

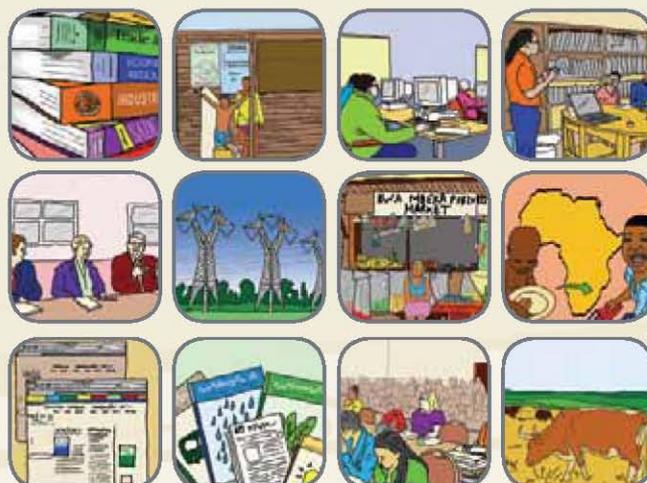
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# TIPS

TRADE & INDUSTRIAL POLICY STRATEGIES



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**An Appraisal of Local Economic Development Impact Assessment  
Methodologies in the Context of the Community Work Programme**

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TIPS

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## List of Acronyms

CES	Constant Elasticity of Substitution
CWP	Community Works Programme
CVM	Contingent Valuation Method
CV	Contingent Valuation
DCOG	Department of Cooperative Governance
DS	Direct Support
DySAM	Dynamic Social Accounting Matrix
EGS	Employment Guarantee Scheme
EPWP	Expanded Public Works Programme
IDPM	Institute for Development Policy and Management
ILO	International Labour organisation
LED	Local Economic Development
NREGA	Mahatma Gandhi National Rural Employment Guarantee
OFSP	Other Food Security Programme
PEP	Public Employment Programme
PSNP	Productive Safety Nets Programme
PW	Public Works
PWP	Public Works Programmes
RE	Randomized Evaluations
SAM	Social Accounting Matrix
TIPS	Trade and Industrial Policy Strategies

# 1 Project background

Post-apartheid South Africa has achieved reasonable economic growth, but not at a rate to effectively reduce unemployment and poverty. The benefits of growth have been heavily skewed in favour of a wealthy minority, whilst the poorer majority continue to face tough economic challenges. This extremely unequal distribution poses a real threat to South Africa's social stability. In response to the threat of social instability, the government has introduced a number of initiatives that have made inroads to reducing poverty, and creating employment especially for marginalized people. These initiatives include (but are not limited to) public works projects and public employment programmes. In fact, any initiative that serves the purpose of providing an employment safety net plays a crucial role in reducing unemployment and poverty, easing distress migration and delivering physical infrastructure and social services in ways that particularly benefit under-served communities while the job creation effects of economic growth eventually catch up and reduce unemployment.

Traditionally and historically, public employment has been driven by public works, which means that public employment was based on specific short-term projects or works<sup>1</sup>. Since 2005, public employment schemes have undergone (and continue to undergo) innovative changes. The innovations are largely based on the following dimensions: the duration of public employment programmes, the type of work performed, the implementation modalities, the objective of the interventions as well as the sustainability of said interventions. In this regard, the most striking public employment policy innovation originates from India, the famous Mahatma Gandhi National Rural Employment Guarantee commonly referred to as NREGA<sup>2</sup>. The dimensions of innovation are in the form of providing a *statutory guarantee* of 100 days' work to every rural household with unemployed members as opposed to previous Public Work Programmes PWP that focussed on completing a specific project.

However, India is not the only place where there are cutting edge innovations. In Ethiopia, the Productive Safety Nets Programme (PSNP) is attempting to replace reliance on food aid with more sustainable solutions. The PSNP operates as a safety net that targets transfers to poor households in two ways, through public works (PW) and direct support (DS). Public works, the larger of the two programs, pays selected beneficiaries approximately US\$0.75/hour for their labour on labour-intensive projects designed to build community assets. Direct support, in the form of cash or food transfers, is provided to labour-scarce households, including those whose primary income earners are elderly or disabled, in order to maintain the safety net for the poorest households that cannot participate in public works. The PSNP is complemented by a series of food security activities, collectively referred to as the Other Food Security Programme (OFSP). Beneficiaries of the OFSP receive at least one of several productivity-enhancing transfers or services, including access to credit, agricultural extension services, technology transfer (such as advice on food crop production, cash cropping, livestock production, and soil and water conservation), and irrigation and water harvesting schemes. Beneficiaries are expected to remain in the PSNP for three years.

Historically, public works programmes were time-bound and focused on specific projects. As Public Employment Programmes (PEPs) became more innovative, the focus of PEPs has been shifted towards longer term objectives. For example, India's employment guarantee is positioned as a part of its climate adaptation and green jobs strategy which spans a long time horizon while that of Ethiopia is focused on food security and thus centred on a sustainable solution to what has been a long-term problem. South Africa's Expanded Public Works Programme includes a focus on labour-intensive infrastructure, but also introduced the first public employment programmes targeting the social sector. It also has public employment programmes targeting the environmental sector, and has more recently included a further innovation in the form of the Community Work Programme (CWP).

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<sup>1</sup> Employment Guarantee Schemes (EGSs) are a subset of Public Works Programmes (PWPs), but EGSs should not be confused with PWP's broader category of interventions, which typically provide only once off and short-term employment opportunities. EGSs are distinctive in that they guarantee employment to a specified population over a sustained or indefinite period, in effect representing a form of unemployment or income insurance.

<sup>2</sup> NREGA, which began in 2006, has over 8 million participants, and is funded by a donor consortium led by the World Bank.

The CWP aims to provide an employment 'safety net' that provides access to a minimum level of regular work on an on-going and predictable basis for those who require it the most - unemployed and underemployed people at the local community level. In practice, the CWP offers two days of work a week (or the monthly equivalent), providing 100 days of work spread throughout the year at a daily rate of R60 (as of November 2010). Another difference between the CWP and other PEPs is the role that the community plays in deciding what work should be done, based on the consensus that such work should improve the area and the quality of life for the local community<sup>ii</sup>.

The Employment Promotion Programme (EPP) funded the pilot phase of the Community Work Programme. The CWP was handed over into government as a new component of EPWP on 1 April 2010. As of March 2011, the CWP had over 99 000<sup>iii</sup> people enrolled in the programme over the total 74 sites all over South Africa.<sup>3</sup>

The CWP is multi-sectoral, but with a strong emphasis on social services – amongst other things. South Africa is still the only place in the world to include social services within its public employment 'menu'. These social services include home-based care, Early Childhood Development Centres, provision of care for vulnerable households (i.e. orphans, elderly and the infirmed) and public awareness work raising awareness around alcohol and drug abuse.

In all the previously stated examples of PEPs, there is a shift towards a longer-term commitment to public employment; although in different forms. In addition to this, the innovative PEPs all have a spatial dimension incorporated into them, with all the described PEPs providing an *on-going* employment safety net at the local level.

## 1.1 Problem statement

There is no doubt of the direct impact that PEP has on the lives and well-being of programme participants.<sup>4</sup> The indirect impact may not be abundantly clear, and any attempt to measure the full impact of any PEP would have to investigate the obscure broad categories of potential impacts that include:

1. The transformative impacts of participation in work on the lives of participants;
2. The institutional impacts, including stronger participation in local development planning;
3. The social and economic impacts of the incomes earned: how these are used, and how this impacts on poverty indicators as well as on the local economy;
4. The impacts of the work done – of the public goods and services delivered – on the community, on the local economy, and on local market development processes<sup>v</sup>.

In a CWP Innovation workshop<sup>5</sup> on impact assessment hosted by TIPS on behalf of Department of Cooperative Governance (DCOG), evidence and experience from the site level was used to highlight a range of potential local economic development impacts of the CWP. The potential impacts that were identified by the participants fell within the broad categories of potential impacts number 3 and 4 above. Specifically, the impacts that the CWP had on the local economies mentioned in the workshop were:

- Impacts of the incomes earned on participants and households;
- Impacts of the incomes spent in the local economy;
- Impacts of local procurement on the local economy;

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<sup>3</sup> As it stands, CWP has 19 sites in the Eastern Cape, 7 in the Free State, 3 in the Western Cape, 4 in the Northern Cape, 6 in Mpumalanga, 7 in North West, 6 in Limpopo, 11 in Gauteng and 11 in Kwazulu-Natal.

<sup>4</sup> This section draws on earlier work done by Phillips (2010).

<sup>5</sup> CWP Innovation Workshop in May 2011, held at the ORT Protea Hotel, Johannesburg.

- Impacts of the assets and services created;
- Financial inclusion through payments into bank accounts;
- Impacts on savings and savings institutions;
- Role of incomes in mitigating risk, underpinning other economic initiatives<sup>6</sup> – i.e. the informal sector;
- Impacts on local labour market dynamics – for example effects on labour force participation, migration, work search, casual labour rates, etc.

During the workshop discussions, it became apparent that the CWP (and by extension all other PEPs) have multiplier effects that trickle throughout the economy at the local level. These effects go beyond the socio-economic benefits that accrue to the immediate PEP beneficiaries. A challenge is then to measure the full impact of such an intervention. Determining the true value of the potential impact of PEP is a challenging task. This is because while some potential impacts (namely impacts 3 and 4 reported above) can be measured with some degree of accuracy, some outcomes are, in contrast, not easily verifiable (particularly potential impacts 1 and 2 reported above).

The literature review in the following section 2 attempts to address the problem of measuring the impact of PEPs – and specifically the CWP – on local economic development. Taken to scale, this should include impacts on poverty, inequality, and even on economic growth.

The World Bank defines Local Economic Development (LED) as the establishment of economic capacity of a local area with the aim of improving the locality's economic future and the quality of life for all. The World Bank goes on to define LED as local people working together with the hope of achieving sustainable economic growth that yields economic benefits and improves the quality of life for all in a community.<sup>7</sup> LED is a consequence of collective action from all actors within the economic sphere (public, business and civic organisations) with the aim of improving conditions for economic growth and employment generation. LED has been identified as one of the most important ways of decreasing poverty and creating sustainable employment.

The principal difference between LED and traditional one-dimensional approaches to economic development<sup>8</sup> is that LED combines a number of approaches and tools into a systemic and sustainable concept which cuts across many different portfolios<sup>9</sup>. Economic development at the national level is such a holistic and multidisciplinary approach that it often ends up producing enormous complexity with regard to issues and actors. LED on the other hand, focuses on the local and regional level, infinitely reducing this complexity and allows economic actors to pursue an integrated path of economic development. By its very definition LED is a territorial concept and falls into the overarching national development process with a specific emphasis on economic aspects.

One of the key elements of LED is community development, and PEPs such as the CWP are all about community development. In achieving community development, CWP makes use of local labour, and creates an employment safety net for individuals who would otherwise be unemployed. CWP employment creation makes a critical link to LED in that there is an income injection into the local economy.<sup>9</sup> In addition to this, the outcomes of most of the CWP programmes benefit the community as a whole, in both the long and short run. For example, community food gardens provide a short-term benefit, while removal of litter from rivers that feed into the dams yield significant long term benefits (two – three year time horizon). In a broad sense, the measurable objectives of CWP and those of

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<sup>6</sup> The securing an income frees up other income that could be as capital in what could be riskier in come generating ventures, for example purchasing stock for a "spaza" shop.

<sup>7</sup> The 'community' here can be defined as a sub-district, city, town, metropolitan area, or sub-national region.

<sup>8</sup> These approaches include national industrial policy, technology transfer, SME support initiatives, infrastructure upgrading, urban planning and skills development.

<sup>9</sup> LED aims to create jobs by making the local economy grow. That being said, job creation stimulates the local economy leading to local economic development.

LED are linked, and based on this supposition, a method that is used to measure LED should be adaptable to measuring the impact that PEP such as the CWP has on the local community.

## **1.2 Objective of the study**

The objective of this study is to carry out a desktop study on the various methodologies that could be used to assess the impact of PEP on LED, showing their weaknesses and their strengths. The purpose is to identify the methodologies best suited to measure the LED effects of CWP. Ideally, a combination of methodologies should be able to do the following:

- To determine the impact of the income throughout the local economy (impact of the receipts from the PEP's on the participants in the PEP as well as the cascading effects of PEP payments as the funds circulates within the local economy).
- The impact of local procurement on the local economy
- The economic impact of the assets (food gardens, recreational parks and such like) and CWP services rendered (for example early development centres, home-based care and similar activities)
- The impact of CWP on the use of financial institutions and financial instruments
- The number of other economic initiatives that have spun off as a consequence of the extra income that CWP provides (i.e. investment decisions into productive assets that were made possible by the extra income that was sourced from CWP and;
- Impacts on local labour market dynamics – for example effects on labour force participation, migration, work search, casual labour rates, etc.

The aim of this study is to provide some preparatory research in order to better inform the design of impact assessment approaches for CWP, with potential wider applications to PEPs in general. The following section 2 is a literature review, and begins by introducing the various methodologies that are the focus of this study. It then delves into the inner workings of each of these methodologies, highlighting the advantages as well as the disadvantages of each one. Section 3 assesses each of these impact assessment methods within the context of CWP, before drawing conclusions in Sections 4.

## 2 Literature review of impact assessment methodologies relevant to LED

A wide range of studies are available focused on attempts to measure the impact of PEP on the growth of local economies. In turn, there are a wide range of tools that have been used to determine the impacts of such programmes and their related interventions. Normal survey tools and qualitative tools such as focus groups and set questionnaires are but one of many standard tools that can be used to get insight into the dynamics in any local economy.

At one end of the spectrum are complex models such as Social Accounting Matrixes (SAMs) and Dynamic SAMs (DySAMs), while at the other end of the spectrum there is the relatively simple interactive daily documenting of a household's financial decisions as is the case with FinMark's financial diaries. Somewhere within this spectrum lie a number of other methodologies that include the use of randomized control trials and a 'poverty laboratory Randomized Evaluation' (RE) approach. Given the community based nature of the CWP, there is a need to understand the strengths and weaknesses of these various methodologies in capturing the kinds of local economic development impacts outlined above, and an understanding of what impacts they can and cannot be assessed.

### 2.1 Financial diaries

Financial diaries were pioneered by the Institute for Development Policy and Management (IDPM) at the University of Manchester and were constructed for the purposes of painting a comprehensive picture of the financial inflows and outflows of poor households in order to assess a specific set of pre-defined objectives. This is achieved by gathering data on income, consumption, savings, lending and investment over the course of a year (at bimonthly intervals).

A Financial Diaries project would normally be a year-long household survey that examines financial management in poor households with the objective of developing a multi-dimensional, comprehensive set of data on household financial management that has both qualitative and quantitative attributes. This methodology allows one to capture financial instrument usage across different types of households and track that usage over time. Not only would the financial flows be captured, but also the nature of the decisions that went with those flows. Texture of decisions refers to questions such as why a transaction was entered into, the intent behind the strategy driving the transactions, as well as how lump sums of money were used. The depth of this data set allows one to explore a host of issues related to the use of financial devices. In South Africa, a similar methodology was used in a study carried out by the South African Labour and Development Research Unit (SALDRU) based at the Centre of Social Science Research at the University of Cape Town<sup>vi</sup>.

Financial diaries use questionnaires to assess how poor households make their financial decisions and make use of financial institutions and financial instruments. With the ability to record financial flows in great detail, the financial diaries methodology is a powerful tool in understanding the financial behaviours of impoverished households. This methodology also provides a view inside the household "black box" and gives the opportunity to observe how low-income populations live their lives on a daily basis, including the effects of particular social interventions. It also allows a chance to track changes in the roles that individuals play within households in decisions about how to manage money.

The goal is to capture key junctures when households use a particular innovation and compare the results to households without access to the innovation. In this way, one can assess the impact of an innovation on the overall well-being of the recipients of that service. The methodology centres on tracking inflows and outflows of cash and non-cash household resources on a bi-weekly basis. A team of local fieldworkers, visit participants fortnightly and asks them to recount all resources that came into the household/business and all resources that left the household/business over the past two weeks, down to the finest detail — every bar of soap bought, every basket of tomatoes sold, and every cash gift received. Using this methodology, one can analyse the data at: transaction, individual, and household levels.

Given the resource intensity of the data collection, the length of the data collection period, and the resource implications, there is a limitation to the number households that can be included in a study. Consequently, the selection criteria of the households who are meant to be included in a study that involves financial diaries are critical.

A number of criteria used to select the participants can be broadly classified into three categories. The *first* was in terms of ensuring that the selected households were typical – economically, socially and culturally – of a community. *Secondly*, was familiarity: all households are in areas where one or more of the research team had some knowledge of the local economy. The *third* criterion is access: by their very nature, fortnightly interviews<sup>10</sup> demand that the research team be stationed locally. Other criteria that were used were study/project objective specific.

The advantage of using financial diaries is that the depth of the information collected is rich and detailed, and has the potential to reveal the spending patterns of households that are linked to any PEP. The most apparent disadvantage is the cost associated with running extensive interviews over a long period of time. In order to carry out a complete survey of all the participants of the order of CWP (99, 000 participants), the budgetary implications would be dire. As a result, there will always be a limitation to the number of households to include in the study when one opts to employ this method. The final shortcoming of this methodology is the high likelihood of the respondents developing research fatigue throughout the process.

A way around the aforementioned that hurdles would require some innovative thinking and some of the suggestions that come to mind include using a representative sample of all the CWP beneficiaries and focussing all the resources on that sample. In order to further reduce costs, one would employ a select group of competent CWP beneficiaries to work as field agents and collect the data for the survey. To overcome research fatigue, one would perhaps seek to incentivise the participation in the study in a subtle manner without prejudicing the outcome of the study.

The keeping of financial diaries has been used mostly in microfinance and consumer surveys and mainly for the purposes of impact assessment of specific interventions by running a comparison of a group exposed to the intervention to another group that has not been exposed to the intervention. To the authors' knowledge, this methodology is yet to be used within the context of LED within a PEP setting- presenting an opportunity for a novel innovation.

## 2.2 Social Accounting Matrices (SAMs)<sup>vii</sup>

A SAM is an economy-wide data framework, typically representing the economy of a nation/local economy and its uniqueness lies in its analytical and predictive use as a tool to represent and forecast system-wide effects of changes in exogenous factors. It comprises a comprehensive, disaggregated, consistent and complete data collection that captures the interdependences that exist within a socio-economic system<sup>viii</sup>. When, for example, households experience an increase in disposable income - perhaps through the proceeds of participating in PEP - they could spend more money on fresh food or beverages from local outlets. They might then go to a local supermarket and spend a larger share of their income there. Supposing that this is a phenomenon that occurs with all the households in the locality, the consequence would be that the supermarket - or the retail sector in general - needs to obtain more products from the food production sector, which raises its demand for agricultural products. Because of this increasing demand, more labour input is needed which increases the income of certain households even more, who again could spend more money. This kind of interdependency between sectors and households can very well be captured within a SAM. In developing countries, the SAM has been used widely to explore issues such as income distribution<sup>ix</sup>, the role of the public sector<sup>x</sup>, and the impact of inter-sectoral linkages on (rural) poverty alleviation<sup>xi</sup>.

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<sup>10</sup> Fortnightly interviews are critical in order to minimize the risk of chosen respondents relying on recollection of their r transactions.

As expected with most economic accounting systems, a SAM records transactions taking place during an accounting period, usually one year. A SAM has three characteristic features. *First*, the accounts are represented as a square matrix, where the incomings and outgoings for each account are shown as a corresponding row and column of the matrix. The transactions are shown in the cells, so the matrix displays the interconnections between economic actors explicitly. *Secondly*, a SAM is comprehensive, as it shows all the economic activities of the system (consumption, production, accumulation and distribution), although not necessarily in equivalent detail. *Thirdly*, a SAM is flexible. Although it is usually set up in a standard, basic framework, there is a large measure of flexibility both in the degree of disaggregation and in the emphasis placed on different parts of the economic system.

As it is an accounting framework, not only is the SAM square, but also the corresponding row and column totals must be equal. Clearly, at one extreme, any set of macroeconomic aggregates can be set out in a matrix format. However, this would not be a 'social' accounting matrix in the sense in which the term is usually used. An overriding feature of a SAM is that households and household groups are at the heart of the framework. Only if there is some detail on the distributional features of the household sector can the framework truly be called a 'social' accounting matrix. Also, a SAM typically shows much more detail about the circular flow of income, including transactions between different institutions (including different household groups) and between production activities, and in particular records the interactions between both sets of agents via the factor and product markets.

The standard national SAM distinguishes between the activity account<sup>11</sup> (an account which caters for production activities) and the commodity account (an account for domestically produced goods/services and the goods and services from/to foreign countries are marketed). Thus an activity column allocates total production costs in producer prices whilst an activity row collects revenues of production activities from home or foreign consumption. A column of the commodity account represents the supply of composite commodities to home markets that arise from domestic production and import; and its row represents total interior demand. In other words, a commodity column disseminates aggregate absorption in the economy to domestic production and world markets and tax revenues of government in market prices, whereas its row aggregates total domestic absorption of the economy including intermediate inter-sectoral demands.

A great advantage of a SAM is its ability to capture a wide variety of developments in an economy, as it links production factor and income accounts. A large share of economic interactions take place within the household sector and a SAM disaggregates the cells involving 'returns for labour' and the household sector into smaller groups (such as different income groups) to show the effect of the different behaviour of these groups. Furthermore, it is a relatively efficient way of presenting data as the presentation of data in a SAM immediately shows the origin and destination of the various flows included. Another advantage is its usefulness as a tool to reconcile different data sources and fill in the gaps. This enables the reliability of existing data to be improved and inconsistencies in data sets of different nature and origin to be revealed.<sup>xii</sup>

Another advantage of the SAM is its ability to predict changes in economic agents'/actors' spending habits in the event of a change in some exogenous factor. The former is achieved in the most basic form by a multi-agent approach, where each agent/actor represents one (or more) households belonging to one of several socio-economic groups. Once the agents/actors are defined, and a SAM of the local economy is constructed, a spending matrix can be set up for the purposes of predicting an agent's /actor's spending decisions, (given the actor's spending decisions are defined). Computer simulation techniques (Artificial Intelligence) can be used to give the agent the possibility to make decisions on how to satisfy these spending priorities. Also, social dynamics, the simulation of strategic planning behaviour, learning, and exchange in limited networks can be incorporated into the decision making process, bringing the outcome as close to reality as possible.<sup>12</sup>

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<sup>11</sup> An activity account is equivalent to the productive sectors in input-output tables.

<sup>12</sup> The models provide a relatively simple structure to examine the potential effects of exogenous policy (or external) shocks on incomes, expenditures and employment, and the like for different household groups, within the context of a fixed price setting. The model should work out the broad orders of magnitude and directions of effects, provided the underlying assumptions are correct. Circumstances where the model will likely give inaccurate

Most of the disadvantages of a SAM concern the production activities accounts. Important, and sometimes restrictive, assumptions made in the SAM are that all firms in a given industry employ a constant production technology<sup>13</sup> (usually assumed to be the national average of input, output and labour for that industry), and produce identical products. Because the tables are produced only for a certain period, the model can become irrelevant as a forecasting tool when production techniques change. Other disadvantages are that the model assumes that there are no economies or diseconomies of scale in production or factor substitution, and that they do not incorporate the existence of supply constraints. In a rather static situation, these *ceteris paribus* conditions are a perfectly acceptable position which has demonstrated its great relevance in a long (spatial) economic research tradition. However, in a highly dynamic context, with complex space-time system interactions, stable solution trajectories are less likely to occur.<sup>xiii</sup> Finally, the production accounts are essentially based on a linear production technology (e.g. doubling the level of agricultural production will in turn double the inputs, the number of jobs, etc.). This reveals something of the inflexibility of the model. Thus, the model is entirely demand-driven, implying that bottlenecks in the supply of inputs, or increasing efficiency effects are largely ignored.<sup>xiv</sup> Another limitation is the assumption of fixed prices in SAMs.

There are also some practical problems in the development of a (local) SAM. The statistical estimation of a new matrix is very labour-intensive and expensive. This is mainly because much of the information is gathered with the help of micro-survey questionnaires. A related problem with this method is that interviewees, firms, or households, are not always able to give correct answers. Sometimes they do not understand the question, or they do not want to tell the truth, and therefore - as a result of a response bias - the results are not always perfect. That being said, a SAM is still a very useful tool in that it shows effects throughout the whole economy, linking the different accounts.

Classic examples of the use of SAM to establish the extent to of LED include the work of Leatherman & Marcouiller (1996) who focussed on the prospects for rural economic development and made use of a SAM analysis to examine the distributional characteristics associated with local economic development policies targeting agricultural production, agricultural processing, forestry production, forestry processing, and tourism for a small rural region in Wisconsin. In this instance, the SAM analysis was used as a means to measure the impact of local development policies in addressing questions of lagging rural income growth.

Another example is the recent work carried out by Grant *et al.* (2008) that focussed on the effect of community benefit payments given to communities that are involved in renewable energy projects (an expression of the renewable energy developers' "good will") to be used by the community in whatever way they deem reasonable. In this study, the focus was on the Shetland Islands with the aim of evaluating the potential local economic and employment impact of a large onshore wind energy project proposed for the Islands. This was achieved through the use of a SAM.

In the context of PEPs, Hiraway (2006) did some work on Nana Kotda in India. The paper analyses the multiple impacts of employment guarantee programmes in India within the National Rural Employment Guarantee Act (NREGA) framework. The novelty of the study is that it develops a village level Social Accounting Matrix (SAM) to assess selected dimensions of the study's predefined impacts.

A village level SAM was constructed for the village of Nana Kotda<sup>xv</sup> utilised the custom village SAM to demonstrate that NREGS (or other PEPs), when implemented well and at scale, can reduce poverty and empower poorer communities in the short-run. Furthermore, the multiplier analysis conducted through the SAM demonstrated the positive impact that NREGS had on incomes, production and employment in the village of Nana Kotda.

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multiplier estimations are in instances where an economy faces bottlenecks in any sector, in the supply of goods or services, or in key factors of production. The usefulness of multipliers is limited to examining the real-side effects of quantity-based shocks. Multipliers cannot handle price shocks or ascertaining price effects.

<sup>13</sup> Typically, production technologies are specified using Constant Elasticity of Substitution (CES) functions that describe how different types of inputs can be substituted for each other as determined by the elasticity coefficients. The SAM uses fixed coefficients in production, and as such fails to cater for any changes in the production process.

## 2.3 Dynamic Social Accounting Matrix (DySAM)<sup>xvi</sup>

A Dynamic SAM (DySAM) is an instrument based on an existing 'static' SAM. The DySAM is designed to support and strengthen national development strategies by analysing the effects of investment planning on the economy in a system currently being implemented. DySAMs are specifically configured to explore the relationship between intensive employment strategies and job creation, and ultimately, poverty reduction.

The DySAM was born out of the need to analyse dynamic real-time data. More concretely, a DySAM has to be able to deal with the four main problems of a static SAM that include:

- A SAM model is static with fixed coefficients;
- Data in the SAM refer to one single period (normally a year);
- The year of the SAM is normally not current;
- A SAM lacks behaviour, which means that the static SAM gives a snapshot of the economy, devoid of the consistent evolution of the economic structure over time.

It is these properties that allow the DySAM to be used for: (i) counterfactual simulation analysis, for example a given magnitude of exogenous injections in any year within the period for which the DySAM is computed. This helps to validate valuable experiences such as analysis of completed public policies/programmes; and (ii) short-run policy simulations from the terminal year and after.

The contrasts between the traditional 'static SAM modelling' and DySAM modelling can be summarized as follows:

1. A DySAM is a tool that is based on an *existing static SAM* for the economy of a country and the available data from national accounts, balance of payments, budget and financial statistics;
2. The static SAM gives a snapshot of the economy, while a DySAM shows the consistent evolution of the economic structure over time, for periods covering the years before and after the static SAM;

Combining 1 and 2 above, a DySAM thus helps to identify cross-section and time-series data problems and improves the data gathering processes.

3. Several sequential SAMs over time imply dynamics;
4. Shifts over time reflect technology choices;
5. A DySAM lessens the need to calculate expenditure income elasticities in order to introduce behaviour, i.e. SAM fixed-price model<sup>xvii</sup>;
6. There will always be one DySAM period that matches the surveys (e.g. labour, household expenditure, population, etc.), which eliminates the need to introduce time-bound assumptions;
7. An employment satellite account for one or several years with disaggregated labour market data can be added and coupled with the DySAM, and matched with the exact year of the particular survey;
8. A DySAM allows the use of place holders when information is scarce, missing or not fully reliable. This can be done via satellites, for instance, to dynamise the sectoral disaggregation of the construction sector;
9. The use of place holder values eliminates the need to hold up programming before final data are provided;
10. The DySAM can be updated when new data become available or when a more current SAM and/or System of National Accounts (SNA) time-series data come on-stream.

As is the case in all modelling attempts the, accounting consistency<sup>14</sup> is of paramount importance. One cannot over-emphasise the importance of a time-consistent and reliable database consistency to allow the derivation of dynamic SAM multiplier sequences. It goes without saying that the base year, the SAM structure, the number of accounts, the types of classifications and the account openings will limit or enrich the quality of analysis that may be envisaged.

While modelling with a dynamic SAM, similar to static SAM modelling, satellite accounts can be used to introduce a wider range of analyses. Satellites can be of the 'expanding or extending' types. The former refer to the use of information to 'blow out' existing entries in the SAM. For instance, the original SAM household and labour factor classifications can be increased or altered. Similarly, the construction sector can be separated into various types of activities or commodities (i.e. infrastructure, roads, irrigation, etc.). The latter refer to the extension of certain accounts with directly linked physical information. Such information types can be as varied as employment, environmental aspects, types of housing, demographic information and morbidity satellite tables, to name a few.

The DySAM multiplier analysis, using the SAM framework, helps to gain a better understanding of the dynamic-interdependent linkages between the different sectors of the economy and the institutional agents at work within the society, namely households, enterprises and the government. The SAM and the DySAM face the same practical problems in their construction, i.e. the high cost and labour intensity of the data collection and the response bias.

## **2.4 Laboratory randomized evaluation of poverty <sup>xviii</sup>**

Any attempt at drawing a causal inference question such as: "What is the causal effect of PEP on LED?" requires answering the counterfactual question: "How would individuals who participated in PEP have fared in the absence of the program?" or "How would those who were not exposed to the PEP have fared in the presence of the program?". The challenge of these questions immediately becomes apparent. At any given instance, an individual is either exposed to the program or not.

The argument put forward by proponents of randomized evaluation centres around the fact that comparing the same individual over time may (in most cases) not give a reliable estimate of a program's impact since other factors that affect outcomes may have changed since the program was introduced. The extension of the argument goes on to say that one cannot, therefore, obtain an estimate of the impact of the program on a given individual by monitoring the same individual over time. The only way the average impact of a program/policy (as argued by proponents of randomized evaluation) on a group of individuals can be accurately measured is by comparing them to a similar group of individuals who were not exposed to the program.

The latter requires a comparison group, i.e. a group of people who, in the absence of the treatment<sup>15</sup>, would have had outcomes similar to those who received the treatment. In reality, however, those individuals who are exposed to a treatment generally differ from those who are not. Programs are placed in specific areas (for example, poorer or richer areas), individuals are screened for participation (for example, on the basis of poverty or motivation), and the decision to participate in a program is often voluntary, which creates the problem of self-selection. For all of these reasons, those who were not exposed to a treatment are often an inadequate comparison group for those who were. Any difference between the groups can be attributed to both the impact of the program or pre-existing differences (the "selection bias"). Without a reliable way to estimate the size of this selection bias, one cannot decompose the overall difference into a treatment effect and a bias term.

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<sup>14</sup> The SAM is read from column to row, and as such each entry in the matrix is sourced from its column heading, going to the row heading. The accounting consistency referred to here is the requirement that each column is summed up to equal each corresponding row.

<sup>15</sup> Treatment refers to the policy intervention or Programme in this case the inclusion in a specific PEP.

One setting in which the selection bias can be entirely removed is when individuals or groups of individuals are randomly assigned to the treatment and comparison groups. In a randomized evaluation, a sample of individuals is selected from the population<sup>16</sup> of interest. This experimental sample is then divided randomly into two groups: the treatment group and the comparison (or control) group. The treatment group then is exposed to the treatment while the comparison group is not. In such a setting, the outcome is observed and compared for both treatment and comparison groups.

For example, out of 100 potential PEP participants, 50 are randomly chosen to participate in the PEP, while the other 50 are excluded from participating in the PEP. Given the treatment has been randomly assigned, individuals assigned to the treatment and control groups differ only through their exposure to the treatment. Had neither received the treatment, their outcomes would have been expected to be the same.<sup>17</sup> This implies that the selection bias is removed, which suggests that when a randomized evaluation is correctly designed and implemented, it provides an unbiased estimate of the impact of the programme.

The obvious criticism of this approach is the question of who participates in randomized evaluations. In answering this question, an evaluator must consider what is ethical and fair. It would be unethical, for example, to deprive a household of an income for the sake of an experiment if the household would have otherwise had access to the income. The effectiveness of assessing the impact of an intervention using randomized evaluation depends on the timing of the evaluation. Ideally, the evaluation should not come too soon, i.e. when the program is still taking shape and kinks are being ironed out. And the evaluation should not come too late, i.e. after money has been allocated, and the program rolled out, so that there is no longer space for a control group. The best time to carry out a randomized evaluation is therefore during the pilot phase of a program or before scaling up.<sup>18</sup>

## 2.5 Dollar-based ecosystem valuation methods<sup>xix</sup>

The economic impact of the assets that include food gardens and recreational parks was identified as one of the impact assessment variables earlier on in section 1. This sub-section is dedicated to identifying the best placed currency-based ecosystem valuation methods that have been used by studies that sought to estimate the value of Ecosystems.

Conventional economics prescribes that economic value be based on measured on what people want; and it is these very same that should be the judges of what they want. The concept of value in conventional economics is the maximum amount of one thing an individual is willing to give up to get more of something else. Strictly speaking the aforementioned is considered a fair measure of the relative "value" of the two things to that person. Currency units (Dollars, Rand, Euro etc.) are a universally accepted measure of economic value because the amount that people are "willing to pay" for something reflects how much of all other for-sale goods and services they are willing to give up to get it.

In order to evaluate the perceived economic value for ecosystem services, and equally so for the value of CWP environmental services infrastructure, i.e. recreational parks, it is important to note that measuring the value of something using currency units does not require that it be bought and sold in markets. It only requires estimating how much purchasing power people would be willing to give up to get it (or would need to be paid to give it up), if they were forced to make a choice.

There are various methods that are used to estimate dollar measures of economic values associated with ecosystems. These include:

- 1) Market Price Method: The market price method estimates the economic value of ecosystem products or services that are bought and sold in commercial markets. The market price method can be used to value changes in either the quantity or

<sup>16</sup> Note that the "population" may not be a random sample of the entire population and may be selected according to observables. Therefore, we will learn the effect of the treatment on the particular sub-population from which the sample is drawn.

<sup>17</sup> For an elaborate mathematical proof see Dufllo *et al.* (2006).

<sup>18</sup> During these phases, there are often important questions that an evaluator would like to answer: How effective is the program? Is it effective among different populations? Are certain aspects working better than others, and can "the others" be improved? Is it effective when it reaches a larger population?"

quality of a good or service. It uses standard economic techniques to measure the economic benefits from marketed goods, based on the quantity people purchase at different prices, and the quantity supplied at different prices.

- 2) **Productivity Method:** The productivity method, also referred to as the net factor income or derived value method, is used to estimate the economic value of ecosystem products or services that contribute to the production of commercially marketed goods. It is applied in cases where the products or services of an ecosystem are used, along with other inputs, to produce a marketed good.
- 3) **Hedonic Pricing Method:** The hedonic pricing method is used to estimate economic values for ecosystem or environmental services that directly affect market prices. It is most commonly applied to variations in housing prices that reflect the value of local environmental attributes. It can be used to estimate economic benefits or costs associated with environmental quality, including air pollution, water pollution, noise and environmental amenities, such as aesthetic views or proximity to recreational sites.
- 4) **Travel Cost Method:** The travel cost method is used to estimate economic use values associated with ecosystems or sites that are used for recreation. The basic premise of the travel cost method is that the time and travel cost expenses that people incur to visit a site represent the “price” of access to the site. Thus, peoples’ willingness to pay to visit the site can be estimated based on the number of trips that they make at different travel costs. This is analogous to estimating peoples’ willingness to pay for a marketed good based on the quantity demanded at different prices.
- 5) **Damage Cost Avoided, Replacement Cost, and Substitute Cost Methods:** The damage cost avoided, replacement cost, and substitute cost methods are related methods that estimate values of ecosystem services based on either the costs of avoiding damages due to lost services, the cost of replacing ecosystem services, or the cost of providing substitute services. These methods do not provide strict measures of economic values, which are based on peoples’ willingness to pay for a product or service. Instead, they assume that the costs of avoiding damages or replacing ecosystems or their services provide useful estimates of the value of these ecosystems or services.
- 6) **Contingent Valuation Method:** The contingent valuation method (CVM) is used to estimate economic values for all kinds of ecosystem and environmental services. It can be used to estimate both use and non-use values, and it is the most widely used method for estimating non-use values. It is also the most controversial of the non-market valuation methods. The contingent valuation method involves directly asking people, in a survey, how much they would be willing to pay for specific environmental services.
- 7) **Contingent Choice Method:** The contingent choice method is similar to contingent valuation method, in that it can be used to estimate economic values for virtually any ecosystem or environmental service, and can be used to estimate non-use as well as use values. Like contingent valuation, it is a hypothetical method – it asks people to make choices based on a hypothetical scenario. However, it differs from contingent valuation because it does not directly ask people to state their values in dollars. Instead, values are inferred from the hypothetical choices or trade-offs that people make.
- 8) **Benefit Transfer Method:** The benefit transfer method is used to estimate economic values for ecosystem services by transferring available information from studies already completed in another location and/or context. For example, values for recreational fishing in a particular province may be estimated by applying measures of recreational fishing values from a study conducted in another province.

### 3 Impact assessment in the context of CWP

This section will focus on the strengths of each of the described methodologies with respect to the specific measurable outcomes that one would use to measure the impact of the CWP, defined as follows:

***To determine the impact of the income throughout the local economy (impact of the receipts from the PEPs on the participants in the PEP as well as the cascading effects of PEP payments as it circulates within the local economy).***

The impact of the cash injection from CWP wages into the local economy and the effect that the cash injection has on LED is built on the premise that poverty-stricken communities are poverty-stricken because poor people spend little, and as a result, there is a lack of money circulating within the local economy. Simply put, the lack of money circulation is one of the principle elements limiting LED. An extension of this premise leads to the notion that the more incoming money is passed from hand to hand within the local economy, the more the local economy will be stimulated. The multiplier effects of the incomes from the CWP unfold as they ripple through the economy and increase the local circulation of money inside a community to stimulate LED.

Of the methodologies described above, the best one to measure the effects of increased monetary circulation in the local economy would be the SAM and a DySAM. Financial diaries would be able to help track the use of CWP income throughout the local economy, but would be useless in their ability to predict the impact of say a 10% increase in the CWP wage, whereas a SAM could be constructed to model such changes.

#### ***The impact of local procurement on the local economy***

Financial diaries kept by local procurement sources would be extremely useful to help track the use of CWP income throughout the local economy and the comparison would be based on local trade before the commencement of the programme and after the commencement of the programme. The other methodology that would clearly show the impact of CWP local procurement would be a poverty laboratory randomized experiment that would compare two similar businesses in an area that was exposed to the intervention to a business that was not exposed to the intervention. The major problem would be to find businesses that are comparable.

#### ***The economic impact of the assets (food gardens, recreational parks and the like) and CWP services rendered (for example early childhood development centres, home-based care and similar activities)***

Ideally, one would imagine the best way to capture the economic impact of community assets and services that are created by CWP would be in the form of a combination of two methodologies, the laboratory randomized evaluation of poverty method and the keeping of financial diaries. The idea would be that two similar communities, one that has been exposed to CWP and one that is in a similar position, but has not been exposed to the programme, would both keep financial diaries tracking the impact that these services have had on the community. In addition to this, the participants could also be asked to keep a simplified “time sheet” that records the number of hours spent carrying out household chores, engaging in income generating activities, recreation. This would allow one to estimate the savings that have occurred as a result of time not spent on taking care of the sick, child-minding and similar activities that CWP provides.

The economic impact of food gardens can be determined by keeping records of the production output from the community gardens, and recording the quantities and market value of produce that is either distributed or sold to the community. This can then be matched with the financial diaries entries from the members of the local community to ensure consistency.

The determination of economic impacts of a recreational park and similar sources of environmental services may not be as simple to ascertain, because it is difficult to assign an economic value to an individual's subjective values, although natural resource economists use some methods to determine these values, an example being the Contingent Valuation Method (CVM)<sup>19</sup>. There are also a number of methods that can be used to evaluate the value of different types of ecosystem and environmental services. These are highlighted in Section 2.5 above (p.13).

***The impact of CWP on the use of financial institutions and financial instruments and the number of other economic initiatives that have spun off as a consequence of the extra income that CWP provides (i.e. investment decisions into productive assets that were made possible by the extra income that was sourced from CWP that led to informal sector activities)***

Again the best way to measure this impact would be a RE experiment that also makes use of financial diaries kept by participants that have been exposed to the programme. These could be compared to a community who has not yet had the privilege of participating in the community works programme. Critically, this method should enhance the measurement of improved capabilities, i.e. moving beyond 'what was done' approaches to understanding "why it was done" elements related to human choice and behaviours.

***Impacts on local labour market dynamics – for example effects on labour force participation, migration, work search, casual labour rates, etc.***

Of the methodologies described above, the best ones to measure the effects of labour force participation in the local economy would be the SAM and a DySAM. Employment multiplier analysis in SAMs can be utilised to gain insights into the impacts of PEP interventions on the labour dynamics of a localised economy.

## 4 Conclusions

As it currently stands, there are some methodological gaps - or perhaps more precisely a lack of clarity and consensus on approaches that would explicitly reveal the full impact that the CWP (and indeed all the other previously discussed PEPs) has had on LED. The various methodologies outlined above represent a preliminary assessment of potential impact assessment methods to evaluate the CWP's contribution to Local Economic Development in the numerous geographic or site levels. As described in Section 3, the various methodologies have within them, respective advantages and disadvantages. In the same manner, the varying methodologies can be utilised according to the primary objective of the impact assessments.

Given the diverse range of social and environmental services provided through the activities of the CWP, no single methodology significantly assesses the socio-economic impact of the CWP in its full spectrum. Consequently, a combination (of two or more) of the methodologies may be required to introduce a structured monitoring and evaluation framework for gauging the impact the CWP (or other public employment programmes) on local economies.

Further investigation (and costing) of impact assessment methods is required in order to present a holistic overview of the most appropriate methodologies to measure the effectiveness of public employment programs in developing economically marginalised communities in South Africa. In any likelihood, a combination of the various differing methodologies may be required to capture the economic impact of the CWP in its full spectrum on communities broadly, and local economies more specifically.

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<sup>19</sup> The CVM is referred to as a "stated preference" method, because it asks people to directly state their values, rather than inferring values from actual choices, as the "revealed preference" methods do. The fact that CV is based on what people say they would do, as opposed to what people are observed to do, is the source of its greatest strengths and its greatest weaknesses.

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<sup>ii</sup> Department of Cooperative Governance & Community Works Programme (2011)  
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<sup>iv</sup> Philips (2009)  
<sup>v</sup> The South African LED Network (2010)  
<sup>vi</sup> Collins (2004)  
<sup>vii</sup> This section relies on work done by Round (2003)  
<sup>viii</sup> Isard (1998)  
<sup>ix</sup> Adelman *et al.* (1978)  
<sup>x</sup> Pleskovic & Trevino (1985)  
<sup>xi</sup> Khan (1999)  
<sup>xii</sup> Alarcon (1991)  
<sup>xiii</sup> Nijkamp (2007)  
<sup>xiv</sup> van Leeuwen *et al.* (2005)  
<sup>xv</sup> Hiraway (2006)  
<sup>xvi</sup> This section relies heavily on the work of Alarcón *et al.* (2011)  
<sup>xvii</sup> Pyatt & Round (1979)  
<sup>xviii</sup> This section relies on prior work carried out by Duflo *et al.* (2006)  
<sup>xix</sup> This section heavily relies on the work done by King *et al.* (2000)