the framework that was applied to the CBPWP case study as a test.

### 1.5 THE COMMUNITY BASED PUBLIC WORKS (CBPWP) CASE STUDY

The Community Based Public Works Programme (CBPWP) was implemented by the National Department of Public Works (NDPW). The NDPW is a government department responsible for the provision and maintenance of all physical assets for the government. The process of accommodation provision is aligned to other departments along the levels of government spheres i.e., the NDPW is responsible for other national departments while the Provincial Department of Public Works (PDPW) is responsible for other provincial departments. NDPW introduced (Mr S Simelane, personal communication, 22 August 2006) poverty alleviation as a function in 1994 but it was riddled with poor coordination which was done in meetings of the Members of the Executive Committee (MEC) and Director Generals (DGs). The management of the poverty alleviation function was according to different projects until the CBPWP was introduced.

At the conceptualisation of the CBPWP, there was high provincial involvement but with the election of local government, it was decided as

appropriate to empower local government through District Municipality.<sup>1</sup> Thus NDPW instituted direct contracts with District municipalities and programme implementers. The provincial government was an overseer of the programme through the provincial line departments such as Provincial Coordinating Committee (PCC). The programme management system was in place to guide the implementation process.

Participatory approach to development in South Africa was developed in the context of previously marginalised and oppressed black majority. South Africa had just become democratic and the new government was aware of the democratic institutions that had developed around them. The ANC government viewed community participation and empowerment as key interventions in developmental activities to nurture the young democracy as declared in the Reconstruction and Development Programme (RDP, 1994: 5): "Development is not about the delivery of goods to a passive citizenry. It is about active involvement and growing empowerment." The presence of an active civil community was seen as an asset for the government to capitalise on. While a national public works programme provided a mechanism to distribute resources; the civil community participation in the creation of the much needed assets contributed to the reduction of poverty, and community capacity building and empowerment.

The CBPWP programme can be divided into three phases: the Presidential Lead Project that spanned from 1994 to 1997; the second phase was the Realignment Phase implemented between 1997 and 1999; and in the third phase, special projects were introduced. The programme was delivered using standard and rapid modes. CBPWP in the Western Cape was part of the third phase. The special projects implemented in the Western Cape amounted to a total budget of approximately 17 million Rand. At the closure of CBPWP in 2004 and the introduction of the Expanded Public Works Programme, the Western Cape maintained the CBPWP unit. The unit has continued to run with an operational budget coming from the overall Department of Transport and Public Works. The branch is also responsible for coordinating the EPWP activities (PGWC, 2006). Current programmes include Saamstaan, Zenzele and Community Access Road Project (CARP).

## 1.6 FINDINGS

Like most countries in the world, the public works programme encompassing the CBPWP was implemented to achieve social development and economic objectives. Thus it was guided by the following principles (NPWD, PMS Book 1: 4): "Creating sustainable job opportunities; targeting of poverty pockets; poverty alleviation; local authority empowerment; and targeting the poorest of the poor primarily in rural areas. It has been observed that (Adato et al, 2005: 21) "Poverty alleviation projects typically have multiple objectives or outcomes valued by

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<sup>1</sup> Mr S Simelane, personal communication, 22 August 2006

the actors involved in the intervention. In the Western Cape, objectives included job creation; the building and rehabilitation of infrastructure, or improvements of the natural environment; the provision of job training that would enable workers to find post-project employment; and capacity building of communities." But McCord (2003) describes these objectives as being 'ambitious' because it is difficult to achieve them under one programme.

There were a number of stakeholders in the implementation of the CBPWP. Stakeholders have been defined as "people whose lives are affected by the programme and people whose decisions can affect the future of the programme." (Greene 1988). Another definition describes stakeholders to be (Patton 1986) "people who have a stake –vested interest-in evaluation findings ... decision-makers and information users who have questions about a programme". It is suggested (Guba and Lincoln 1981) that the selection of stakeholders should be informed by diversity and representativeness. On the CBPWP, Adato et al, (2005) has grouped the stakeholders as financiers, providers and beneficiaries.

However, for the purposes of this study, the following have been identified as stakeholders: National Department of Public Works (NDPW); Treasury; Projects Approval Committee (PAC) an independent committee; Provincial Department of Public Works (PDPW); Provincial Co-coordinating Committee (PCC); Programme Implementing Agents (Pisa); Provincial Programme Managers; and Beneficiaries (Everatt, D. et al. 2002). The beneficiaries include the community members, contractors and service providers. The framework assesses the effectiveness, problems and objectives of the system from the systems design's and stakeholders' perspective (CSIR: 2007).

### 1.6.1 Identified problems

The application of the systems analysis framework to the CBPWP allows the redefinition of the problems characterised by high unemployment, poverty and marginalisation to include considerations of "the backlog in infrastructure such as roads, water and sanitation systems in black rural and urban areas; and the new government's development philosophy that stressed sustainability and democracy." (Adato et al, 2005: 1). Anna McCord (2003) adds that this problem of unemployment and poverty is exacerbated by low demand for low skill and unskilled labour both locally and internationally as a result of a decline in primary sectors of the economy. Unfortunately, South Africa does not offer high opportunities in subsistence agriculture and informal sector employment which have been deployed to assimilate unemployment in other countries. While this perspective of the problem is accepted by the stakeholders involved in the implementation of the CBPWP, the local beneficiaries add that there are also high levels of crime and limited alternative sources of income. The main other sources of income are seasonal farm work; social grants and financial support from other family members or/and friends.

### 1.6.2 Proposed objectives for the system

The stakeholders from the department suggest that the objectives of creating temporary employment, productive assets and sustainable employment associated with the assets should be enhanced and made more holistic. The objectives should be to provide more integrated and sustainable solutions to poverty alleviation as well as addressing the question of providing a few long-term as opposed to a lot of short term employment opportunities. The beneficiaries feel that the objectives of the system should include provision of **permanent** employment and sources of income, provision of basic infrastructure and skills that can enable them to find alternative employment or start their own business. It is also argued (McCord, date) that social support should be provided for the group of the unemployed who cannot access the jobs and other opportunities provided.

### 1.6.3 Effectiveness of the system

Based on the systems objectives, it was successful in terms of targeting the poor. Appropriate infrastructure was delivered during the standard mode with generally good overall quality of projects. The rapid mode delivered poor quality projects even if it succeeded at maximizing expenditure. The success was at the expense of participation and developmental ownership. There was a general feeling that temporary and sustainable job opportunities were created by those who were aware of the programme. The quality of life assessment (Everatt, D. et al. 2002) indicated an increase in the economic, education, health and community indicators. But there was a drop in infrastructure. This may indicate that the type of infrastructure may not be appropriate.

The beneficiaries' perspective is that the system was effective in the immediate term by providing relief to the economic hardships they were facing. The income enabled them to provide for basic supplies and services for the family like food, health and electricity. It reduced their debt and gave them some purchasing powers. Other benefits included a general increase in self confidence, self esteem and self worth; pride of place and ownership; and a reduced crime rate. However, the stakeholders from the department suggested that the system can be considered effective if there are success stories in the community of implementation; the assets were operational and contributing positively to the communities; and the intervention is integrated into the local livelihood strategies of the people. Although it was generally agreed that poor information systems make it difficult to assess the impact.

### 1.6.4 Limitations of the system

The limitations enshrined in the system as designed by the implementers include: not addressing user requirements as defined by the beneficiaries; lack of ownership of assets created by the local municipality as envisaged;



lack of operational and maintenance plans and funds; and poor information and monitoring systems to assess impact of the system. The beneficiaries in localities that offer little or no job opportunities found the system limited in the sense that it only provided temporal job opportunities. In addition, the training received on the programme could not enable them to find alternative job opportunities or start their own business because it was too specific to the tasks that they had to perform on the programme. These limitations are perceived by the stakeholders from the department as resulting from the lack of integration and alignment of government initiatives, programmes and strategies; lack of integration of interventions with local livelihoods; uncertified job specific training; multiple objectives which are not clear to all the stakeholders; and lack of operational and maintenance plans. It has also been observed that (McCord, 2003) the limitation of the system lies in its scale; it was not large enough to contribute significantly to the level of unemployment in the country. And also the fact that the unemployed labour is generally low skilled and unskilled, makes it difficult for the system to assimilate it.

#### **1.6.5 Lessons**

At the system level, although the programme was closed in 2004, its evaluation will reveal lessons that could be used in similar interventions. There is a lot of emphasis on integration, alignment, fewer clear objectives and taking a holistic approach to designs of such interventions. Integration and alignment at a government level should be applied to the initiatives, programmes and strategies for poverty alleviation. There is also a need for integrating such interventions into the local livelihoods of communities. A holistic approach is also required regarding life cycle planning in terms of operations, maintenance and start-up funds of such assets to ensure that they do not become 'white elephants.' The general feeling is that multiple objectives limit the impact of such interventions, therefore, objectives should be stream lined. However, it is important realise that such interventions should be coupled with other social support systems for people who fall out of the targeted population. Public-Private partnerships also offer opportunities that can be explored in the area of poverty alleviation. It is important to ensure that there is continuity and learning from the success stories of good examples of alleviation poverty interventions. The beneficiaries suggest the scaling down of projects to create broader impact because it will stimulate small business activity; and the inclusion of other skills in the training like ecotourism, child and health care to introduce opportunities in other areas like ecotourism.

#### **1.6.5 Ethical perspective**

A number of ethical questions arise based on the adapted ethical framework (CSIR: 2007) regarding the CBPWP. The multiple objectives of the programme created high hopes that were not fulfilled meaning that the

system was not guided by its own principles. One of the stated goals was to create sustainable job opportunities but the low skills provided are not appropriate for the labour market. In addition, the training is too job-specific to enable starting small businesses; and short and uncertified to improve employability; while the short term employment was not integrated into local livelihoods and survival strategies. The fact that the intervention was not integrated into local livelihoods also creates personal risks in terms of sustaining financial commitments that are made while employed. Or is the assumption that no such commitments should be made. At the institutional level, local municipalities were expected to take over the assets without supporting resources. The assumptions enshrined in the programme can be considered unethical because other stakeholders not party to the design are put in comprising situations. Same goes for equity targets. The CBPWP was primarily meant for the poor of the poorest (NPWD, PMS Book 1) thus the introduction of special projects and the minister's discretion fund raise some ethical question not withholding that the budgets could have been applied appropriately. But one of the main critiques of the programme (McCord: 2003) is that it does not address the fundamental problem enshrined in the characteristics of the unemployed labour in South Africa. It may seem unfair or even unethical but to question the ethics of implementing the programme at all.

#### **1.6.6 Organisational perspective**

The CBPWP indicate some capacity and service deficiencies (CSIR: 2007) in its interactions with the contextual environment which could be managed through improved business processes and performance agreements. The programme has shown some success in term of outputs relating to assets and training. However, to achieve the outcomes of improving the standard of living and access to basic services require inputs from other role players. The desired impact of poverty reduction is affected by other parameters in the systems environment that it may even seem unfair for the organisation to evaluate itself according to that. The system is faced with interrelation issues regarding the networks with government structures, implementation bodies and communities. The ability of the organisation to interact and perform efficiently within its networks could have been improved if there was prior knowledge of these relationships and management plans. With the multiple views of the organisation, it would have been possible to foresee some of the political tensions as discussed in the ethical perspective. The organisation's perspective shows that a thorough analysis of the design from the strategy to structure would have highlighted some of the organisational limitations as indicated earlier.

#### **1.7 THE FRAMEWORK OF ANALYSIS**

As the work progressed regarding this case study as well as preparations and scoping case study two, the project team realised that it was inevitable

to develop the actual contents of different phases. The team also felt that it needed to refer back to the applicability of Systems Engineering as a concept which was the point of departure for the investigation. It was decided that the SE process should form the backbone of the Technical Perspective. In addition, ethical, political and aesthetical perspectives were excluded due to the difficulties experienced in defining them. The team is in the process of refining the framework in preparation for case study two.

### 1.8 CONCLUSION

Thus far, only the first two steps of the systems framework analysis which are problem recognition and perspective development have been applied to the CBPWP. It is evident that the systems framework of analysis has potential of making positive contributions. It is beginning to give a comprehensive understanding as well as overview of the problem and the system. This shows that the systems framework of analysis can be applied to similar interventions at design stage or during evaluation. The insights drawn can be used to improve the design of the system. The learning from this case study is relevant to the analysis of other infrastructure interventions designed with objectives of poverty alleviation.

The application of the systems framework of analysis to the CBPWP enabled the project team to identify some limitations in the framework and improve on it. The refined systems framework will be tested on the second case study.

The envisaged main output of the overall project is the framework and the accompanying analysis which can be used to make scientifically-based recommendations to CSIR and different elements in the NPAS. It can also be used to improve conceptualisation of CSIR involvement in Poverty Alleviation domain and to make contributions more sustainable and effective. The framework may also be used to contribute to the National Government Policy debate around the improvement of the NPAS.

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