SOUTHERN AFRICA GLOBAL COMPETITIVENESS HUB

# Improving Economic Analysis for the Government of Zambia's Ministry of Finance and National Planning


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**Background**: In response to a request from the Secretary of the Treasury at the Ministry of Finance and National Planning (MoFNP), USAID/Zambia fielded a two-person team to assess the current gaps in Zambia's ability to model and thus assess the potential effects of various expenditure options, particularly related to HIV/AIDS, agriculture, and education sectors. This paper reflects the suggestions of that team and not necessarily the views of USAID/Zambia.

**Objective:** The objective of this proposed work is to strengthen the budgeting and planning functions of the Government of Zambia (GRZ) by improving Zambian access to and ability to use good economic analysis. USAID is not targeting any specific policy changes but rather an improvement in the quality of analysis. Quality analysis is a prerequisite to good policy: poor analysis is likely to lead to policy failures.

All of the ideas in this paper were developed in concert with GRZ personnel: the ideas are theirs as the needs are ones that they recognize and want to alleviate. The ideas also benefited from considerable input from other donors, USAID personnel, and private entrepreneurs to learn their perceptions, needs and proposed activities to ascertain how to collaborate effectively.

There are many dedicated economists within government who have the skills that are needed to do improved analysis. Most would like to spend more time functioning as professional economists but the demands of their government jobs reduce the time available to devote to economic research or extended analysis of an economic problem. They have time to read analysis done by others and discuss its implications for economic policy. While there are many good economists outside government, some high level economists have migrated to other countries because of the shortage of professional economist positions in Zambia.

To improve the quality of economic analysis available to government, we must:

- assist government economists to understand how good analysis will improve decision making, how to (a) formulate, prioritize and select analytic problems, (b) write scopes of work, (c) monitor the work done by outside economists and (d) recognize what is good analysis;
- improve the knowledge of senior decision makers as to why they need good economic analysis before making policy decisions;
- strengthen non-governmental economic think tanks to function effectively;
- strengthen the research capability of non-governmental economists; and
- entice Zambian economists who have emigrated to return.

The proposed work is designed to complement the work of other donors to strengthen government's economic analysis. PEMFA, the Public Expenditure Monitoring and Financial Accountability program, was developed as a vehicle whereby a number of donors jointly fund activities to strengthen Zambia's budgeting and planning system. The World Bank and DFID are the lead donors. This will help develop a macro-economic forecasting model and also improve the quality of economic statistics. The proposed USAID work will assist in ensuring that the model is widely used. Further, some of the analysis to be funded under the USAID work will improve future expansions of the PEMFA-assisted models. It is possible that USAID will be asked to fund the development of models that look in depth at a single sector of the economy and can improve future iterations of the macro-model. The USAID-funded analysis will be strengthened by having linkages to a national macro-economic model, and in time the national model can be strengthened by the inclusion of the analysis done in the sectoral models. A fuller comparison on the proposed USAID program and PEMFA is in Annex D.

## A: Improved Economic Analysis

**The Need:** Econometric models are useful in improving planning and budgeting and are vital to improving the quality of analysis. They will have a serious problem because of the quality of data in Zambia. It will be difficult in a number of instances to have sufficient data points for confidence in some of the equations in a macro-economic model. The aphorism of "garbage in, garbage out" is an extreme statement, but the lack of sufficient quality in the macro-economic analysis acts as an obstacle. It is for this reason that improvement in data is also required (and is discussed in Annex B).

Econometric models are neither necessary nor sufficient to improve economic analysis within National Planning. They are not a substitute for good economic analysis although such models improve the quality of the analysis. Much can be done to improve the quality of economic analysis without a macro-economic model: for example, cross-sectional (survey) data can ground such analysis in reality.

**What is it?** Sectoral models enhance our knowledge of the economy and improve economic policy decision making. Cost-benefit or cost-effectiveness analysis does not make as many demands on data as macro-economic models. For example, analysis of the economic impact of HIV/AIDS or fertilizer subsides would be improved by a good macro-economic or CGE model but useful analysis can be done through sectoral models without using a macro-level model. If such analysis is done well it will enhance future CGE or macro-economic models. Existing data, possibly supplemented by 2007's expanded post-harvest survey are sufficient to assess the effect of large fertilizer subsidies or government's approach to maize prices. The existing MSU contract has the skills to expand their evaluation of the impact of current and proposed policy. Their analysis will be enhanced when PEMFA's macro-economic model is completed, assuming it has some behavioral equations for the agricultural private sector.

In addition, as the basic PEMFA-sponsored macro-economic forecasting model becomes operational, work could be done to add additional modules that improve its ability to forecast specific problems and enhance its ability to understand the impact of economic policy changes or external shocks. For example, a module can be added that will expand on stand-alone analysis of the costs and benefits of anti-retroviral treatment to get at the macro-economic impact of such treatment (and whether it is cost effective). Analysis of the impact of different types of educational or health expenditures that use cross sectional data can later be added to macro-models.

**Bank of Zambia model:** A model that forecasts inflation could be developed now with the Bank of Zambia to help them understand the nature of the problem and what policy variables are most likely to be effective in dealing with inflation. Such a model would be useful if the Bank decides to move toward inflation targeting. At present the IMF is recommending against such a focus, but doing the analysis now will improve the Bank's ability to influence policy and permit a smooth transition to inflation targeting later. Similarly analysis of the determinates of the foreign exchange rate could assist the Bank of Zambia in maintaining an accurate and reasonably stable foreign exchange rate. As in the previous section, such knowledge can be added to the macro-model later. Usually models designed for central banks have to be developed separately from publicly available macro-economic models. Central banks seldom want their models and forecasts to be made public before they are ready to disclose their analysis and policy. At the same time, there are positive policy implications in the public knowing that the Bank is analyzing inflation or foreign exchange rate's instability.

**Non-model work:** Most quality economic work does not require macro-economic or CGE models. Analysis of business decision making, of the structure of different economic sectors, of consumer behavior or comparisons of different policy options, can be done through a methodical use of the tools of economic theory at the so-called partial equilibrium level (rather than at the general equilibrium level dealt with by the macro-models). Cost benefit or cost effectiveness analysis is essentially just a weighing of different policy options, or of different ways of using financial resources. Analysis of what are the most cost effective ways of delivering HIV/AIDS drugs, or counseling can be done without large formal models (although they can be strengthened if such models are available). Analysis of the impact of different approaches to teaching can also be done without formal macro models.

The lack of adequate data reduces the validity of macro models, but places a premium on doing limited survey work to understand the likely impacts of alternative economic policy options. Limited surveys of the informal sector can assist in identifying the problems being faced and the policies that might be effective in strengthening these enterprises. Surveys of smallholder farmers can help in understanding whether roads, market facilities, credit, lack of inputs, or transportation are some priority problems that need addressing.

**Zambia and Econometric Models:** There have been CGE models created for Zambia and these have been used successfully in analyzing policy options. However, current senior economists did not feel that Zambians were adequately involved in the creation or use of those models. In any case, the Zambians who were involved with using those models are no longer active in government, and those who are active are antipathetic to CGE models. PEMFA will develop a macro-economic forecasting model and also anticipate creating Input-Output Matrices and a Social Accounting Matrix, both of which can form the base for a future CGE model. The shortage of government economists suggest it would be better to focus work with government on the development of a single macro-economic forecasting model as PEMFA is proposing. Government might want to work through a non-governmental think tank, which may want to use the IO and SAM from the PEMFA-supported work to develop, in Zambia, a CGE model. Having this developed in-country, possibly with foreign assistance, would provide National Planning officials and non-governmental researchers access to a tool that can improve analysis of policy alternatives. Government can request in-country people to then use the model for specific simulations.

**Quality of professional economists to do the work:** The quality of Zambian economists means that they can do much of this analysis, and that which they cannot do, can be done through foreign-Zambian collaboration of economists. Pairing foreign economists with Zambian economists will lessen future need for foreign economists and help make improved economic analysis sustainable.

**Strengthening economic think tanks:** Earlier efforts to improve economic analysis floundered because government officials who were trained did not have the time to do economic analysis as they had other work demands. In addition, the total remuneration package for such officials were better outside line ministries thus leading to an exodus to the Bank of Zambia, Zambia Revenue Authority, the private sector, donors and NGOs. There are many good economists outside government but only a few are functioning as professional analysts. With the creation of demand for good analysis some of these people may decide to return to being professional economists. In addition, some who have emigrated may decide that there are now good professional positions in Zambia and return.

There are few non-governmental think-tanks in Zambia but there are many economists capable of doing the needed analysis. The analysis probably cannot be sustainable within government offices because of the general shortage of analytical staff, except for the Bank of Zambia. This is not necessarily bad as government officials need to understand the problems and use analysis, they have to understand what good analysis is, but they do not have to do the analysis themselves. This requires a model where the government request the analysis of specific issues, and the analysis is then undertaken outside of government by a policy research agency, or specialist consultants.

**ZIPRA:** Recently an approach has been developed in Zambia that may bear fruit. An external think tank outside government is to be established in December 2006 by the African Capacity Development Foundation (ACBF) with the Ministries of Finance and National Planning and the Ministry of Trade, Industry and Commerce. ZIPRA (Zambian Institute for Policy Research and Analysis) will have government, private sector, donor and senior economists on its Steering Committee but be run through a Technical Committee outside government. The Steering Committee will establish the rules under which government offices can access the $1.5m of ACBF and $0.6m of GRZ money currently available to ZIPRA. Norway is considering contributing money to ZIPRA.

What makes ZIPRA particularly interesting is that it can contract for the research quickly outside the government's slow tendering process, it can do analysis independently from specific government requests when the Technical Committee views that there is a need for independent analysis, and ZIPRA will be able to accept funds and commissions from other institutions. This ought to improve the use of economic analysis by the private sector and provide a way for professional economists to survive outside the of central government. The lack of private economic consulting companies has resulted in economists who have advanced degrees being unable to be full-time analytical economists. ZIPRA can provide a way for government officials to get answers that can then feed into the decision making process.

There is a legitimate concern within some government offices that ZIPRA, and indeed potential USAID support to non-governmental economic think tanks, may further entice good economists to leave government service.

**Operation Modalities:** It is recommended that USAID finance a field a Long Term Technical Advisor for 12-18 months who would be responsible for working with government's economic offices to develop initial researchable ideas. This person will require research skills in applied economies plus knowledge of a specific area of potential interest to the government. S/he will assist the researchers to improve their analytical methods and help strengthen the operation of economic think tanks while engaging in some of the economic analysis.

This on-going work will be critical in helping government offices to think about their problems; to ask the questions which professional economists can help answer. The contractor will need to convince government economists of the need for good analysis and create demand for this analysis.

Government's economic offices will constitute an intra-governmental "Oversight Committee" to ensure coordination and collaboration between offices. This committee will establish operational procedures and indicative budgets for the first six months. It will also decide how a technical committee of researchers will be established to oversee day-to-day work.

The Long Term Technical Advisor (LTTA) will advertise for economic think tanks or economic professionals who are interested in participating in the program. After reviewing the responses with the oversight committee a roster of researchers will be developed. The LTTA may initially assist government offices to write Scopes of Work and will then use the roster as a quick way to compete for local economists to undertake the approved work. The client government office will approve all people selected to do the work for them. The LTTA will be expected to assure quality, help with research methodology and with the establishment of economic think tanks.

If ZIPRA has been established, then it will be eligible to respond to the RFQ and be selected as an economic think tank under this program. It is possible that USAID and the Oversight Committee will decide to use the same mechanisms as under ZIPRA.

It is recommended that the LTTA explore the possibility of linking Zambian economic think tanks with comparable think tanks in the region (e.g. Botswana Institute for Development Policy Analysis and the Macroeconomic and Financial Management Institute) and that the research would benefit from including regional researchers through disseminating best practice research methodology. An additional advantage of this type of linkage is that Zambia can learn from comparable work done elsewhere.

Other aspects of the work include:

- regular seminars on economic analysis for government technicians; in-progress and final presentations on the results of analysis;
- help in disseminating the results to the mass media;
- short summaries of the results for senior policy makers (the oversight committee might want that there also be an outreach to the economic committees in parliament);
- establishing a periodic economic round table to discuss the economy and specific issues; and
- help establish data user groups to work with the Central Statistical Office to improve economic data.

**Buy-ins:** In the interest of helping research become self-sustaining, there will need to be a mechanism whereby other funding organizations or other users of research can buy into the program. It is hoped that private business will commission some studies and government offices may commission work separate from the USAID-funded work. This should be encouraged.

**Leadership Research:** There will be times when government officials do not think of the need for specific work but a researcher sees a problem developing that needs analysis. Thus, there has to be a mechanism whereby research can be approved even without a government client. While this will not be the norm, it is essential. In some cases this might be simply doing an analysis of existing policy that might suggest an alternative way to solve the problem. The Oversight Committee will need to allocate some funds to be used at the discretion of the Technical Committee for this purpose.

**Ownership:** All documents are public documents, but a commissioning government office may request that the results remain confidential for a limited time. All work should be available to the general professional economics community within a reasonable period of time to allow for the broader research and policy community to comment on the work and for disseminating the findings to a wide audience and ensuring Knowledge for Development.

## B: Computer Hardware and Software Needs

The focus of the USAID work is on research by non-governmental organizations. In strengthening them the emphasis will be on research methodology and survey techniques. However, it is expected that some research organizations will need computer hardware and software. This will not be a major expense, but funds need to be available. Any purchases will follow standard USAID Procurement Guidelines. For the purposes of the budget we have made the following estimates: Eight packages of $5000 each. Consisting of Computers at $1500 each, printers at $500, and statistical software, at $3000.

## C: Training

There will be many different forms of training in this program, but all will be in-country:

- training for government technicians on statistical and survey methodology;
- one-on-one work with non-governmental economists on research methodology;
- training for government decision makers, and possibly for parliamentarians; and
- survey design training.

It is anticipated that existing university staff may carry out the bulk of the training with inputs from the LTTA and possibly some external regional/international STTA. The courses will need to be modular to accommodate the participants regular work commitments.

## D: Time line

| | |
|---|---|
| December 2006: | Provision of draft proposal to USAID/Zambia |
| January 2007: | Submission of Final Report |
| Late January/February 2007: | USAID Finalize SOW for LTTA |
| April 2007: | Tentative Start Date for LTTA |

## E: Illustrative Budget

| | | | |
|---|---|---|---|
| LTTA /COP | months in contract | 18 | $417,960 |
| | fully burdened daily rate | 1,080 | |
| Sub Total Allowances | | | $162,270 |
| | | | |
| Travel Transportation and Other Direct Costs | | 3,000 | $18,000 |
| office space | monthly rent, with utilities | 1,550 | $27,900 |
| Computer Hardware and Software | number of packages | 8 | $40,000 |
| | cost per package | 5,000 | |
| Training | | | $100,000 |
| Research Activities | number of research activities | 10 | $500,000 |
| | cost per research activity | 50,000 | |
| Support to economic think tanks | | | $50,000 |
| General and Administrative Costs | | | $161,670 |
| **TOTAL** | | | **$1,477,800** |

If government provides office space this will reduce the line item for office space although some funds will need to be retained for communications between the COP and contractors main office. In these annexes is additional information on the importance of economic models and how they have been used in Zambia. In addition a number of analytical constructs are provided to help explain the relationship of policy, research and impact.

# Annex A: Economic Models and Analytic Work

Essentially, there are three types of economic analyses needed for public finance management, particularly for the formulation of policy applied to annual budget elaboration and medium-term budget planning:

1 Macro models: the macroeconomic time series model and multi-sector comparative statics models (such as CGE and I-O);
2 Micro models and analysis: cost-benefit analysis supported by sector models and other analytic work;
3 Macro- and micro-models combined: detailed sector models and analysis linked to, or derived from, the macro models.

## 1. Macro models

### *The macroeconomic time series model*

The MEM (macroeconomic time series model) is a powerful analytical tool, useful in many activities:

1. Analysis of the structure of the national economy and its changes over time
2. Project appraisal, such as impact analysis for specific and substantial capital investments
3. Comparative assessment of alternative policy scenarios (an opportunity cost approach)
4. Provision of quantitative support for budget allocations, used in budget debates within the government and at the stage of budget draft dissemination and public dialog
5. Construction of plans, such as the MTEF (medium-term expenditure framework)
6. Forecasting (social, economic, fiscal, etc.)
7. Ex-post evaluation/benchmarking of budget performance in different sectors of the economy
8. Training and education, studying complex relationships between different variables in a national economy
9. Improvements in coverage and quality of national statistics, particularly national accounts, and of diverse social and economic indicators; (MEM checks out and creates demand for data internal consistency and comparability/compatibility, specifically over time, as well as for solid data documentation necessary for construction of a multi-sector time-series model)
10. Other diverse analytic efforts, for which a MEM provides base/benchmark figures
11. Enhancement of the “international image” of a country, its statistics and its economy

This is still an incomplete list of applications for a MEM. Since all advanced nations construct and use macroeconomic models of their economies, the lack of such a model downgrades reputation of a country. Such a country is perceived as “unsophisticated” and indirectly affects investment and trade decisions.

An advanced modeling system creates demand for comprehensive good data coverage and stimulates national statistics organizations to extend and improve their information, which otherwise may remain a supply-driven (low profile) activity. There is a powerful feedback between good data and good analytic/modeling activities. They are mutually motivating, enabling, stimulating, and reinforcing. Construction of large time-series model reveals gaps in data collection, availability, and dissemination. It helps to identify and remove the

incompatibilities and inconsistencies in statistical data by subjecting them to a system of rigorous model equations. Usually the MEM comes with a database which includes both inputs to the models (reconciled, well organized and documented data) and model outputs (results of different model applications). As such, it turns into a data library, useful for many purposes, including international analyses undertaken worldwide. The international ratings and rankings help both internal policymaking as well as boosting country's international recognition.

The use of a macro model provides many insights into a national economy, its economic structure and dynamics over time. In this context an assessment of past and current policies may be undertaken and recommendations for policy improvements may be formulated. If the model suggests trends of distortion over time which are linked to specific policies, corrective actions may be recommended. In general, a good MEM improves policies and budgets. It provides quantitative ("more objective") fundamentals for policymaking. As such, it reduces the level of policy "politization" and increases its emancipation vis-à-vis powerful vested interests. The whole budget process becomes better informed, more transparent, and less arbitrary.

A good modeling tool can be used to appraise and assess stand-alone projects and overall policies in different areas. This evaluation could be done *ex-ante*, during the formulation of policies, plans, MTEFs, and budget drafts, as well as *ex-post*, as a base for monitoring benchmarks and performance evaluation. Hence the MEM helps enforce fiscal accountability and provides useful information for formulation of future policies and budgets. The applicability of a good MEM extends toward local governments and NGOs, as well as donor-funded activities, for which it provides useful information, helps assessing effectiveness and efficiency of CP assistance and designing future aid projects. Without a good modeling framework, the government and cooperating partners lack operational instruments for allocating funds and evaluating their activities. The MEM delivers a "big picture". It enables assess concrete, in most cases micro-level projects, from the perspective of a macro-level economy and a country's long-term development.

MEM is also a convenient educational tool. It helps learning about the economy and policies, improves understanding of indirect and long-term policy outcomes, and experiments with alternative measures and scenarios. It becomes a base for studies and research in governmental agencies as well as supports schooling and think-tanks.

***The CGE (Computable General Equilibrium) Model***

Most of our remarks related to the MEM would apply to a CGE model as well as to its simpler alternatives (which are also its building blocks): integrated systems of national account balances augmented by satellite accounts, flow of funds models, input-output models and their extensions, and the SAMs (social accounting matrices). There are however significant differences, or trade-offs, between the MEM and the CGE model:

1. While the MEM is a time-series model and extends over a longer period of time, a CGE is a comparative statics model, and each of its runs is limited to one point in time or one time period (one year).
2. To stay operational, in most cases the MEM remains highly aggregated, limited only to a few sectors. The CGE model may easily incorporate a very large number of sectors, one hundred or more, but no changes over time are internalized in its structure.
3. The CGE potentially could be constructed based on the results of a one-time data collection effort for a given point in time. Most importantly, this data does not have to be reconciled with the corresponding figures for other periods. Hence the feasibility of a CGE model is less restricted than in the case of a time series model which requires a number of

mutually compatible data points over a longer period of time. Obviously many figures for past periods may not be made available unless they had been collected in the past.

4. On the other hand, the MEM needs relatively standard national statistics aggregates while a CGE, among other things, needs data on price/quantity elasticities which in most cases are not available and must be estimated/approximated based on scarce evidence.
5. Unlike the MEM, the CGE model is not designed for forecasting and as such is not well suited for the needs of long-term national planning and medium term fiscal forecasts. Its usefulness in capital planning and budgeting is limited, since it lacks capability for tracing effects of changes in economic factors (labor, capital, natural resources, etc.), which is needed for large investment projects. The CGE model is essentially based on a market equilibrium assumption (for which, among other things, a well functioning market and its institutions are necessary). In many emerging market economies this is a strong assumption, significantly limiting applicability of CGEs to real world economic policy issues.
6. A standard application of the CGE is a short-term (static) impact analysis, i.e., evaluation of an overall effect of an "external shock" (or a specific policy measure) to an economic system. Usually, a CGE is built around main institutional sectors (the firms, the households, the government, the NGOs, the foreign sector and the financial institutions) which could be easily disaggregated into a large number of sub-categories (factors, products, activities, financial assets, etc.). Its structure is conveniently compatible with the SNA-93 national accounts (United Nations' sponsored standards for economic statistics).
7. A CGE model is also well suited for studying different kinds of externalities (related to employment, income, health, environmental impact, etc.), which could be internalized into the model's structure in a relatively straightforward way. Since no time series are needed, in most cases the data for these analyses can be relatively easily collected.
8. Overall a CGE model and its results may be more difficult to comprehend than MEM. It seems that MEM needs a shorter training time then CGE.

## 2. Cost-benefit analysis and sector models

In this type of analysis, the analyst focuses upon specific problems limited to one area of policymaking, one sub-sector, or one project. While within such an analytic effort some considerations of a larger impact and feedback effects with other sectors or projects may be considered, they are not supported by a rigorous quantitative analysis. Examples of this kind of analytic work would include:

- calculation of effectiveness of expenditure on healthcare, education, and agricultural subsidies
- effect of a free economic zone on foreign trade
- relationship between money supply and inflation
- effects of inflation on poverty

In the following table we attempt to summarize the main trade-offs between macro models and sector/micro analysis. Our assessments are rough and highly simplified. They reflect a tendency, or average cases and do not necessarily apply to all macro models and sector models.

| Models' features | Macro models | Sector models |
|---|---|---|
| Cost | High | Low |
| Data needs | Large | Small |
| Complexity | High | Low |
| Time to develop | Long | Short |
| Capacity of local staff to do the analysis and to apply its results | Low | High |
| Training of local staff | Extensive training needed during both model creation and model applications, over a long period of time | Less training is needed |
| Learning of economics and economic policy | Substantial | Limited |
| Arbitrariness | High; needs of strong assumptions on which models are based | Low |
| Empirical verification/falsification | Difficult or impossible | Easy |
| Empirical applicability | Broad | Narrow |
| Applicability to inter-sector large scale comparative studies | High | Low |
| Applicability to intra-sector detailed comparative studies | Low | High |
| Applicability to ad-hoc studies of urgent concrete problems | Low | High |
| Sustainability | Low; many models remain at initial stages of development and their life span is short | High; methods used in sector models are easily replicated |
| Understanding by policymakers | Low | High |
| Need for specialized software | Substantial | Limited |
| Accounting for indirect effects, long-term effects and feedbacks | Considerable | Limited |
| Accuracy of results: short term | Low – due to problems with data, theory, and assumptions | High |
| Accuracy of results: long term | High – data mistakes tend to cancel out over a longer period of time | Low – due to absence of indirect relationships and long term feedbacks |
| Risk of failure | High – many large models are not finished, are based on erroneous assumptions, bad data and/or "user unfriendly"; involve expensive studies and are not used to solve real world policy problems | Low |

### 3. Macro- and micro-models combined

While both macro-models and sector models alone suffer from many shortcomings and should be viewed as "second best" solutions to policy analysis needs, the combination of the two categories of models is the best way to go. Its main deficiency is the high cost, long time, substantial data requirements, high complexity and high risk of failure.

## B. Models in Zambia

While to the best of our knowledge no comprehensive MEM for Zambia has been built thus far, there have been several attempts to build Zambia's SAMs and CGE models.

In particular, an I-O/SAM/CGE system was built in 1996-97 by Oxford University's team in collaboration with the Ministry of Finance and Economic Development. The CGE model was based on a large 1995 I-O/SAM. It was written in GAMS (General Algebraic Modeling System). It consisted of 383 equations. The SAM and CGE models were used, among other things, to simulate impact on the Zambian economy of:

- Debt relief
- Trade liberalization
- ASIP (Agricultural Sector Investment Program)
- Reductions in donor funds
- Improvements in domestic investors' confidence
- Changes in terms of trade for mining products
- Improvements in mining sector's productivity

Apparently, during the last few years, there have been several other attempts to build and use the SAM/CGE model for Zambia, but no detailed information has been found. In general, these models have been short lived and currently are not used by MoFNP for its policy needs.

The sector models are not in wide use in Zambia. A think tank which was created in the MoFNP in the 1990s intended to serve as a policy analysis unit within the Ministry, failed to produce useful output and was dissolved in 2000. Currently there is no significant analytic capacity within the Ministry. Some capacity exists in the Bank of Zambia, where a number of ambitious research papers have recently been produced, covering such issues as:

- monetary policy transmission
- food and non-food inflation
- nominal anchor for inflation
- impact of high copper prices on the Zambian economy

The analytical work presented in these papers is of a high professional quality. Yet, these research efforts had to use imperfect data, lacked any large macroeconomic model, on which they could base their analyses, and were viewed more as academic exercises rather than applied research studies to be used in Zambia's policies.

## C. Recommendations

For Zambia construction of a large MEM under the auspices of the MoFNP will provide an opportunity for a major upgrade of its policymaking and donor funds' allocation, which account for up to 20 percent of Zambia's GNI (gross national income). The work being done by PEMFA to create a macro-economic model is essential to improved analysis.

Such a model will have a potential for being used in many ways, including providing support to training and education within the MoFNP and other governmental agencies, in particular the Bank of Zambia and the Central Statistical Office. It will create demand for better statistics and provide opportunity for analytic work.

Yet, given recent major transformations of Zambia's economy, along with large shifts in world commodity prices (such as in copper) and the limited availability and uncertain quality of Zambia's economic statistics, construction of a useful macroeconomic quarterly time series model might not be possible within a short period of time. Large structural changes of the economy make a longer time series not a particularly useful tool for impact analysis and forecasting. Short-term time series in turn suffer from well known problems related to a low degree of freedom and high standard errors of their coefficients/parameters.

There are only a few time points for household income and consumption data: 1994, 1998 and 2004. Sampling methods of all these surveys are deficient. The register of enterprises is out of date. No system that would follow changes in the enterprise sector is in place. No reliable investment data are available. There are major problems with the balance of payment data, including the lack of reliable data on diverse CP activities and on private remittances. There is a large informal economy that is not well documented by the CSO's statistics. Producing a quarterly time series over a longer period of time would require a lot of ingenuity. Initially the model will have to be confined to a rough approximation with limited practical capabilities.

Several years may be needed before this model becomes fully operational, based on reasonably accurate and complete data, used by competent policy analysts to provide right answers to meaningful questions asked by well informed policymakers. The experience with previous modeling initiatives (in particular, with the Zambia SAMs and CGE models) is not encouraging. The weak local ownership of modeling tools, insufficient capacity building and lack of long-term support for models' maintenance and help with applications to concrete policy problems seem to be main factors for models' short life spans.

A study intended to be commissioned by PEMFA will include the compilation of Zambia's I-O tables (supply and use) and a SAM. These matrices will be produced based on data collected by a large economic survey planned to be undertaken in 2007. Given the time necessary to arrange and run such a large survey, data coding and recoding (adjustments), compilation of large multi-sector tables, their test applications, staff training, further fine tuning and reconciling, this is likely to be a longer-term effort. No CGE modeling effort is intended by PEMFA at this moment.

## Annex B: Improved Data Collection

The last fifteen years in Zambia have been a time of change—political change to multi-party democracy and economic change to a market economy. Having mostly completed this phase, now Zambia is getting ready to enter a new phase—of sustained economic development. Zambia's challenge is to build institutions and craft policies necessary for creating long-term, sustainable growth and improving living standards while abating poverty and protecting natural environment. Over the next ten-to-twenty years, Zambia seeks to develop from the initial starting point as a low-income country with a state-run economy to a medium-income country with a competitive market economy, increasingly higher levels of income for the population, declining share of people living in poverty, and thoroughly preserved natural environment and cultural heritage.

In Zambia and other emerging market countries, a good policy involves efforts to enforce consistency, transparency and accountability while increasing the foreign aid "absorption capacity". Continuous improvements in policymaking ought to be supported by critical quantitative analyses that present the advantages and disadvantages (the opportunity cost) of various policy options, taking into consideration economic theory and international best practices. Good economic data are necessary for good analytical work and good policies.

**The problem:** In Zambia, most of policymaking has been based on intuitions and convictions of the country's policymakers and their advisors. Information available to them was quite limited. Reliable comprehensive economic data was not available. Once the economy becomes more complex and operates at a higher level of development, the demand for good analysis and detailed economic statistics is rapidly increasing along with a fast increase in the capacity of the Government to do informed policymaking rather than an "ad-hoc" policymaking previously practiced. Among other things, in order to take full advantage of the aid Zambia continues receiving from international donors along with significant foreign investment and inflows of large amounts of foreign-earned remittances, reliable social and economic data and their analysis is in high demand and this demand will continue growing.

| | | |
|---|---|---|
| POST-COLONIAL PHASE | ➔ | SUSTAINED DEVELOPMENT PHASE |
| (Ad-hoc policymaking) | | (Well-informed policymaking) |

While some of the Zambian official statistics, as compiled and published by the Central Statistics Office (CSO), are of relatively good quality (such as data on population living conditions), most of CSO data do not provide reliable and internally consistent information needed for analytical purposes and policymaking. More efforts are needed in order to improve methods of data collection, processing, and integration as well as their availability, presentation and documentation. A serious drawback is incompleteness of the national accounts. There is a large segment of the economy that, for different reasons, is not adequately covered by the official statistics (e.g., non-monetary incomes, foreign direct investment, portfolio investment, most of informal economy, and foreign trade of services). The available data often lack detail, are not reconciled, and are not supported by solid documentation that would enable their useful applications. In fact a full coherence of national macro-statistics is not possible, because of the "white spots" in data coverage and idiosyncrasies in data collection and compilation.

**Role of the CSO:** The list of the "things to do" for the CSO is long and includes:

- drafts of legislative and regulatory amendments leading to the establishment of an autonomous CSO
- improvements in coordination among governmental agencies of collection, compilation and dissemination of economic statistics, including collaboration with the Bank of Zambia on the balance of payments data
- improvements and simplification of questionnaires used in economic surveys, increased frequency of several surveys (in particular the enterprise survey and household budget survey), improvements in sampling procedures
- re-basing national accounts and updating many benchmarks (most benchmarks for national accounts are out of data, e.g., the benchmark for the index of industrial production uses the 1980 data)
- extending the coverage of national accounts (a large number of formal enterprises and most informal activities are not currently included in national accounts)
- updating and adjustments of the current classification system (of industries, establishments, consumption, etc.)
- creation of a database covering NGOs, donors and donor grants

**Main 2007 data collection projects:** Among other things, in 2007 two large surveys will be undertaken: (1) Economic Census, and (2) Extended Post-Harvest Survey.

**1. Economic Census**

Economic census will be used to update and improve national accounts, including the calculation of GDP. It is intended to cover all establishments with 5+ employees and a 10% sample of small firms (1-4 employees). The results of this census will be used to create or re-base many indicators, including:

- Quarterly GDP (provincial and national)
- Index of Industrial Production
- Producer Price Index
- National accounts, including Tourism Satellite Account, and
- Input-Output supply and use tables and Social Accounting Matrix

**2. Extended Post-Harvest Survey (PHS)**

The EPHS is intended to collect data on all forms of agricultural activities, including those which are currently only partly covered or not covered at all.

Data collected by previous annual PHS included:

- areas under individual crops
- gross output, sales and income from sales
- purchase and use of inputs
- capital formation
- access to loans

Additional data to be collected by the EPHS in 2007:

- urban poultry production
- output of fish farms
- output of horticulture and floriculture activities

The EPHS is intended to use a sample of 40,000 households, which will be four times larger than the samples used in the past.

Both surveys will provide data of great importance for national accounts and other economic statistics. Field data work for these surveys is expected to take about five months. At this moment it is difficult to know when exactly these surveys will be run. Donor support for these two surveys is needed in order to help secure good data quality and CSO capacity development. In particular, donors' involvement into data collection and coding will enable creation of a database to be used in different analytic projects.

**Proposed Work:** If current timetables are adhered to, then the economic census will have been completed by the time the USAID contractor is selected. PEMFA plans to help with the analysis of the results of the economic census. There is a need for help to improve the quality and use of the expanded PHS and much of this might be doable under a separate USAID project with MSU. To the extent that is not possible then the "Improving Economic Analysis" Project should be able to provide expertise in survey methodology, questionnaire design and also help with the analysis of the resulting data.

# Annex C: Zambia Policymaking Network

**Policy making network**

Policymaking is affected by, as well as affects, many components of a national economy. The fresh experience from providing foreign assistance to emerging market countries suggests that a balanced development strategy (or good coordination and right sequencing) of foreign aid is of great importance. Over-assisting certain blocks of the economy while under-assisting others, generates bottlenecks, diminishing the effectiveness and efficiency of the assistance as a whole. A “big picture” approach, enabling consideration of direct and indirect effects of aid (a sort of aid “qualitative multiplier” analysis) and a systematic search of the bottlenecks, is helpful in allocating aid funds.

In order to make formal decisions in the area of policymaking capacity development, one should analyze in a systematic way the main building blocks of the policymaking activity network and identify its weakest links requiring assistance. While support may be needed everywhere within the network, one should be able to formulate priorities and address the most urgent or the most important needs that would have the largest effect on the performance of the entire system.

In this kind of analysis it is important to recognize and apply a number of important concepts and principles related to: opportunity cost, network economies, weakest links, diminishing returns, feedback relationships, demand driven activities, policy ownership, activity continuity/sustainability (enabled by a long term support rather than short-term action ending with delivery of a product), etc.

A flowchart presented below displays important building blocks involved in policymaking. The arrows reflect the relationships between these blocks, showing the predominant direction of causality. They reveal which block’s outputs are needed/demanded by which block activities. The network’s endogenous impacts are assumed to be demand driven: people (civil society) require good policymaking outcomes: improvements in living standards, reduction of poverty, and economic growth; this, in turn, creates demand for good policies, which need well performing public finance, solid data collection, and in-depth analytical work. All of these activities are enabled by appropriate institutional arrangements, the creation and performance of which depends upon the quality of policies and strength of civil society.

To calculate the quantitative measures to these demand-supply causalities, one could estimate the total effect of different CP (cooperating partner) interventions in this system by means of a multiplier model, taking into account not only direct effects of CP activities, i.e., improvements generated in a specific block or sector, but also indirect effects stimulated by these improvements in other parts of this system. For example, efforts in upgrading a country’s policies create demand for better institutions, better data and better analysis which endogenously motivate/stimulate development of these blocks. If so, the total effect of policy improvements is much greater than in the policymaking block alone.

Given this structure a question becomes: Support for which of these blocks would generate the greatest total positive effect (direct and indirect) on the economy? In Zambia, ANALYSIS appears to be a good choice for such a block based upon the following reasons:

- capacity development support in this block has been relatively low and seemingly less effective than in other blocks

- endogenous development of analytical capacities without foreign help would be difficult and take considerable time
- ANALYSIS stimulates improvements in national statistics and institutional development while being a necessary condition for good policies needed for country's development

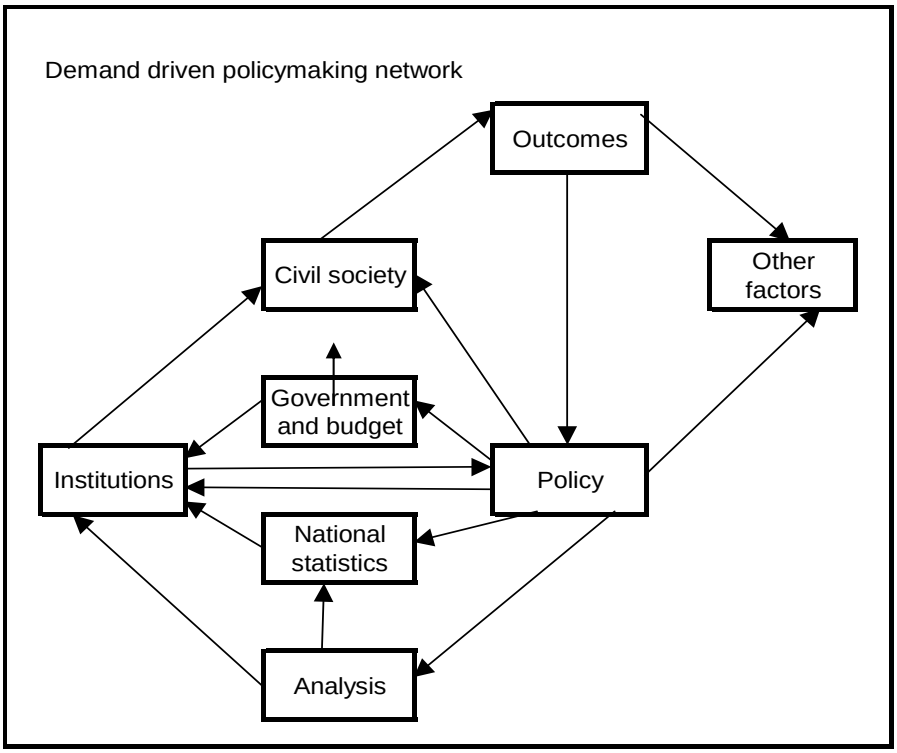
**Policymaking network building blocks:**

OUTCOMES
- improved living standards and reduced poverty
- macroeconomic stability
- economic growth
- good environmental management

These outcomes are demanded by a strong civil society. They need, or are enabled by:

OTHER FACTORS
such as
- propitious world market conditions (commodity prices, etc.)
- transfers of funds from the rest of the world (especially CP funds and private remittances), and
- favorable weather conditions

as well as by a good




POLICY
- social policy
- economic policy
- other policy

Good policy in turn is enabled by several factors:

CIVIL SOCIETY
- well educated voters
- strong NGOs

GOVERNMENT and BUDGET
with an
- effective fiscal transparency and accountability

supported by an
- operational monitoring and evaluation system

remaining under strong civil society controls and provided with a solid institutional support

NATIONAL STATISTICS
- providing detailed reliable, comprehensive, and well documented data
- consistent with the SNA-93 (UN-supported economic statistics standards)

and again strong institutions enabling and supporting data collection activities

ANALYSIS
including

- modeling
- other analytical policy support

enabled by an appropriate institutional framework as well as good statistics

INSTITUTIONS

- good legislation and regulations

demanded by an educated and active civil society and enabling/enabled by good policies

# Annex D: Comparative analysis of two model proposals: Possible USAID Support and PEMFA

There are similarities and differences between concepts presented in USAID's interest in modeling and the PEMFA macroeconomic model ToR.

The USAID/Zambia's interest lies with key policymaking requirements. As emphasized in the SoW, Zambia faces a number critical policy and budgetary issues, and the analytical capabilities of GRZ (including those of the Planning and Economic Management Department [PEMD] of the Ministry of Finance and National Planning [MoFNP]) remain constrained by a variety of factors.

Currently, policy is formulated by Sector Advisory Groups (health, education, agriculture, etc.). Each SAG is headed by permanent secretary of an appropriate line ministry. Members of each SAG are representatives of relevant line ministries, CPs, private sector and the NGOs. Planning documents produced by the SAGs are compiled into a Green Paper, which is assessed and approved by the Cabinet. Next it is disseminated through the media and debated by the NGOs and other non-governmental bodies. After accounting for the results of the public debate, the Cabinet produces a final document, based on which the Medium Term Expenditure Framework [MTEF} is drafted jointly by the Budget Department and Planning Department (PEMD), both of the MoFNP.

All participants within the process (the Cabinet, SAGs, MoFNP, and NGOs) lack capacity to undertake any more advanced analytical work. The macroeconomic policy is formulated based on the IMF's recommendations that are confined primarily to fiscal and monetary issues and lack any in-depth analysis of country's social and economic policies.

The possible USAID/Zambia support will alleviate this gap by focusing on the area of policymaking and budgetary capacity development. The potential assistance involves: economic analysis and developing analytic tools (econometric models, cost-benefit and other policy analysis techniques), improving data and computing capabilities.

The PEMFA's ToR is focused on limited help for the proposed economic census including rebasing of national accounts. PEMFA's work focuses on the development of a macro-economic behavioral model. This is an ambitious project, which will (1) undertake a large scale economic census; (2) "re-base" the national accounts system with the results of this census; (3) undertake other data collection and processing efforts; (4) use the rebased national accounts data and other statistics to construct a large quarterly macroeconomic econometric time-series model, along with an Input-Output model and SAM Model (Social Accounting Matrix); (5) test the models, train staff and begin using these models for policymaking needs. The timeframe for all these activities is ten months with the preliminary macro-economic model ready in six months.

While the potential assistance provided by USAID may be seen as short-term (immediate) support for policymaking and capacity building in this area, the PEMFA's project will be helpful in laying out foundations for a long-term advanced policymaking analysis capacities.

| Comparative table | Potential USAID Support | PEMFA: Public Expenditure Management and Financial Accountability |
|---|---|---|
| Document | Improving Economic Analysis at the Ministry of Finance and National Planning (MoFNP) | Terms of Reference for PEMFA Fiscal Policy and Economic Planning Component: Consultancy to develop a macroeconomic model for Zambia |
| Demand/request | USAID/Zambia is seeking technical assistance from USAID/SA to conduct a short-term technical assessment of the current modeling system and human analytical capabilities within the MoFNP.<br><br>The Secretary to the Treasury states that the Ministry is not using any model presently, but is attempting to provide budgetary guidance to senior policy makers.<br><br>Evaluating the gaps between the current system and the state of the art modeling tool and data for decision-making system envisaged in this project is the goal of the short-term technical assessment. | Government requires the services of a consulting firm with expertise in macroeconomic modeling to build the appropriate macroeconomic model, associated database, user guide and training materials. |
| Background | Currently, MoFNP policymakers have limited empirical means to predict the impact of governmental spending in a number of critical sectors, including: HIV/AIDS, education, agricultural subsidies, and health. For instance, MoFNP cannot state in any quantitative objective manner the economic benefit to society of putting secondary school teachers on ART. Such lack of knowledge about fundamental financial decisions could result in chronic deficits in the health- and education-related line items and in mis-allocations of activities within the economic ministries, such as agriculture, within the government's annual budget. | The government of …Zambia …is rolling out a far-reaching program of reforms that will improve the way in which public finances are managed, making better use of taxpayers' money and providing real benefits for citizens across the country. |

| Comparative table | Potential USAID Support | PEMFA: Public Expenditure Management and Financial Accountability |
|---|---|---|
| Overall Project's objective | To allow the MoFNP to allocate public expenditures in the social and economic sectors in a more rational manner so as to recommend to budget-setters the optimal positive impact on Zambia's economic and social development, while reducing poverty.<br><br>The project will allow the MoFNP to inform resource allocation decisions by predicting returns of, and trade-offs between, investments in social and productive sectors, seeking to maximize economic performance with an emphasis on poverty reduction.<br><br>The entire project will focus on sustainable solutions that can be utilized by MoFNP long after the project is completed. | Developing instruments that will facilitate the attainment of a policy-based planning and budgetary process that is able to facilitate the effective mobilization and allocation of resources in a systematic, effective, efficient and predictable manner.<br><br>The use of the instruments developed under the component will result in improved public expenditure management and fiscal accountability.<br><br>The component goal will be achieved by improving the quality of macroeconomic and fiscal frameworks used in preparation of annual budgets and medium-term planning documents (MTEF, NDP). |
| Modeling | The activity will include design and testing of the modeling tool, installation of the software system at the MoFNP, and training of key MoFNP staff in its use.<br><br>Technical assistance in design and implementation of the system will be primarily directed at the MoFNP using data from HIV/AIDS, education, health, economic growth and trade, and agriculture sectors.<br><br>Deliverables expected from the assessment: strategy and work-plan for developing the modeling system within the MoFNP | The consultant will:<br>- assist the CSO in re-basing the national accounts to 2006 and creating a quarterly setup<br>- develop a…quarterly behavioral macro econometric model of the Zambian economy that: (i) provides medium-term projections of major macroeconomic variables…and (ii) facilitates policy analysis by way of policy simulations…<br>- test the model, document the process and develop a user's guide |
| Input- Output model | This activity will utilize state-of-the-art economic and budget tools to create an input/output modeling system that will allow the MoFNP (in particular its Investment & Debt Management section) to conduct in-depth cost/benefit analyses for a broad array of social and economic spending categories. | The consultant will…construct the Input-Output/Supply and Use Tables, construct the Social Accounting Matrix, re-base the national accounts and create a quarterly setup. |

| Comparative table | Potential USAID Support | PEMFA: Public Expenditure Management and Financial Accountability |
|---|---|---|
| Training | As such, the entire design, development, installation, and training processes will incorporate and be led by MoFNP staff within the economic modeling and budget departments.<br><br>Training will be hands-on, beginning with initial scoping assessment to be completed in September 2006.<br><br>A further stage, pending availability of funds will develop capacity among leaders (president, ministers, and parliamentarians) to understand and interpret the results/outcome of the model. | The consultant will:<br>- Propose and implement an in-house training program with the objective of building capacity in maintaining and updating the model. The in-house training program should include step-by-step instructions of data collection, analysis, construction and updating of the database and behavioral equations and the model. The training program is expected to be implemented side by side with model development. The consultant is expected to provide trainers while trainees shall be five assigned officials from the MoFNP.<br><br>- Be providing training in re-basing national accounts to 12 statisticians from the CSO and three economists from the Planning and Economic Management Department of MoFNP.<br><br>- Work with the assigned officials to collect, analyze and construct quarterly historical data series linked to the new base year and to develop the macroeconomic model's behavioral equations…and test the model.<br><br>- Undertake the bulk of the assignment within Zambia so as to maximize capacity building. |
| Time frame | The expected timeframe from award to completion of the project is 18 months. | The duration of the contract will be 16 months.<br>The consultant should:<br>- be available to start this assignment immediately<br>- test the model and replicate the existing macroeconomic and fiscal frameworks within six months of the start of the assignment |

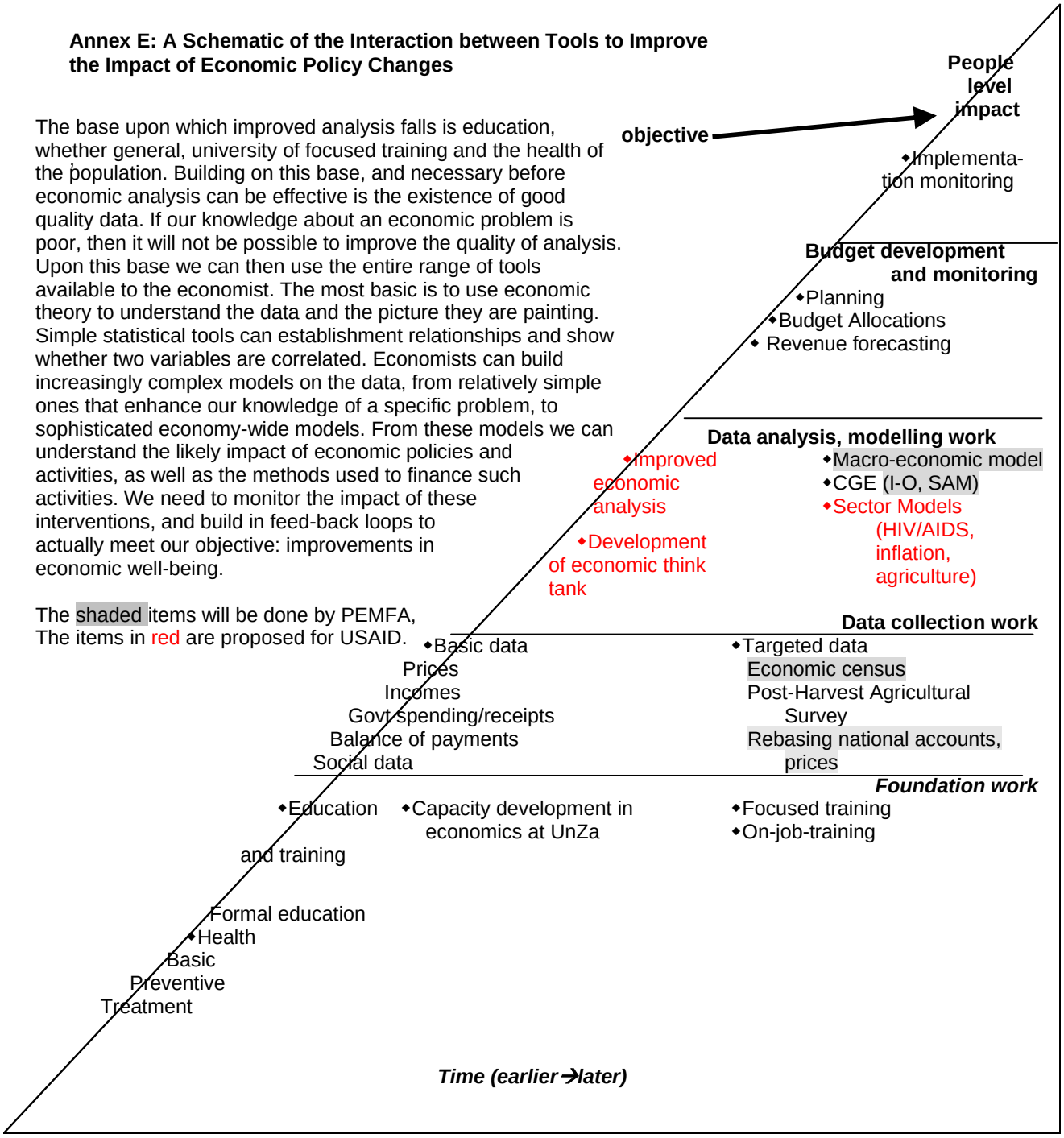
| Comparative table | Potential USAID Support | PEMFA: Public Expenditure Management and Financial Accountability |
|---|---|---|
| Broader context of the project | This overall project will be incorporated into a broader financial markets program within the AGCI program for Zambia. Segregating the various elements of this program will be finalized during the design of stage two of the project. | The PEMFA program will include development of an Integrated Financial Management Information System (IFMIS), development of a macroeconomic model, improved budget preparation, better cash release system, improved debt management strategy and systems, strengthened internal and external audit functions and enhanced parliamentary oversight and reform of the public procurement system. |
| Summary | Focus on:<br>1. Capacity building in the MoFNP<br>2. Simple model (Input-Output)<br>3. Use of the model and other tools for policymaking needs of the MoFNP<br>4. Application to concrete economic and social policymaking issues<br>5. Cost-benefit analysis; impact modeling of alternative budget expenditure | Focus on:<br>1. Capacity building in both CSO and MoFNP<br>2. Statistical data improvements and a set of integrated models (Input-Output, SAM, and macro-econometric quarterly time series)<br>3. Construction of database and model<br>4. Technical tasks in data collection, data compilation and model construction<br>5. Public finance management |

**Comment on the feasibility of Zambia's macroeconomic model**

Given recent major transformations of the Zambia's economy, along with large shifts in world commodity prices and the availability of Zambia's economic statistics, construction of a macroeconomic quarterly time series model will be a challenge. Large structural changes of the economy make a longer time series not a useful tool for impact analysis and forecasting. Short-term time series in turn suffer from limited degrees of freedom to be comfortable that the model is correctly specified. There will be high standard errors of their coefficients/parameters.

There are three time points for household income and consumption data: 1994, 1998 and 2004 with another planned for 2008. Sampling methods of all these surveys have had major problems. The register of enterprises is out of date. No system that would trace changes in the enterprise sector is in place. No reliable investment data are available. There are major problems with the balance of payment data, and a lack of reliable data on donor activities or private remittances. There is a large informal economy which is not well accounted for by the CSO's statistics. Producing a quarterly time series over a longer period of time will require ingenuity and its usefulness may be limited.

**Annex E: A Schematic of the Interaction between Tools to Improve the Impact of Economic Policy Changes**

The base upon which improved analysis falls is education, whether general, university of focused training and the health of the population. Building on this base, and necessary before economic analysis can be effective is the existence of good quality data. If our knowledge about an economic problem is poor, then it will not be possible to improve the quality of analysis. Upon this base we can then use the entire range of tools available to the economist. The most basic is to use economic theory to understand the data and the picture they are painting. Simple statistical tools can establishment relationships and show whether two variables are correlated. Economists can build increasingly complex models on the data, from relatively simple ones that enhance our knowledge of a specific problem, to sophisticated economy-wide models. From these models we can understand the likely impact of economic policies and activities, as well as the methods used to finance such activities. We need to monitor the impact of these interventions, and build in feed-back loops to actually meet our objective: improvements in economic well-being.

The shaded items will be done by PEMFA,
The items in red are proposed for USAID.