the thin blue line

Technical Report | July 2014
The Methodology and Results of the Cost of Sub-national Services Study (O&M)

National Economic & Fiscal Commission

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FOREWORD

The Thin Blue Line **has come to describe the cost of sub-national government services – the amount that needs to be spent year-on-year to breathe life into the government's service delivery machine.** The cost of services study is a cornerstone in the architecture supporting Papua New Guinea's journey toward properly funding the activities and administration that are necessarily located at the sub-national level.

In 2006 the National Economic & Fiscal Commission with valued support from DFAT (nee AusAID) completed the original costing exercise. It established for the first time what it would cost to fund the administrative and service delivery machinery that was located across the country in every province and district. The study looked at the recurrent operational and maintenance costs that were necessary to support the infrastructure and personnel that were already in place. These assets, both human and physical, represent a significant investment already made by our government and are two of the three critical components necessary to see the delivery of basic services. The third component is funding for operations and maintenance (O&M). O&M is the lifeblood that enables the human resources to conduct service delivery activities and maintains and operationalises the expensively constructed infrastructure.

The study did not attempt to answer the question of equity as it relates to the adequacy of infrastructural assets (such as the number of schools) and the adequacy of staff (such as the number of teachers) in a given province – that is another question for another day. What this study did seek to establish is the costs to deliver a standard set of basic services in every province in every district given the existing personnel and infrastructure. In doing so it sought to understand the cost relativities between the provinces as well as the specific costs in the sectors to inform the new system of intergovernmental finance, a system based on the principal of equity.

So, I trust you find this publication informative, it provides insight into the way the National Economic & Fiscal Commission approaches the task of establishing the cost of services that underpins the intergovernmental funding arrangements that have been in existence since 2009.

Hohora Suve
Chairman and CEO
National Economic and Fiscal Commission

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List of Terms and Definitions

Term	Definition
Administrative Overheads	Administrative overheads are costs necessary for operations but not directly associated with public administration and service delivery activities. They typically include the cost of; communications, utilities, stationery, office cleaning, office equipment, office furniture, building maintenance and fittings.
Basic education	Describes education at the primary, elementary and community school levels.
Capital expenditure	Describes spending to acquire or upgrade physical assets such as buildings, roads, and equipment.
Cost	In the context of this report ***cost*** refers to what we estimate it will cost not what we necessarily actually spend.
Cost of services study	Describes an NEFC study that estimated how much it costs to support service delivery within a province (health, education, etc….) on a district by district basis.
Goods & Services expenditure	A GoPNG term that refers to operational expenditure/costs. In our analysis goods & services excludes any personnel related expenditure.
Grants	Describes revenue that a province receives from the national government. Normally grants are provided to provinces for a specific purpose. Although some grants such as the block grant allow for provincial discretion on their use.
Internal revenue	Describes all sources of revenue that a province may receive other than national government grants and donor funds. The province makes its own decisions on how to allocate and spend the internal revenue it receives through the provincial budget.
Personnel emoluments expenditure	Describes expenditure that relates directly to staffing costs and includes; salaries, wages, allowances, retirement benefits and gratuities.
Project expenditure	Describes expenditure on a non-recurrent development activity, sometimes related to a project jointly funded by a donor partner.
Revenue (provincial)	Describes the money available to a province, both from national grants and internal revenue
Recurrent goods and services expenditure	Describes spending that is directed to purchasing the regular routine operational supplies and services, transport costs and routine maintenance of buildings. It does not include; personnel emoluments, capital and project costs.
Rural Health (services)	In this report the term rural health encompasses the network of health clinics and aid posts – but not primary care hospitals at the provincial capitals. It also includes the many support and enabling activities that happen to operationalise these rural facilities as well as the critical service delivery activities that emanate from the facilities.

Service delivery	Describes what the various arms of government actually do for the people of Papua New Guinea but more specifically it comprises a range of specific activities. Examples of services delivery activities include: In the area of health; it would include conducting immunisation extension patrols, school visits, and training for village birth attendants. It would also include getting medical supplies from the area stores to the rural health clinics and aid posts. In the area of education; it would include providing basic educational materials and education subsidies to schools. It would also include school supervision.

List of Abbreviations

Abbrev.	Meaning
ABG	Autonomous Bougainville Government
BAMS	Bridge Asset Management System
CoS	Cost of Services Study
CPI	Consumer Price Index
DHMC	District Health Management Committee
DHO	District Health Officer
DHQ	District Head Quarters
DoT	Department of Treasury
DPM	Department of Personnel Management
DSIP	District Service Improvement Program
ENB	East New Britain Province
ESP	East Sepik Province
FAD	Function Assignment Determination
GIS	Geographical Information System
GoPNG	Government of Papua New Guinea
GST	Goods and Services Tax
HC	Health Centre
HIV	Human Immunodeficiency Virus
HR	Human Resource
HRD	Human Resource Development
HSIP	Health Sector Improvement Program
HQ	Head Quarters
JICA	Japan International Cooperation Agency
K	Kina
KvA	Kilo Volt Amperes
KWh	Kilowatt-hour
LLG	Local level Government
MCH	Mother and Child Health

MOU	Memorandum of Understanding
MPA	Minimum Priority Activity
MBP	Milne Bay Province
NBC	National Broadcasting Commission
NDoE	National Department of Education
NDoH	National Department of Health
NDoW	National Department of Works
NEFC	National Economic and Fiscal Commission
NGO	Non-Government Organisation
NIP	New Ireland Province
O&M	Operations and Maintenance
OIC	Officer in Charge
PBM	Provincial Budget Model
PEB	Provincial Education Board
PEC	Provincial Executive Council
PER	Provincial Expenditure Review
PFMA	Public Finance Management Act
PGAS	PNG Government Accounting System
PHQ	Provincial Head Quarters
PIP	Public Investment Program
PLLSMA	Provincial and Local Level Service and Monitoring Authority
PNG	Papua New Guinea
PNGIPA	Papua New Guinea Institute of Public Administration
POM	Port Moresby (the National Capital)
RAMS	Road Asset Management System
RIGFA	Reform of Intergovernmental Financing Arrangements
SHP	Southern Highlands Province
SRC	Salaries and Remuneration Commission
TA	Travel Allowance
TSC	Teaching Service Commission
TV	Television

UPNG	University of Papua New Guinea
VBA/VHV	Village Birth Attendant/ Village Health Volunteer
VC	Village Court(s)
WHP	Western Highlands Province
WNB	West New Britain Province

1. Introduction

1.1 Acknowledgement

The Cost of Service Study has become a defining piece of work within the National Economic & Fiscal Commission. The Commission owes a debt of gratitude to the members of the original 2004-5 team that pioneered the original ambitious study and to the members of the second team who updated the work in 2009-11. This report is a summary of the work of these committed NEFC teams.

1.2 The 2005 Cost of Service Study

The 2005 Cost of Service Study was undertaken as part of a range of analytical work to inform the design of the new intergovernmental financing system. Such was its quality and utility that it not only ably served this principal purpose, but it has since been used in a variety of ways to promote clarity and understanding in the sub-national context [refer section 1.4].

1.3 Purpose and objectives of this report

This report is written for the motivated reader seeking to develop an understanding of the cost of services study – both its methodology and results. In writing and publishing this report the NEFC is motivated by three objectives; firstly to promote transparency within the intergovernmental financing system, secondly to provide information that may be of assistance to the wider audience, and thirdly to ensure the knowledge acquired through the cost of services studies is sustained and not lost due to the passage of time.

This report, in addition to the annual Fiscal Report, is one of the major ways in which NEFC seeks to promote transparency in how the system of intergovernmental finance operates in Papua New Guinea. The cost of provincial services study is a fundamental element in establishing the level of fiscal need that exists at the sub-national level, on a province by province basis. The level of fiscal need is used in calculating the annual grant allocations.

The findings of the costing study are useful for purposes other than informing the grant calculation process. So a second purpose in publishing this report is to share aspects of the study that the NEFC considers may be useful to a wider audience. In this respect this report complements the other ways in which the NEFC releases this information, such as through the Provincial Budget Model series, and makes the information available to inform and influence better decision making. The NEFC is particularly cognisant of the need to encourage better provincial budgets that more specifically support the delivery of the basic set of services that are relevant to all provinces.

A third motivation for this report is to promote the sustainability of knowledge and understanding within NEFC that has been gleaned through the initial study in 2005 and the update in 2011. And to help shape the thinking that needs to happen in anticipation of maintaining the study in the coming years. Many lessons have been learned and this report helps to synthesize those lessons in a coherent form for the benefit of those at NEFC who will be charged with maintaining the quality and relevance of the costing study.

1.4 Iterative Uses of the Cost of Service Study

As we have already discussed in section above the origins of the Cost of Services Study was to establish, in an intellectually robust manner, the relative *fiscal need* of each province and thereby to support the introduction of the new intergovernmental financial system (RIGFA). However NEFC soon discovered that the Cost of Services Study had uses well beyond its original scope. Other tangential uses for the costing information became apparent as the Cost of Services Study became an essential means of analysing and guiding sub-national budgeting and spending.

The iterative uses for the cost of services continue to emerge, they include:

1) In 2007 the NEFC completed and published the first Provincial **Expenditure Review** (PER)

   The PER is a review of provincial spending with a focus on operational spending particularly that which supports the delivery of basic services. The review uses the cost of services study extensively as a benchmark against which to compare provincial spending. Since the launch of the initial report, the PER has become an annual review completed and published by the NEFC. The findings of the review are disseminated extensively, both in the national capital of Port Moresby and across the country.

2) In 2008 the NEFC developed and launched the Provincial **Budget Model** (PBM)[1]

   The PBM was an initiative that started as a desire to share the costing information in an accessible way with provincial administrations. Each provincial administration was provided with a copy of the PBM populated with the costing information that pertains to their particular province. The model is a tool that can act as a guide for provinces in their budget setting. It has a vast array of data and can be used at various levels – both simple and more advanced – as the user requires. Importantly, the PBM suggests with great specificity what a good operational budget may look like for each province.

3) In 2010 the NEFC completed the first set of Provincial **Budget Assessments**

   The provincial budget assessments review aspects of the provincial budgets to ascertain the level of budget support and prioritisation that provincial governments give the delivery of basic services. Other facets of the budget such as its timeliness and presentation [for visibility and accessibility] are also included in the assessment. The assessments use the cost of services study extensively as a benchmark against which to compare provincial budget allocations. Since the initial assessment of the 2010 budgets the provincial budget assessment has become an annual review completed and published by the NEFC in the Annual NEFC Fiscal Report. The findings of the review are also discussed in the mid-year regional forums facilitated and held by NEFC each year.

4) Also in 2010 the NEFC in collaboration with the University of Papua New Guinea (UPNG) created the **Geobook series**

   The Geobooks programs are a series of interactive visual maps that store a range of information on each district and province. The information includes schools, health facilities, roads, airstrips and is relevant to a wide range of parties including government officials, professionals and academics. The data was collected via the cost of services study.

[1] The Provincial Budget Model (PBM) was originally called the Unit Costing Model (UCM).

5) In 2012-13 the World Bank conducted an analytical review of expenditure by provincial administrations on rural health from health function grants and provincial internal revenue[2]

The review was conducted in partnership with the NEFC and the Australian Department of Foreign Affairs and Trade. The review uses the cost of services study extensively as a benchmark against which to compare provincial spending. It seeks to better understand the impact of the increased funding for rural health since 2009 on frontline rural health services.

6) In 2013-14 the NEFC worked jointly with the National Department of Education to design an equitable system of distributing the national education subsidy to schools

This study has resulted in the creation of a *remoteness index* that can be used for a variety of purposes. The study and its methodology draw deeply on the cost of services study.[3]

7) The Cost of Services Study is an excellent mechanism for testing the veracity of the Function Assignment Determination

In conducting and updating the cost of services study the NEFC is forced to turn the FAD functional responsibilities in to a series of actionable activities. This process of interrogation unpacks the meaning of the FAD and tests it for sense and alignment with reality. In this sense the Cost of Services Study can be viewed as a critical complimentary exercise in validating the sense and completeness of the FAD.

1.5 The 2011 Update

In 2009 a decision was made to undertake an update of the original study. The primary motivation for the update was to contrast the annual costs that were generated using the 2005 study and an indexation methodology to a new updated cost study that used the most recent data available.[4] The approach adopted by the update team in updating the data largely sought to mirror the approach of the original study.

At the conclusion of the update in 2012, the NEFC compared the results of the updated study to the results generated by the indexation approach. Critically, this analytical process confirmed that NEFC's indexation methodology using a combination of CPI and population growth is an acceptable basis for growing the costs between updates. On average, the overall costs for provinces over the six year period 2005-11 grew at a slightly slower rate under the indexation approach than it would have when applying the resurveyed data.

The analysis considered whether CPI alone would be an adequate deflator or whether the continued use of population growth was important. The analysis demonstrated that CPI alone was inadequate to reflect the movement in costs and so retaining the element of population growth was desirable. The analysis then considered whether an indexation methodology using individual provincial population growth was preferable to national population growth. The modelling showed there were limited instances of difference between the approaches and so, on the basis of simplicity, the NEFC will adopt the use of the national population growth rate [for all provinces] for indexation in future.[5]

[2] The review is titled *Below the Glass Floor* and was published in July 2013 and has been widely disseminated.

[3] A report on the education subsidy and remoteness work is due for publication shortly.

[4] The NEFC used an indexation approach to maintain the currency of the 2005 study. Each year costs were indexed by CPI plus a provinces historical population growth.

[5] There was also some discussion around the veracity of the provincial population growth rate statistics.

During the update process some changes were made to the original model. These changes were to improve the veracity of the model, correct for minor errors, or adjust for changes in assumptions due to new information. The cumulative impact of the changes to each provinces estimated costs were minor.[6]

[6] The percentage impact on the total costs for each province due to these modelling changes were between one and six percent.

2. Strategy for Conducting Future Costing Updates

"So one of the key questions facing the NEFC is what strategy should it adopt in updating the Cost of Services Study in to the future?"

The Cost of Service Study has become a cornerstone of NEFC's work and informs many activities and studies being conducted at the sub-national level. Its value is proven. The challenge is to sustain the work, maintain its currency and improve its utility and quality in a manner that is both pragmatic yet technically sound.

So one of the key questions facing the NEFC is what strategy should it adopt to the ongoing process of updating the Cost of Services Study? The strategy will need to incorporate the lessons that have been learned through undertaking the initial study in 2004-5 and then conducting the update in 2009-11. In designing such an approach it may be helpful to establish a set of principles to guide the evolution of the study that reflect both its importance and the need for it to remain practical. At this juncture it's also timely to make summary of the specific areas where the study can and should be further developed to ensure it remains fit for its intended purpose[s]. The sections that follow develop on these themes.

2.1 Lessons from the 2011 Update Study

The approach adopted in 2011 was largely one of retracing many of the steps taken in the fieldwork stage of the original 2005 study, i.e. to visit each province and to update as many aspects of the data as possible. This approach was largely successful however some important lessons were learned. The study was updated with new prices and inputs and the reasonableness of the underlying assumptions [the activities and inputs] were tested. There were however a number of areas that could have been updated or strengthened that the strategy was unable to address.

What constraints did the 2011 update process experience?

- Conducting this comprehensive update study as a single project placed a considerable burden upon NEFC's limited resources.
- This in turn distracted NEFC staff from other work areas over the life of the project.
- The project length grew, and changes in key NEFC staff and advisers had an adverse impact upon the project's completion.
- Ultimately, as a consequence of the above, key facets of the project had to be deferred.

In designing an ongoing strategy the NEFC is mindful of the lessons learned from the experience it has already amassed and wants to address the constraints encountered in conducting the 2011 update. To do this an incremental strategy of updating the Cost of Service Study may be a suitable approach. Under this approach updating the study would be undertaken in an incremental and progressive manner as a combination of mini-projects and periodic updates.

Mini-projects may include a collaboration with another agency (and/or development partner) which would see a specific area of the costing study updated, such as the update in the roads data roads via an update of the Department of Works provincial RAMS database [Road Asset Management System]. Another example may be an update in the area of the costs of rural health facilities.

Periodic updates might include the countrywide provincial price survey to establish a new set of prices, known as the *basket of goods*, for each province. Another periodic update might be to integrate the latest National Department of Education student enrolment numbers in to the cost model.

Under this approach data would be collected and integrated in the model at different times according to a 'costing calendar' that NEFC would design. This would mean that not all data would relate to a particular point in time. This is not a weakness *per se.* Indeed, it is a reality in many models that derive their datasets from large informational databases that they must take an incremental approach to updating their datasets. To allow for this difference in the timing of the updates, the design will need to: (i) diligently track the various datasets, and (ii) include a system of indexation that ensures the data is adjusted to reflect current levels.

2.2 Principles that will guide an incremental approach

The following principles can guide an incremental approach for updating the cost of services study:

1) **Robustness:** Ensuring the quality of the study is maintained and enhanced

   This will involve targeting priority areas of the study where the assumptions and the completeness of the study can be improved upon. It will also involve moving the study [on the continuum] from being highly conservative to being somewhat more realistic. This latter point will help ensure that frontline services are, over time, more adequately funded to meet Government's aspirations of improved service delivery.

2) **Consistency:** Reviewing the alignment between the study and the Function Assignment Determination (FAD) to ensure there is consistency between the functional responsibility identified in the FAD and the cost study

   This will likely involve NEFC working in a close ongoing collaboration with the Provincial and Local Level Services Monitoring Authority (PLLSMA), the Department of Provincial and Local Government Affairs, provincial representatives and line agencies. In this way the updating of the cost study becomes a mechanism that naturally promotes the evolution and improvement of the FAD.

3) **Efficiency:** Looking at areas of the study that are high in complexity and consider the best and most sustainable manner for maintaining these areas in the future

   A balance needs to be struck between technical quality, utility and the resourcing required to maintain the study. There is a tension at play; whilst the credibility of the study should not be compromised the methodology must be sustainable.

4) **Collaboration:** This involves looking for win-win opportunities to update data by collaborating with other agencies [sectors] and development partners to jointly undertake mini-cost studies that meet the needs of both NEFC and partner agencies.

   NEFC has amassed a rare ability in conducting primary research in Papua New Guinea allied to its skills in specifying responsibility and complex costing exercises. There will be opportunities for NEFC to work collaboratively with other parties – sectors and development partners – in a synergistic manner in collecting information and conducting studies.

2.3 The Natural Evolution of the O&M Study

The 2005 and 2011 Cost of Sub-national Service (O&M) Studies have helped us to better understand the rural service delivery context. We now better understand the functions and activities that must happen at each provincial headquarters, district centre, health facility and school and the cost of supporting those functions and activities. However we also better understand the gaps in our knowledge and the work that remains to be done to consolidate and even expand on our understanding. The sections that follow expand on some of the areas of work that need to happen to improve on what is an already good product and to expand our understanding in areas that have yet to be explored.

2.3.1 Improving the Product

There are a number of areas within the Cost of Sub-national Service (O&M) Model that could, and should, be reviewed and improved upon. This will involve an investment of time from NEFC staff but will also likely involve the participation and in some cases partnership of other stakeholders.

Projects include:

1) **Refreshing the Activity Set**: The Cost of Sub-national Service (O&M) Study is founded on the premise that Government is seeking to deliver a standard set of basic service across the country. It follows, that determining just what those services are is the single most critical step in this whole process. NEFC worked with a range of stakeholders to identify a standard set of services in 2005 and that set of services was affirmed and modified during the 2011 update.[7] However, there is a more substantive task that awaits the NEFC and that is ensuring that the standard set of services accurately reflects the country's evolution and its increasing fiscal capacity. Where once a bare-bones approach to costing was a necessity now, perhaps, with the country's improved fiscal position a less austere outlook can be adopted.

   Next Steps:

   - The NEFC is well positioned to work with national line agencies to identify the reasonableness and sufficiency of; (i) the standard set of activities, and (ii) the cost assumptions that underpin the cost estimates for those activities. Without limiting the work that will be required, there are specific areas relating to the health and education sectors that merit careful review.[8]

   - Once the activity set has been refreshed NEFC can work with PLLSMA and DPLGA to update the Function Assignment Determination.

   - The new activity set can then be integrated in to the Cost of Sub-national Service (O&M) Study to ensure the cost estimates reflect the most up-to-date understanding of Government's service delivery aspirations. As a consequence, the right level of funding will then more closely match the current functional responsibilities of government at each level.

[7] A minimal approach was taken to modifying the standard set of services in 2011.

[8] In health additional value-adding work can be undertaken in the areas of functional clarification and estimating the cost of differing levels of rural facilities. The nexus between government and church health providers, and their individual functional responsibilities and costs, also merits careful examination. Further, the emergence of the PHA modality cannot be ignored and needs to be considered. PHA's are significantly changing the decentralised landscape and their responsibilities and costs need to be better understood so that funding can be appropriately aligned.

In education there is a need to examine, clarify and improve the functional understanding, activity sets and cost estimates that relate to supporting schools. This is particularly timely given the Government's commitment to fee free education and the increasing sums that are being directed to schools.

2) **Integrating New Provinces**: In 2012 the Government announced the formation of two new provinces – Hela and Jiwaka. As these provincial administrations develop and undertake the normal range of provincial administrative and service delivery activities it will be necessary to establish their costs with the normal level of acuity.

3) **A Sustainable Methodology for Travel Routes**: The travel routes component of the Cost of Sub-national Service Study (O&M) is complex due to the weight of detail. The origins of this complexity are the NEFC's determination to understand and establish an accurate cost for rural service delivery in each district across the country. 'Travel' was rightly seen as being fundamental to this end. Given the complexity, it is timely to consider what a sustainable methodology might be for updating this area in the future whilst still providing the cost relativities that are valued and beneficial.

4) **Updating the Register of Sub-national Transport Infrastructure Assets**: Transport assets are extravagantly expensive to build. And the cost of maintaining the Government's network of non-national rural transport assets [including roads, bridges, wharves, jetties and airstrips] is highly significant. The National Department of Works holds the country's register of road and bridge assets. It is critical that this register is maintained on a periodic basis so that the information can inform the quantum of funding that should be allocated to sub-national levels to maintain these assets.

   All non-national roads are presently recorded as a maintenance responsibility belonging to provincial administrations. This is unlikely to be correct. In reality the responsibility is likely to fall across the provincial, district and LLG levels of government and administration. However the process of classifying non-national roads is still to be completed (by NDoW) and until this is done it is impossible to identify with accuracy the specific responsibilities.

5) **Urban Services**: The 2005 and 2011 Cost of Sub-national Service (O&M) Study had a primary focus on service delivery to the rural majority of Papua New Guinea's population. Urban services are of a different nature and have been identified as the subject of a separate study and report. Some initial work and thinking was done on scoping urban services at the time of the original 2005 O&M study. This needs to be revisited and consideration given on scoping a substantive Cost of Urban Services (O&M) Study.

2.3.2 Expanding our Understanding

In undertaking work in the twin areas of *responsibility specification* and *costing* over many years the NEFC is very aware of the areas that remain to be explored and further developed.

These areas include:

1) **Equity of Infrastructure**: The Cost of Sub-national Service Study (O&M) seeks to establish a realistic estimate of the recurrent costs for funding a standard set of basic services based on existing service delivery facilities and infrastructural assets. The existing study does not seek to address the question of equity inasmuch as the concept relates to the evenness of coverage of service delivery facilities and infrastructure across the country. In an ideal world Papua New Guinea would have a suitably even spread of schools, health facilities, roads and wharves in each locale. We know the present situation is not even in this sense and this is why Government initiatives in the *development domain* [such as PSIP, DSIP and LLGSIP] are intended to address this inequity.[9] Addressing these gaps is a long-run ambition and will happen in part as a response to the local areas competing development priorities.

   Next Steps:

   - The NEFC is well positioned to work with national agencies to identify the evenness in coverage of government service delivery facilities and infrastructural assets. Identifying the critical asset gaps would be a meaningful contribution of information to assist decision-makers in the capital budget allocation process.

   - Once development spending [such as PSIP, DSIP and LLGSIP] results in new service delivery facilities or infrastructural assets it becomes critical for these assets to be supported with a recurring stream of O&M funding. NEFC is well positioned to estimate the recurring stream of O&M costs for various assets. This will help ensure that Government is aware and able to support new assets in to the future.

2) **Equity and Optimisation of Staffing Levels**: Neither does the existing study seek to address the question of equity inasmuch as the concept relates to the evenness and coverage of staff across the country. Staff in this sense includes public servants involved in administration and service delivery activities. In an ideal world each administrative hub and service delivery centre would have an appropriate level of staffing to deliver a similar level of public administration and services – we know this is not always the case. Staffing levels will be incrementally adjusted as new service delivery facilities are developed and staffed, however other adjustments may also be necessary to ensure that the right number of staff are situated in the right place.

   Next Steps:

   - The NEFC is well positioned to work with national agencies to identify the evenness in coverage of government staff in the areas of service delivery and administration. Identifying the critical staffing gaps would be a meaningful contribution of information to assist decision-makers in the human resource budget allocation process.

   - Once a methodology has been developed for determining a reasonable compliment of staff in a particular area this can inform the level of O&M funding to be allocated.

[9] The District Service Improvement Program, or DSIP, is the Government's key modality for funding development projects at the district level.

3. General Methodology

3.1 Parameters of the Costing Study

There are different approaches to undertake costing. Some countries adopt a *unit cost* approach whereby they establish an output cost for a specific service like the cost to immunize one child. Due to constraints with data for Papua New Guinea's situation, a different approach was required.[10] To determine the cost of an output it would require that actual outputs were being achieved in practice. Since the amounts being spent in most sectors currently fall well short of what is required, with the result that service outputs are not actually being achieved, it is very difficult to determine what the cost of an individual output would be. In addition, very little data is available to identify with acceptable accuracy the specific activity or even program on which expenditure has been focused. Equally, data collection on outputs (number of immunization achieved, for example) is patchy. Faced with this reality, the NEFC needed to design an alternate approach to the costing task.

In 2005 the objective was to establish what delivering a standard set of basic services might cost. Once that was established the funding could be aligned and committed to support that objective. Once the desired outputs were adequately funded they could then be delivered. So, in theory, at some stage in the future it should be possible to undertake output costing using some historical expenditure and output result information to determine the cost of an individual output in a specific location.

That said the manner in which NEFC has conducted the costing has derived many real benefits. The costs have been built from the ground up. This means NEFC has had to conceptualise the inputs necessary for each activity, and develop a model that calculates its cost. This has allowed NEFC to acquire a rare insight in to the work of the sub-national level and the specific costs that are involved. The cost profile that emerges is in essence a model recurrent budget for the province and, as such, it has allowed NEFC to use the costing as a benchmark for the many comparative exercises that have already been discussed.

3.1.1 The cost of existing service delivery programs

It is possible that some of the services Government is attempting to deliver may not be the best way to achieve the desired outcomes. Within the scope of a study like this, it was not feasible to question whether the government (or indeed, anyone else) should be providing these services. In any case, this is not a primary role of the NEFC.

Rather, we assumed that the first step should be to actually begin effectively delivering the services which are expected of all levels of government, according to current government policy. This then provides a basis for analysis of whether specific services are actually needed, whether there is justification for government intervention at all, or whether the same service can be better or more efficiently delivered in another way (for example, through a user-pays arrangement, or through private providers).

[10] In Papua New Guinea provinces have, over time, adopted their own budget practices and this has led to large differences in the provincial Charts of Account. As a consequence the expenditure data is recorded in a varied manner across provinces. This inconsistency as well as the lack of 'activity specific' data recording makes the data unsuitable for deriving unit costs from existing spending data.

At this stage we have assumed that the costing should relate to existing service delivery programs as agencies and lower-levels of government understand they should be delivered. For this reason, this costing study should be seen as a first step in a gradual process of linking funding to function. In the future, it should be possible to build on this by looking in greater detail at some of the broader questions identified above.

3.1.2 A similar set of services in all provinces

The approach used for this study was also influenced by the main reason we undertook the costing: to determine how much each individual provincial government needs, so that the sharing of resources can be more fairly based.

Where there is not enough funding to meet all provinces' service delivery costs, it is especially important that provinces' different costs should be assessed on a common set of services. This ensures that inadequate funding will be shared in a fair and equitable way. To achieve this, it was necessary to develop a costing based on a similar, standard set of services.

In practice, some provinces undertake some services and not others; in some the level of service is greater than in others. In the 2005 study for example, the Southern Highlands provincial government was pursuing a policy of free education—the aim was to provide sufficient funding to schools so they would not have to charge school fees from parents. This was not the case in the other 18 provinces at that time, where parents contributed to the cost of educating their children. These decisions are made by provincial governments on the basis of their individual priorities and their ability to fund these decisions.[11]

In order to develop a costing which is comparable across all provinces, we had to assume a standard set of services and inputs for all provinces. There are nevertheless some variations. For example, fisheries extension services are assumed to be provided only to those people who identify themselves as fishers in the 2000 census. The number of persons to whom these services are provided is therefore much greater in coastal provinces than in the Highlands.

The standard set of services approach is open to the criticism that it undermines the main benefit of decentralisation—that the specific services needed in a particular location should be determined by the constituents in that area. This is precisely the argument for not having centralized determination of budgets in a country as diverse as Papua New Guinea.

However, it can also be argued that most of the core services covered in the study are of such a basic nature that there is little room for them to be varied [i.e. reduced]. Many of these core services also have potential externalities. That is, if they are not delivered in one province, this has spillover effects for other provinces, or for the whole country. For example, if one province chooses to give health services a low priority, which results in the spread of disease, this can lead to increases in disease in neighbouring provinces. Reducing health and education services has an impact on the overall human capital of the nation. This in turn affects the economy, because Papua New Guinea needs healthy, educated people to develop.

[11] The example of school fees and free education is highly interesting and relevant. We see above that in recent year's individual provinces such as the Southern Highlands adopted policies of free education. However in 2011 the national government significantly increased the funding it provided directly to schools. The specific intention was that education at the lower levels would be free for parents and not contingent on parent's ability to pay school fees for their children. This also reaffirms the need for the cost of service study to be updated on a regular basis to ensure it is capturing the changing realities of government service delivery.

3.1.3 The cost of what should be spent, not what is being spent

As noted above, the study focuses on what provincial and local governments should be spending, not what they have actually spent.

A costing of service delivery is often based on what is actually being spent. In Papua New Guinea's circumstances, it was not meaningful to adopt this approach. In most cases, the levels of spending on basic services by provinces had fallen well below what was required to sustain basic services. This low spending was largely due to the inadequate funding base available to provinces. The cost estimates produced by the original 2005 study show that more than half the provinces have less than 50% of what they need to meet their basic service delivery responsibilities.

In around 15 provinces, revenues were simply too small to meet these costs. However, even in those provinces which did have enough revenues to afford their costs it is clear that funding is often not spent on the right things.[12]

In 2009, with the implementation of RIGFA, provinces with lower levels of funding began to receive more money to support the delivery of basic services.

3.1.4 Service delivery programs as they should be delivered not as they necessarily are being delivered

In 2005 some sectors service delivery had all but collapsed, in part because there was no funding to pay the recurrent costs of service delivery. For example, in many parts of Papua New Guinea it had been many years since agricultural extension patrols were conducted on a regular basis. Many of the provincial public servants we interviewed at that time could remember a time when service delivery operated as it should, but most indicated things were not happening that way today. We drew on their knowledge of what services were delivered to develop a program of standard services as they should be being delivered, rather than what is actually being delivered at the moment. In the 2011 update we reconfirmed that the standard service delivery programs established in 2005, with minor adjustments, remained a reasonable set for this exercise.

Again, this does not preclude further work which may identify that some of these activities are no longer useful or do not produce the desired outcomes. However our view is that an essential starting point must be to restore the current program of activities before determining if any of them no longer need to be delivered.

One of the motivations in publishing this work is to disseminate widely the information, including the activity set, which effectively establishes a minimum set of service delivery activities. By publishing the set of activities NEFC hopes to stimulate a debate on the veracity of the activity set and to glean insight on where change may be necessary to ensure we continue to reflect through the *cost of services study* a reasonable standard set of services in Papua New Guinea today.

3.1.5 Only existing facilities

A broad-based approach to costing based on outputs (e.g., the number of immunized children) would need to consider whether the existing level of infrastructure and facilities are adequate to achieve that output.

[12] The 'right things' in this context means funding the operational cost of basic services first.

In undertaking this study, we assumed that the costing should relate to actual, existing and operational facilities and roads, and to current levels of staffing. Again, this represents a first stage of work on estimating what provincial governments need. Since many facilities are currently not operating as they should (mainly because of insufficient recurrent funding), a first step is to get them operating again and delivering services as they should. Only then can some evaluation be undertaken of whether there are too many, too few or the wrong kind of facilities to achieve realistic and affordable goals of service delivery. This is discussed further on page 20 .

There is an additional reason why this approach was preferred. Anecdotally it appears that many provinces are budgeting inadequately for service delivery at least partly because they have no idea what needs to be spent. The approach we have adopted makes the costing information more relevant to provincial administrations as they are operating today. Arguably it is important to get existing facilities operating properly before building any more.

In essence we have adopted a zero-based budgeting approach. The information produced from the study can, and is, being used by provincial staff to determine what funding they need to allocate in order to achieve effective service delivery.[13] Of course, much more than this is required for service delivery to improve—there are other elements of service delivery (including timely release of funds, trained staff, effective policies and programs, good supervision and management, monitoring and evaluation) that also need to be in place.

3.1.6 Only existing staff

The number of staff in a particular province has an important influence on the cost of administration overheads, because these are based on allowing a certain level of administrative resources (stationery, utilities, vehicles, computer equipment etc.) for each staff member. Administration costs for each province are based directly on the actual staff numbers recorded in the provincial establishment register. In some provinces, there are no provincial staff designated as working in specific sectors. For example in the 2005 study, Milne Bay was the only province showing staff working in the environment sector, so it is the only province for which administration costs are included in this sector's costing. It is assumed that in other provinces, staff of other sectors (probably lands) perform these functions. In this case, an allowance is still made for the administrative overheads for that staff member, but these will be costed under the sector in which they work.

There is some evidence that public servants are inequitably distributed between provinces—in other words, some provinces have fewer staff than they should have, while other provinces have more staff than they should. However, in order to determine the appropriate number of staff, it is necessary to consider more than just the population of the province. Factors that influence appropriate staffing levels include:

- more staff are needed where patrols are undertaken mainly on foot, because it takes longer to deliver services to the same number of people;
- smaller provinces need more staff because there is a basic component for any provincial administration—one administrator, two deputy administrators, one health adviser, one education adviser, one planner and so on—regardless of the size of the province.

[13] As discussed on page 12 the costing study has become a key benchmark for guiding budget and expenditure practice at the sub-national levels.

It was not possible to incorporate an analysis of appropriate staffing levels into the present study because of time and resource limitations. Accordingly, existing staffing levels formed the basis of the costing estimates. However, it would be appropriate to develop the costing database further by determining an appropriate formula for allocating staff, and using that to adjust the costing numbers based on those staffing levels. This is discussed further on page 20.

3.1.7 Only recurrent non-salary costs

The costing study only covered the annual non-salary, recurrent costs of service delivery. It does not include the cost of staff salaries, or the cost of capital expenditure.[14]

Staffing costs were excluded from the study for two reasons. The first reason is the scale of the task of determining an optimal level of staffing for each sector and province is so large a task that it was beyond the resources available for this study. A range of factors affect staffing levels. Regardless of its size, there is a certain minimum staffing level required in each district and province. Beyond this, staffing should be broadly related to the population of the province. However, some provinces and districts will need more than the average number of staff because they have more facilities, or because it takes longer to travel around the district—so more staff are needed to cover the same number of people.

The second main reason why staff costs were not included is that this is one area of government expenditure where current costs and current revenue are always matched. The national government fully funds the cost of public service and teacher salaries. Each provincial government receives a grant to cover teachers' and public servants' salaries. The grant is budgeted by the province, but administered in Waigani by central agencies. Provinces do not bear any additional costs if the grant is insufficient, and any over-run is met by the national government.

There are however several exceptions to the 'recurrent non-salary costs only rule'. The following costs have been included in the 2005 and 2011 studies. The reasons for their inclusion are discussed in more detail in the remainder of this section.

Capital Costs[15]	Personnel Costs
Replacement of vehicles	Teachers Leave Fares
Replacement of 'banana' boats	Local-level government councillors' allowances
Office furniture	Provincial assembly members' salaries
Office equipment	

Since the objective of this study was to estimate provincial cost responsibilities, it was not relevant to cost salaries. There are two exceptions. The first is leave fares. Teachers' leave fares are a provincial cost responsibility, and the grants are managed locally. Any under-funding is met by the province.
In the 2005 study it was found that in all but two provinces, teachers leave fare grants were not sufficient to cover the estimated costs. In the 2005 study, the additional cost which the province is required to meet over and above the grant provided by national government was included.

[14] The only exception to this is the inclusion of the costs of vehicle and boat purchases which is discussed later in this section.

[15] It is assumed that vehicles would be replaced every 7 years, and boats and outboard motors would be replaced every 5 years. Office furniture [desks and chairs] is assumed to be replaced every 10 years and office equipment [computers, printers and photocopiers] every 5 years.

Effectively the study includes a depreciation allocation on these vital assets to allow for their replacement.

In the 2011 study, a different approach was taken in order to capture a fuller cost of service delivery within the model. In the 2011 study, the full estimated cost of teachers leave fares is included in the model and the national government grant for teacher leave fares is then deducted on an annual basis in later calculations.[16] Whilst the approach has changed, the result will be similar. Similarly no allowance was made for the cost of public servants leave fares in the study. The NEFC's observation while conducting the study is that the majority of public servants working in provincial administrations come from the provinces in which they are based. This means they are not entitled to leave fares. On this basis it was assumed that the amount of the current public service leave fare grants would be sufficient to cover that cost.

The second exception is the costs of local-level government councillors' allowances and provincial assembly members' salaries. These are not covered by any national government grant, and provinces and local-level governments have to meet these costs out of their internal revenue or their other grants. These costs are considerable, as is noted below, and so they have been included in the costing under the sector described as 'assembly'.

The study does not attempt to estimate capital costs. Capital costs are for periodic purchases which do not have to be budgeted for every year. They include the costs of major rehabilitation of roads or other infrastructure, or building new facilities to improve the access of citizens to services. These are not the same as development expenditure. 'Development' is a broad concept which refers to expenditures which supports economic growth. It can include some recurrent funding—for example to support improving school enrolments or reducing infant mortality. In Papua New Guinea, this distinction is not always well understood, and 'development expenditure' is often used to refer to projects, which often involve capital expenditure.

The only exception to this is the inclusion of the costs of vehicle and boat purchases. Vehicles and boats are the most essential capital input for service delivery in Papua New Guinea and they require regular replacement because the state of roads in Papua New Guinea means that they deteriorate quickly. A standard replacement cycle for vehicles in a developed country would be 3-5 years. For Papua New Guinea's conditions, given the cost of new vehicles, it was assumed that vehicles would be replaced every 7 years, and boats and outboard motors would be replaced every 5 years.
These costs are incorporated into annual cost estimates (for example, by including one seventh of the cost of a replacement vehicle).

"Vehicles and boats are the most essential capital input for service delivery in Papua New Guinea and they require regular replacement because the state of roads in Papua New Guinea means that they deteriorate quickly."

Much of the service delivery infrastructure in Papua New Guinea, including the road network, is badly deteriorated. The main reason for this has been a chronic shortage of recurrent funding for maintenance over many years. The result is that only capital expenditure—on major rehabilitation, reconstruction or refurbishment, will address such serious degradation.
For example at the time of the 2005 study, more than 60% of the provincial road network was in need of major upgrading or rehabilitation before it will be in a condition where routine annual maintenance is sufficient to keep the roads open.

[16] The national government grant for teacher leave fares is then deducted on an annual basis in later calculations as and when required – i.e. for the NEFC annual grant calculation purposes.

With the increased funding for routine maintenance via the Transport Infrastructure Maintenance Function Grant and the large annual DSIP grants there are now significant revenue streams available for redressing the state of degradation of transport assets and then to routinely maintain them. Achieving this however is likely to require a high level of coordinated effort given the size of the technical challenge.

Costing this kind of capital expenditure is very difficult, time consuming and costly, because each separate item of infrastructure has to be individually assessed. The Department of Works was attempting to quantify the need for capital expenditure on roads through the Road Asset Management System (RAMS) database for a number of years. However given the national focus on 'national roads' the currency of RAMS as it relates to non-national road assets is unknown. What is clear is that the cost of rehabilitating road infrastructure is so high that it must be spread over many years to be affordable. The same is probably true of the other capital work needed—on administration buildings, airstrips, power and water supplies for districts. Indeed the plight of the provincial road network has probably degraded even further since the 2005 study. In more recent times the government has focused its policy, and rehabilitation funding, on a limited number of priority national roads. So, provincial governments that are responsible for maintaining provincial roads are left to seek out other funding sources to meet this enormous and growing cost.

In undertaking this study, we took the view that it was more important to quantify recurrent costs, because these need to be funded every year. The main reason why infrastructure and administration buildings are in such a poor state is that these recurrent costs of regular, routine, annual maintenance have been consistently under-funded for many years. Unless this problem of under-funding recurrent costs can be addressed, the cycle of building or rehabilitating infrastructure, only to have it deteriorate over time through lack of maintenance, will continue. Funding capital expenditures is only a short-term solution to the problem of degraded infrastructure. The only long-term, sustainable solution is to get recurrent funding right and supporting the socialisation of a maintenance culture.

In a subsequent phase of this study, it would be appropriate to try to use the costing information here as a basis for more work on optimal staffing levels, and identifying where capital expenditure on upgrading or building new facilities should be concentrated. These matters are discussed further on pages 20 and 20.

3.1.8 Only Provincial and LLG cost responsibilities

In most sectors, at least two levels of government have joint responsibility to pay for most different services. Road maintenance is a good example. Papua New Guinea has approximately 19,000 km of roads. The national government accepts responsibility for maintaining national roads (around 8,000 km); provincial and/or local-level governments are responsible to pay for maintenance of the remainder (around 11,000).[17]

In other sectors, the national government pays for some activities while provincial and local-level governments pay for others. In the health sector the national government pays for the operation of hospitals and church-run rural health facilities, while the provincial and local-level governments pay for government-run rural health facilities and the supervision of rural health services.

The cost of services study has focused only on those costs which are currently accepted as being the responsibilities of provincial or local-level governments. This means the cost estimates do not cover the whole cost of service delivery in all sectors.

[17] The information is from the Department of Works Road Asset Management System (RAMS) database that was used in the 2005 cost of services study. This database has not been updated since that time.

Importantly, cost responsibilities evolve over time, so the responsibilities as established in 2005 are not necessarily exactly the same as the responsibilities today. Government policies and approaches on structures, services, responsibilities and funding streams can change the relationship between *function and funding* and it becomes necessary to adjust the costing to match these changes.

3.1.9 Only affordable inputs for basic essential services

> *"…in a resource-constrained environment an initial costing, such as this one, should aim to reflect a realistic and affordable costing of service delivery rather one that is overly ambitious. It is easier and less distortional to scale up costs as they relate to service assumptions rather than to reduce them."*

Notwithstanding the resource windfalls of recent years, Papua New Guinea has experienced several periods over the last 25 years where government resources are very strained. It is essential therefore to ensure relevance and utility that a costing of service delivery should be affordable given the fiscal constraints regularly facing the government.

In determining the activities and in particular the inputs to those activities, the costing study adopted an approach of including only the minimum and essential costs without which it would not be possible to deliver the service.

Examples of this minimum essential costs approach include:

- Assuming that local government councillors are paid only the minimum allowance set by the Salaries and Remuneration Commission (whereas in fact many of them are being paid twice that rate);
- Where workshop participants are entitled to a traveling allowance, it was assumed that there are no costs of lunch or evening meals associated with the workshop;
- There is no allowance for stationery supplies in rural health facilities—it is assumed the main stationery used is patient record books, and these are supplied by the national government;
- It is assumed that there is no additional cost involved in inspecting proposed sites for establishment of new schools, because these visits can be combined with other inspection or supervisory visits to nearby schools.

In some cases, these cost estimates are open to the criticism that they are too conservative—that the real cost of service delivery is actually higher than is estimated here. This may be true either in theory or practice. However, the rationale for adopting this conservative approach is that in a resource-constrained environment an initial costing, such as this one, should aim to reflect a realistic and affordable costing of service delivery rather one that is overly ambitious. It is easier and less distortional to scale up costs as they relate to service assumptions rather than to reduce them. This sense of conservatism and iteratively scaling up also reflects the reality that funding for basic services has been lacking or absent for many years. Therefore, government will increase the funding levels incrementally in keeping with the provincial administrations ability to absorb this funding and apply it to supporting basic services. The need for a less austere costing approach is discussed on page 18.

3.1.10 Identify costs by province and by district

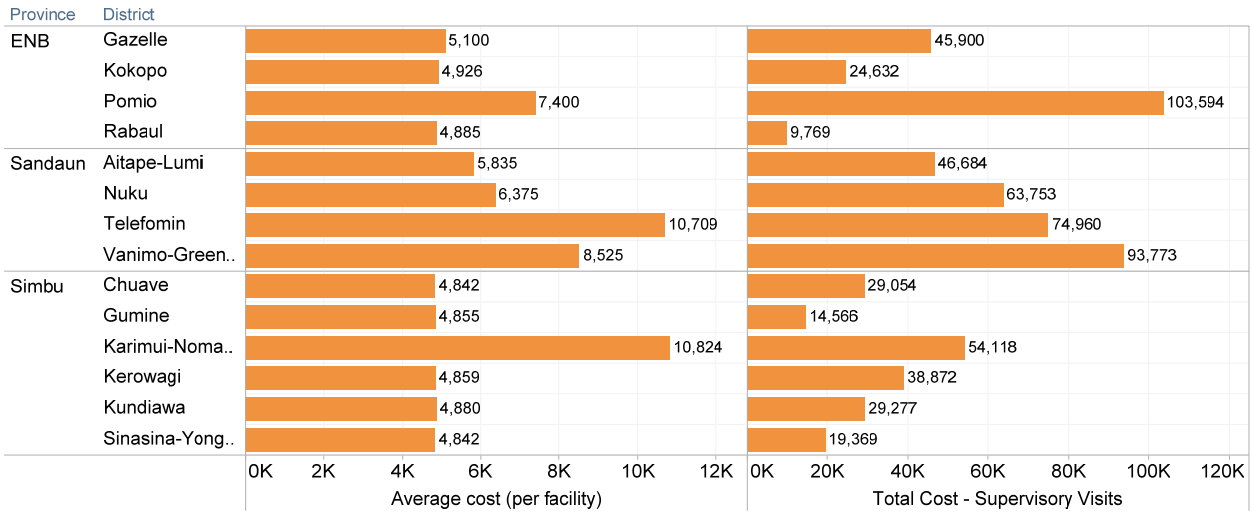
"…it has become apparent that in many provinces district service delivery is very poorly funded… What is useful is to understand both who is responsible and where does that activity actually happen… For this reason, the study attempted to accurately identify costs at a district level as well as at a provincial level, in the hope that this would assist provincial administrations to more fairly allocate resources in the future."

A key objective of the study was to identify differences between provinces and districts. Again, this relates to the main purpose of the study – to find a basis for linking funding more accurately to actual location-specific costs. Whilst a great deal of attention has been focused on distinguishing district-level service responsibilities from provincial or national ones, this distinction of *responsibilities* taken in isolation is not very useful. What is useful is to understand both who is responsible and where does that activity actually happen. NEFC's analysis has confirmed that most services are ultimately delivered in districts where 85% of the population lives. So what matters most is to understand where does the funding for these service delivery activities need to reach, in order for it to be spent to support the activity?

Funding for the routine, recurrent costs of delivering district services comes mainly from the funding provided to provinces. District administrations are part of the provincial administration and are funded through the provincial budget. However, it has become apparent that in many provinces district service delivery is very poorly funded. In particular, there is little accurate identification of how costs vary between the districts within a single province. It is common for each district administration to be allocated the same amount in the budget. For this reason, the study attempted to accurately identify costs at a district level as well as at a provincial level, in the hope that this would assist provincial administrations to more fairly allocate resources in the future.

The graph below depicts the estimated cost for district staff to conduct supervision visits to health centres within their area. The variation in cost clearly illustrates the inequity and inappropriateness in funding all districts the same amount for this service.

Graph 1: The cost of supervisory visits to health centres in East New Britain, Simbu and Sandaun



The first column of costs illustrates the average annual cost of supervision per facility. If we use Sandaun Province as an example we can see that in Aitapi-Lumi district it costs half the amount (K5,835 per facility) for conducting visits than it does in Telefomin district (K10,709 per facility). We can also see that whilst Telefomin district has the highest average cost per facility it does not have the highest total cost. This information can be seen in the second column of costs where we see Vanimo-Green district needs K93,773 each year to fund all district-to-health centre supervision in the area whilst the total annual cost to Telefomin district is less at K74,960. Interestingly out of the three provinces in this sample the most expensive district for conducting this supervision activity is Pomio in East New Britain where the total estimated annual cost is K103,594.

What this example demonstrates is the difficulty and dangers in deriving 'average costs' in sub-national Papua New Guinea. The exceptions from the 'average' are high in number and the variation in costs are large.

Addressing the short-fall in recurrent funding for district services is one of the most critical issues in improving service delivery.

3.1.11 Accurately identify travel costs

Travel costs are a major component of the recurrent costs of service delivery in Papua New Guinea. Service delivery in the health, education, agriculture and village courts sectors (and to a lesser extent in others) involves travel of different kinds:

- Health workers and agricultural extension officers travel out to health facilities, schools and communities to deliver services;
- Program supervisors and school inspectors travel from the district and provincial level out to districts and to health facilities, schools and village courts to ensure that services are being delivered as they should;
- Goods and supplies (such as school books and medicines) have to be transported from the province to the district and from the district out to health facilities and schools;
- Workers in remote facilities (outside the district centre) travel in to the district or province for training;
- Provincial assembly members and local-level government councillors travel to the LLG centre or provincial capital for assembly and council meetings.

Much of this travel is not happening as it should for a variety of reasons, including lack of access to vehicles or boats and lack of funding for fuel, travel allowance and other costs. In almost all districts, some of this travel must happen on foot. In other districts with few or no roads, most travel is on foot, by boat or by air. As commercial air services to remote areas have decreased, the costs of air travel to these remote areas has increased.

There are significant differences between travel costs in different parts of Papua New Guinea, depending largely on whether there is road access or not. One aim of the study was to accurately record the travel routes, distances and methods for each district, so that these costs can be more accurately calculated. The method by which this was done is described in Section 0.

3.1.12 Province-specific pricing of inputs

In order to more accurately reflect the differences in costs between different provinces, the study uses data on the actual cost of specific inputs that have been surveyed in each province. The provincial price survey (also known as the 'basket of goods survey') is described in more detail in the accompanying methodology report. The main aim of provincial price survey is to establish the local prices for around sixty goods and services including stationery, office equipment and consumables and repairs, fuel, vehicles and boats and maintenance, food and clothing (for prisoner detention) and accommodation and venue hire for training or workshops. The most recent survey was conducted in 2009. Spot prices for fuel were collected for each province at both the provincial capital and the district levels in 2011.

3.1.13 Only rural, not town, services are included

The primary focus of this phase of the costing study was on service delivery to the rural majority of Papua New Guinea's population. Urban services are of a different nature and need to be the subject of a separate study and report.

3.1.14 Autonomous Region of Bougainville

The Autonomous Region of Bougainville (ABG) represents a special case. In 2005, a new government for Bougainville was established which has a very different structure and functions to the other provincial governments in Papua New Guinea. The structure and funding arrangements for Bougainville are covered by the Organic Law on Peace Building in Bougainville – Autonomous Bougainville Government and Bougainville Referendum. The provisions of the Organic Law on Provincial Governments and Local-level Governments do not apply to Bougainville.

Notwithstanding the uniqueness of Bougainville, the region was included in the 2005 and 2011 studies in the belief that costing service delivery in Bougainville is an urgent necessity in order to work out the funding under the new constitutional arrangements. For the purposes of this study it has been assumed that Bougainville has the same functions as other provinces. This may not be the case in practice, as the Bougainville Organic law envisages that Bougainville will negotiate the transfer of a number of additional functions. One in particular which is to be transferred from the outset is the Police function. The data on Bougainville costing should be read with this in mind.
For comparative purposes, it was also assumed that district administration in Bougainville was arranged in the same way as in other provinces, with one district administration for each open electorate. In fact Bougainville has 12 districts. We gathered data on administration using these 12 district centres and then undertook a "reconciliation" which adjusted the data to a three district arrangement.

The 2005 ABG costing information has been used albeit in a limited way. In 2010 the costing information was used as a benchmark to compare Bougainville's spending on basic services.[18]

There is scope to revisit the ABG costing information and to develop an up-to-date set of activity cost estimates that reflect Bougainville's administrative and service delivery responsibilities.

[18] *Review of Budget 2010, Autonomous Bougainville Government*, September 2010.

3.2 How NEFC approached the original task (2004-2006)

The original costing study was an ambitious exercise that spanned several years in planning and implementation. The exercise was a sum of many parts, and the data assembled helped NEFC to form a deeper understanding of the Papua New Guinea service delivery context and one soundly based on evidential analysis. The sections that follow discuss large segments of the study.

3.2.1 Defining provincial, district and local-level responsibilities

The first step in developing the costing was to determine what services provincial, district and local-level administrations are responsible for delivering. While there is broad agreement over the sectors that sub-national governments are responsible for, there is often dispute about who pays for particular activities within those sectors.

The costing study began with a comprehensive survey of the current activities in three provincial administrations – Eastern Highlands, East New Britain and Manus. From these surveys, lists of provincial activities were developed. In some areas NEFC then consulted with national agencies to determine whether the activities some provinces engage in were actually considered necessary.

For example, in one province surveyed, NEFC was told that the education staff travelled to Port Moresby at the beginning of each year to oversee the resumption of teachers in the province on to the payroll. After consultation with the National Department of Education, it was determined that this is an optional activity, and not considered necessary. Most provinces discharge their responsibilities in this area by sending the resumption forms to Port Moresby by post or courier. This activity was not included in the costing of the education sector.

3.2.2 Determining what standards to apply

Most national agencies have some level of minimum service standards which they expect provincial administrations to meet. In some cases, these are based on targets for service delivery coverage (output standards). In other cases they are focused on a particular level of activity, or inputs.

As discussed below, the study has developed cost estimates based on inputs, rather than outputs. We have therefore preferred to use input-based standards to define the activity level for the costing. These were based on surveys of standards which provinces are attempting to implement, combined with discussions with the line agencies in each service delivery sector.

3.2.3 Identifying the inputs needed to deliver the required services

Once a reasonable level of detail had been worked out as to what services need to be delivered, what activities those involve, and what level of activity is required, the study specified the inputs required to carry out the activities that have been determined to comprise service delivery.

For example, all public servants require certain goods and services to be able to work effectively. We describe these as ‘administration overheads’. They include inputs such as stationery, power supply, telephone, reasonable access to a vehicle, fuel for basic travel, the repair of computers and other office equipment, and regular maintenance of office buildings.
The main inputs needed to carry out service delivery fall into the following broad categories:

- Fuel, other supplies and routine equipment servicing, which are derived from the provincial price survey;

- Travel costs and training costs, which are based on province and district-specific travel routes and local costs of accommodation and venue hire;
- Board fees and politicians' salaries and allowances, which are based on determinations under the Boards Fees and Allowances Act and the Salaries and Remuneration Commission Determination of National Parliament, respectively;
- Road maintenance costs and maintenance costs of buildings, which are based on the Department of Works data, cross-referenced with other data.

3.2.4 Field visits

Over a six month period, the study team visited every province in Papua New Guinea and spoke to staff from provincial and district administrations. In almost every province, at least one district was visited in person. For the other districts, interviews were conducted with district administrators or other district administration staff who were brought to the provincial capital for individual interviews. During interviews with provincial staff including program managers in the key sectors, information was collected on provincial staffing, facility levels and other aspects of provincial administration operation.

District staff were asked to provide detailed information on service delivery in each district using a large-scale map of the district. The district maps were marked with roads (including many not already identified on the maps), schools, health facilities, police stations, rural lock-ups, airstrips, wharves, power supplies, and village courts. Maps had already been marked with extension points which public servants would need to travel to in order to provide outreach services. Staff identified the routes they would use to reach all the facilities and outreach extension points. These routes were documented in detail, identifying the different methods of travel that would be used on each section of the travel route. The University of Papua New Guinea Remote Sensing Unit later digitized this information into a layer of its GIS mapping of Papua New Guinea. This enabled the study to include a very accurate measurement of the distances of each section of each travel route.

The 2011 update retraced many of the steps taken in 2005 and visited every province spending up to a week conducting a series of interviews with provincial and district staff. The objective of these visits was to ensure the validity of the underlying data and where possible to update the dataset with current information.

3.2.5 District services survey

During the period when this study was being developed there was considerable focus by Government on the rejuvenation of services in districts. District service delivery faces considerable impediments, not just inadequate funding. Poor infrastructure and the lack of access to power, telephones and other simple enabling services make it very difficult to deliver government services effectively.

The costing study involved interviews with public servants from every district administration in Papua New Guinea. This provided a unique opportunity to collect comparable information on each district. It was therefore decided to use the opportunity of interviews with district public servants to collect some basic information about the state of each district's infrastructure and services.

The information that was collected for each district included:

- Power supply and telephone access;
- Cost of fuel;
- Access to basic supplies (trade stores);

- Air and road access;
- Financial and banking services (including whether the district treasury is able to print a cheque and whether there is a cash office);
- Police presence;
- Number and condition of staff housing.

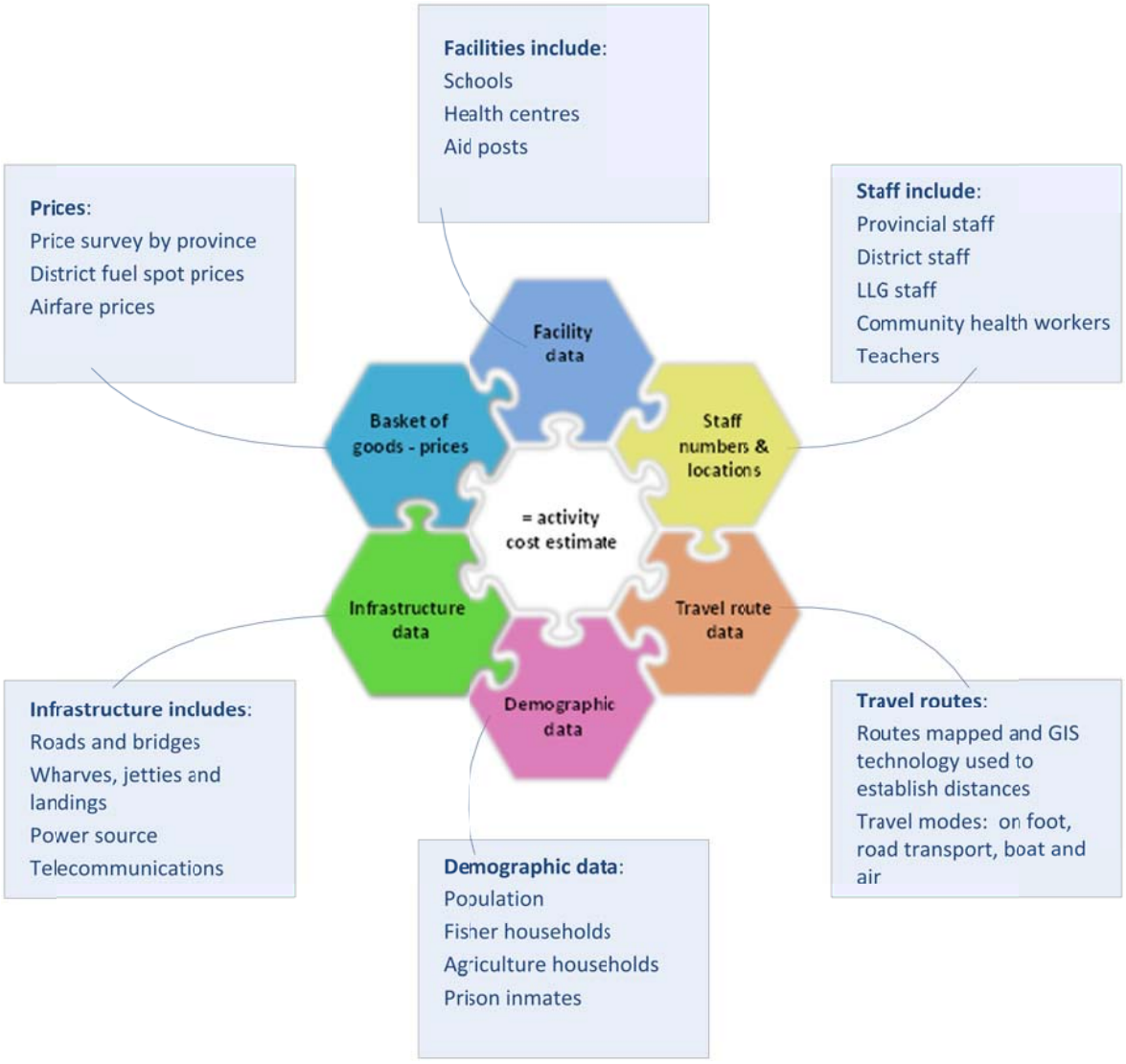
The 2011 update field visits included interviews with district public servants to collect similar information on the current state of enabling services at the district headquarters.

4. Conceptual Schematics

The study is large and expansive and some readers may find it helpful to gain perspective on the study's architecture through a series of illustrative schematics.

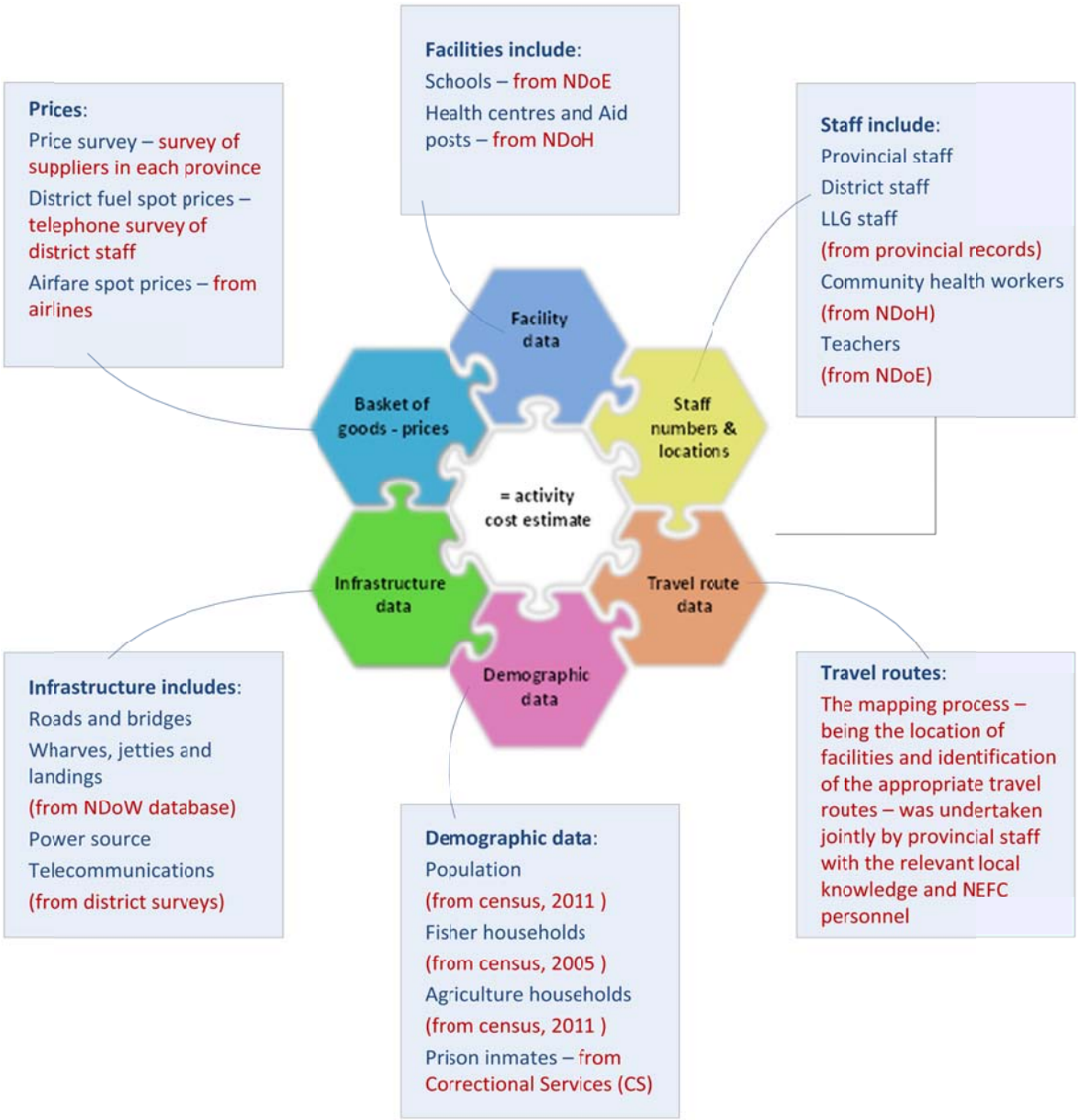
The first schematic divides the study in to its major informational pieces – so the study is viewed through the various datasets that have been collated to enable costs to be estimated. Every cost estimate in the study is calculated by using a combination of the six datasets together with a series of standard assumptions on usage.

Schematic 1: The Costing Data Jigsaw



The second schematic below notes (in red) the sources for the information contained within each of the six datasets.

Schematic 2: Major Data Sources (in red)[19]



[19] **Notes on data sources**

Prices: The provincial price survey involved surveying three relevant suppliers in each provincial capital in 2009/10. All other prices were updated in 2012, this included; the major price list, the generic price list, and the district fuel spot prices.

Facilities: Education facility data is from NDoE 2009 records. Health facility data is from NDoH 2011 records. Village Courts facility data is from the VC Secretariat 2012 records.

Staff: Teachers data is as per the NDoE 2009 Education Census. Rural health worker data is as per NDoH, 2011 data. For other provincial staff the provincial establishment registers were used as the source, these were mostly 2011/12 records.

Farmer: Information from 2011 Census (preliminary data).

Fisher: Information from 2000 Census. This information was not available in the 2011 Census (preliminary data).

Prison inmates: Information by province was provided by the Correctional Service in 2012.

Infrastructure: Roads, bridges and water infrastructure are per the NDoW 2005 RAM's database. District level power supply and telecommunications data was resurveyed in 2009/10.

5. Generic Cost Assumptions

This section of the report discusses the major assumptions that underpin the study and presents and discusses the costs of sectors and administrative division.

For readers with an interest in the detailed cost estimates at activity level these are provided in the appendices to this report in 'Appendix 3: Cost Estimates' on page 112**Error! Bookmark not defined.**.

5.1 Costing Administration Overheads

Every province [and district] and every division and sector within a province incurs a range of basic costs simply to support the existence of the staff they employ. These costs are often referred to as administrative overheads. Typically they include the cost of; communications, utilities, stationery, office cleaning, office equipment, office furniture, building maintenance and fittings. The approach adopted in this study was to calculate a reasonable cost for each of these services and then to convert the total of these costs in to a unit cost that could be applied to each staff member located at a particular level in a particular administrative division or service sector.

The table that follows provides a summary of the overhead costs included in the study, the key assumptions used, and the basis for the calculation. It should be noted however, that these are the main assumptions and there are often secondary assumptions that underpin the calculations. However it is not practical to exhaustively describe every detail of the way in which individual costs are calculated in this publication.

Table 1: Assumptions for Administration Overheads

Overhead Description	Input Unit	Key cost assumptions & basis of calculation
Communication Costs	Annual phone cost per person, plus cost of telephone allowance	Is based on the number of program/professional staff in the province/district and a survey of reasonable communication costs from a sample of provincial and national users. The 2005 data has been indexed. Does not apply to LLG's.
	Annual post/freight cost per person	
Stationary	Annual office supplies cost per staff person	Is based on: (i) the number of program/professional staff in the province/district, (ii) a survey of reasonable consumption levels, and (iii) provincial-specific prices. The 2005 data has been indexed.
Maintenance of Office Equipment	Annual computer amortization per computer	No service/maintenance assumption for computers. Assumes asset replaced every 5 years.
	Annual printer amortization per printer	No service/maintenance assumption for printers. Assumes asset replaced every 5 years.
	Annual printer consumables per printer	Assumes 1 toner per month per printer.
	Annual photocopier amortization per photocopier	Assumes asset replaced every 5 years.
	Annual photocopier consumables per photocopier	Assumes; 2 x 6 month 20,000 copy plans per photocopier; consumables of 1 toner/cartridge every 6 months. Does not apply to LLGs.
Utilities [power & water]	Annual electricity cost per staff person, plus cost of utilities allowance	The price of electricity and water was based on what an average person may use. This can be justified on the basis that the price of water and electricity does not vary across the country. The 2005 data has been indexed. Does not apply to LLG's.
	Annual water cost per staff person	
Vehicle Running Costs	Annual fuel costs for boat/car local travel within provincial capital	Assume annual fuel costs for local travel within provincial and district capital of 50 litres of zoom per boat, and 55 litres of diesel per vehicle. Does not apply to LLGs.

	Annual service/repair cost per boat/car	Assume vehicle assigned to administrator, plus one vehicle for each 6 staff and a boat for every 12 staff where required. Service cost per boat/car, plus new tyres/front brakes for car every year. Does not apply to LLGs.
	Annual boat/car amortization	Assumes car replaced every 7 years, boat replaced every 5 years.
Building/Furniture Maintenance	Annual repair of provincial HQ share and fittings maintenance	Unit cost per person includes – maintenance allocation p.a., 3 x normal light bulbs and 1 fluorescent light bulb p.a., and office desk and chair amortised over 10 years.
	Cleaning	Unit cost per person includes – 3 x boxes of Steelo pads, 12 x rolls of paper towels, 3 x 4 litre bucket, 3 x mop head, 3 x broom head and 12 x 200 ml bleach, plus labour cost of K10 per public servant per week.

5.2 Costing the Replacement of Essential Operating Assets

Whilst this study is focused on the recurrent non-salary costs of the provincial and district levels the replacement of essential operating assets is, for the purposes of this exercise, treated as a recurrent cost. The reason for including these costs which would typically be viewed as capital in nature is threefold. Firstly, these assets are of fundamental importance and enable public administration and service delivery at the sub-national level. Secondly, the operating environment at the sub-national level across the country is extremely harsh on the basic assets that public servants rely upon to conduct their regular activities. Office assets such as computers and printers and transport assets such as vehicles and boats depreciate quickly [despite maintenance] and need to be replaced. And finally, meeting the replacement cost of these operating assets is [most often] the responsibility of the sub-national levels of government. For these reasons the cost of replacing these basic operating assets has been factored in to the study.

The table that follows provides a summary of the assumptions underpinning the cost to replace essential operational assets that are included in the study, the key assumptions used, and the basis for the calculation. It should be noted however, that these are the main assumptions and there are often secondary assumptions that underpin the calculations. However it is not practical to exhaustively describe every detail of the way in which individual costs are calculated in this publication.

Table 2: Assumptions for Essential Operating Assets

Overhead Description	Input Unit	Key cost assumptions & basis of calculation
Office Equipment Replacement	Annual computer amortization per computer	No service/maintenance assumption for computers. Assumes asset replaced every 5 years.
	Annual printer amortization per printer	No service/maintenance assumption for printers. Assumes asset replaced every 5 years.
	Annual photocopier amortization per photocopier	Assumes asset replaced every 5 years.
Office Equipment Replacement	Office desks and chairs	Assumes asset replaced every 10 years. Allocation included in the Building/Furniture Maintenance unit cost.
Vehicle Replacement	Annual allowance for the cost to replace 4WD vehicles	It is assumed that; (i) a 4WD vehicle is required for every 6 professional/technical staff located at the provincial level and every 12 professional/technical staff located at the district level, (ii) the effective life of a vehicle is 7 years, and (iii) the cost of the vehicle is the province-specific price.
Boat Replacement	Annual allowance for the cost to replace boats	It is assumed that; (i) *where significant boat travel is required* a 40 horsepower banana boat is required for every 10 professional/technical staff located at either the provincial or district levels, (ii) the effective life of a boat is 5 years, and (iii) the cost of the boat is the province-specific price.

5.3 Costing Staff Training & Workshops

The study assumes that all public servants receive some training on a periodic basis. More specifically the study assumes each year 3% of public servants receive externally provided training. Half of these public servants are assumed to attend a two week management training course provided by the Papua New Guinea Institute of Public Administration (PNGIPA) in Port Moresby, while the other half attend a 2 week training course provided in the provincial capital with a trainer provided by the PNGIPA.[20]

The study also assumes, each sector provides a 5 day in-service training per year for 50% of its staff and this is provided at the provincial headquarters (unless otherwise indicated and justified in the sector specific assumptions set out below).

And finally any training of community members is determined by the requirements of each sector (see below) and that in these cases only the cost of the trainers, refreshments and course materials are included. No participant costs are included.

Table 3: Assumptions for Training & Workshops

Overhead Description	Input Unit	Key cost assumptions & basis of calculation
Training for public servants	National Training course	Assumes 1.5% of public servants attend a 2 week PNGIPA management training course in Port Moresby. Costs include: return airfares [+ in-province travel costs if apt], course fees, accommodation, and travel allowances.
	Provincial Training course	Assumes 1.5% of public servants attend a 2 week training course in the provincial capital by a PNGIPA trainer. Costs include: costs of a trainer and course materials, travel costs to the provincial centre, accommodation and travel allowances for district staff.
In-service training for provincial sector program management staff	Provincial Training course	Assume 50% of program management staff receive 5 days of training per year at the provincial capital. Costs include: trainers travel costs, participants travel costs from the facility to the district or provincial centre plus accommodation and travel allowances, venue hire, course materials, simple refreshments [not meals]. Generally assumed to be 20 participants unless a lesser number is appropriate.
Community members	*Refer to the relevant sector for information*	
Standard provisions for workshops	Workshop – see relevant sector/division for detail	Costs include: travel from workstation to either district or provincial location for workshop, course materials, light refreshments, and where apt venue hire.

[20] This is based on the standard set by DPM for national public servants to receive out of country training (there is no corresponding provincial standard).

5.4 Costing Travel Routes[21]

Within the study the cost of travel has been viewed as falling within one of two areas. The first area can be viewed as the general cost of *around town* travel. This *around town* travel cost is provided for under the administrative overheads costing which is described under section 0 on page 49. The second type of travel is travel undertaken for specific administrative and service delivery activities. An example of an administrative activity would be the cost of annual budget workshops at the district level, and an example of a service delivery activity would be the cost of a health outreach extension patrol.

The travel routes exercise modelled a complex labyrinth of routes that administration, sector and frontline service delivery staff need to regularly travel to carry out their duties. There are three types of *within province* travel: (i) travel by service delivery personnel to administrative centres (district/LLGs) and service delivery points (facilities or extension points); (ii) public servants traveling from lower levels administrative centres (LLGs or districts) to larger administrative centres (provincial or district) for training etc.; and (iii) community members traveling from households to administrative centres (provincial/district or LLG) for training. The table below groups the various routes that were mapped [involving the use of GIS technology] and outlines the divisions/sectors that use the routes and the 'driver' of the coverage that applies.

Table 4: Categories of Travel Routes

Type of travel	Sectors	Coverage
District		
Province – District – Province	Office of the Administrator, Internal Audit, Policy Planning and Research, Education, Commerce, Agriculture, Natural Resource Management, Health, Community Development, Infrastructure	Number of Districts (actual location)
LLG		
Province – LLG – Province	Assembly, Office of the Administrator , LLG Administration	Number of LLGs (actual location)
District – LLG – District	Policy/Planning, Audit, District Administrator	Number of LLGs (actual location)
Facility/Community		
Provincial – Village	Communication, Environment, Land Administration, HIV	Village extension points selected to be within 2 hours walk of the population.
Provincial – Health Centre	Health	Number of Health Centres (actual locations)
District – Village	Police, Community Development, Agriculture	Village extension points selected to be within 2 hours walk of the population
LLG – Village	Village Courts	Number of Village Courts (actual locations)

[21] The area of travel routes is perhaps the single most complex area of this study. The study team believed that travel in rural Papua New Guinea is one of the most critical ingredients in providing an effective administration and service delivery system. It wanted to ensure that the costing in this critical area appropriately reflected the local realities facing administration and frontline service delivery staff at the sub-national levels.

District – School	Education	Number of schools (actual locations)
District – Health Centre	Health	Number of Health Centre (actual locations)
Health Centre – Village/Aid post	Health	Village extension points selected to be within 2 hours walk of the population.
Health Centre – School	Health	Number of and location of schools

The cost of travel to service delivery points is derived from the costs of fuel, travel allowance and accommodation. The table below sets out the basis of use for these costs.

Table 5: Assumptions for Travel-related Costs

Cost	Basis of Use
Fuel	The cost of fuel is calculated from return distance from provincial/district capital to designated service delivery point multiplied by the cost per kilometre for zoom or diesel (depending on the mode of transport is boat or car). If travel is by plane, then the cost of fuel is taken to be the price of the return ticket.
Travel allowance	The cost of travel allowances is calculated from number of travel days plus the number of days in each location multiplied by the DPM approved travel allowance for rural areas multiplied by the number of people making the visit.
Accommodation	The cost of accommodation is calculated from number of nights away multiplied by the cost of accommodation allowances (as provided by DPM) multiplied by the number of people making the visit.

Table 6: Other notes on Travel Routes Costs & Sources

Other assumptions and data sources are as follows.

Data	Source
Routes	The routes are province specific and based on the normal pattern of travel around the province. Information on travel routes and modes of transport was plotted on maps during interviews with provincial/ district public servants.
Mapping	These maps were then passed to the Remote Sensing Unit at the University of Papua New Guinea who used satellite maps to plot the exact distance travelled on each travel route.
Fuel consumption & price	Average consumption levels were established for travel by vehicle and boat. Fuel spot prices were surveyed by district.
Airfare prices	Spot prices of commercial airfares were surveyed for all applicable air routes.
Foot	When travel is by foot, travel time rather than distance is required to be calculated as foot travel has no additional financial cost, but there are costs involved in providing travel and accommodation allowances to public servants. Foot travel time was based on one of two levels, either in flat terrain or in mountainous terrain.[22]

[22] The sources of the assumptions around 'foot travel time' are a combination of empirical studies in Papua New Guinea, test walks in Papua New Guinea (in Central Province) and expert opinion.

Public transport	Travel by frontline [facility] staff from their facility to the district or provincial headquarters is based on a proxy. The proxy is the relevant cost of the proxy public transport fare selected for that district (NEFC selected and established the price of an average LLG-District fare and an average LLG-Province fare in each district).

Regular *out-of-province* costs refer to the cost of travelling from the provincial capital to Port Moresby on duty travel. These costs are outlined below.

Table 7: Assumptions on out-of-Province Travel Route Costs

Data	Source
Air fare	Priced as Air Nuigini commercial airfares
Travel allowance	DPM approved rate for urban area
Accommodation	Cost of mid-level accommodation in Port Moresby

5.5 Costing Statutory Boards

Most provinces operate statutory Boards in several sectors. While not all provinces currently have all of these boards, the following Boards have been assumed to be in existence for the purpose of this costing exercise:

- Tourism Board
- Cultural Committee
- Provincial Youth Council
- Education Board
- Teacher Appointment Sub-Committee
- Health Board
- District Health Management Committee
- Provincial HIV Committee
- Provincial Land Board
- Physical Planning Board

The study assumed that Boards, unless specified otherwise, have the following structure and its members are paid travel and sitting fees based on a standard payment schedule:

- Twelve members, half of which are public servants and half community members
- The community members on the Board receive sitting fee for each day the board sits (the Chairmen of the board receives K200 per day [K100 in 2005], the Deputy Chair K100 per day [K80 in 2005] and ordinary Board members receive K100 per day [K50 in 2005]).

  Note: Public servants on the boards do not receive a sitting fee.
- Half of the Board members come from outside the provincial capital and hence are paid travel costs, travel allowances and accommodation costs. It is assumed that these all come from the "median LLG" in their province and travel is cost on that basis.
- It is assumed that refreshments are provided during board meetings, but not other meals.

This structure is based on the Provincial Health Board model and is more or less consistent with other sectors board guidelines (where they exist). The meeting frequency and duration of each board is described under the assumptions section of each sector.

6. An Overview of the 2011 Results

These results err greatly on the side of conservatism. In reality, much more funding will be necessary to adequately fund the delivery of basic services.

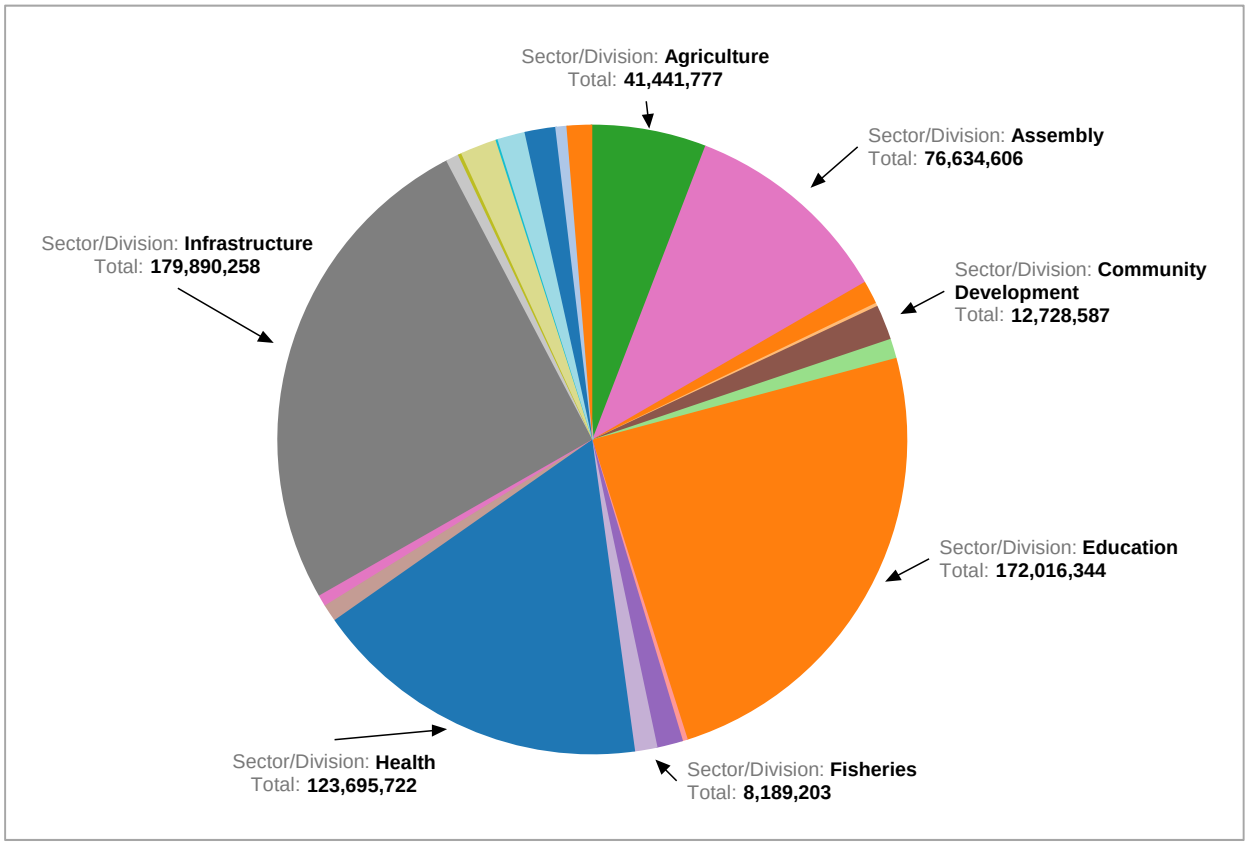
The 2011 update of the cost of sub-national services study continues to be is a highly conservative zero-based costing study that estimates the operational costs of provincial and local-level governments to fund the delivery of a basic set of government services at the sub-national level. It is based on existing infrastructure and designed to support existing staff. It is a bare bones study, intentionally designed to marry with the government's existing revenue streams that are limited. The real costs will be greater.

The high level findings of the 2011 study are as follows:

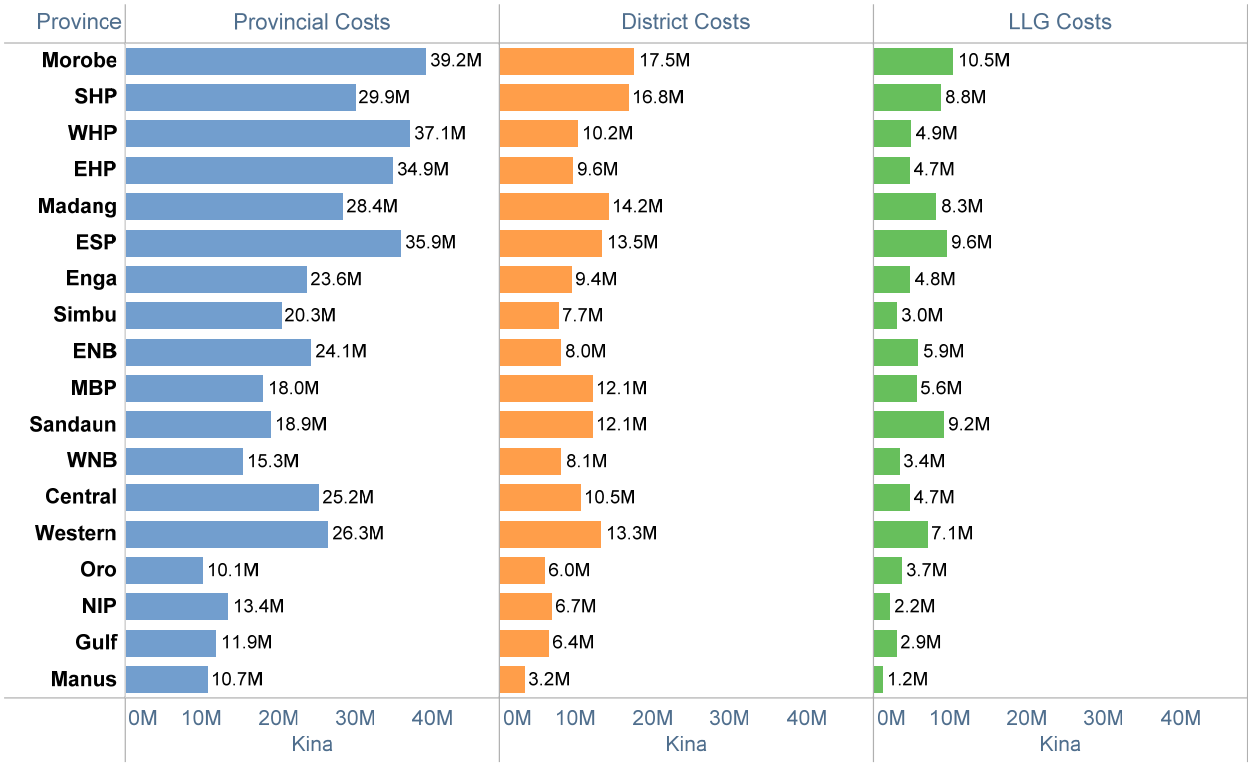
- Total costs, K709m
- Provincial costs, K423m
- District costs, K185m
- LLG costs, K100m

The graph that follows illustrates the costs by sector. We can see that the estimated O&M costs in three sectors – education, health and infrastructure – comprise two-thirds of the total estimated cost. The cost estimates in two other areas are significant – being assembly and agriculture – they comprise a further 16 percent.

Graph 2: Total Costs by sector



Graph 3: Costs by province and level



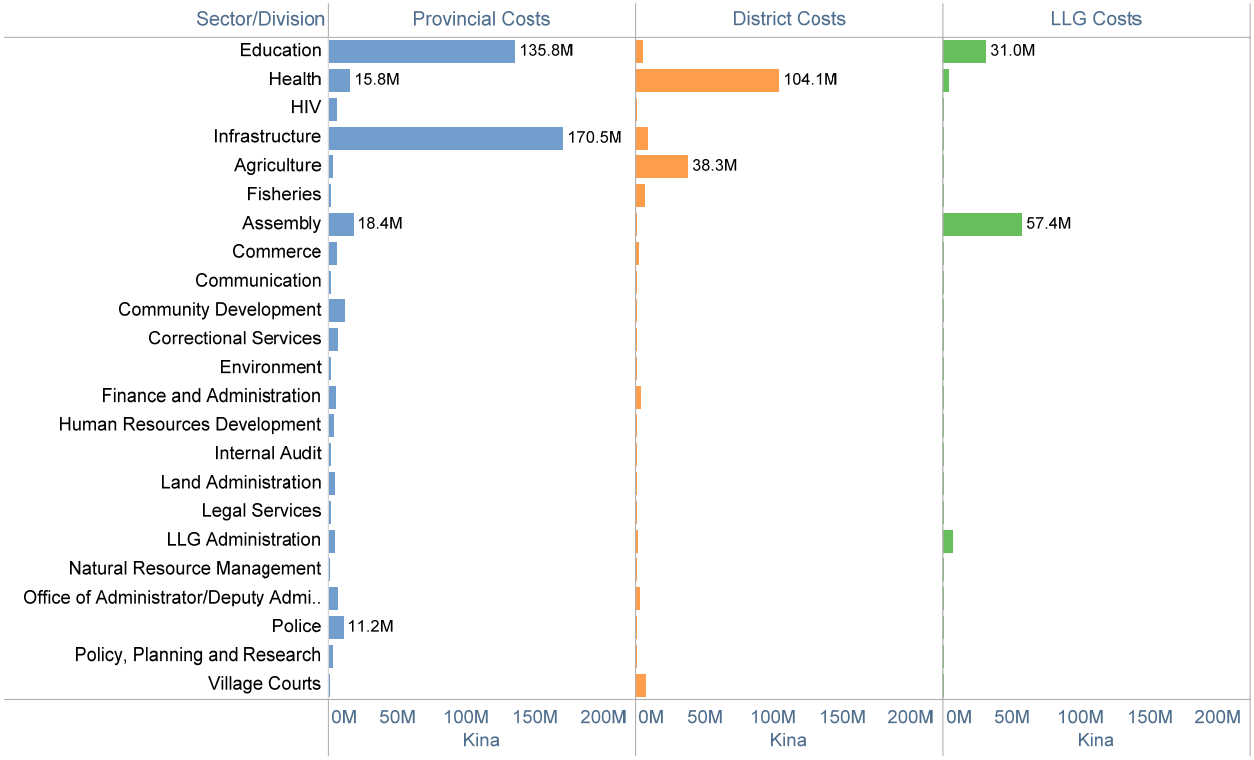
Provincial Costs, District Costs and LLG Costs for each Province. Color shows details about Provincial Costs, District Costs and LLG Costs.

The graph above illustrates the costs by province and allocates them according to functional responsibility (between province and LLG). And in the case of provincial costs it seeks to allocate the costs according to the administrative responsibility (between province and district). The ultimate objective is to reflect the cost where it would normally be incurred.

When reading the graph consider:

- The provinces are ordered by population. So Morobe with the highest population is recorded first and Manus with the smallest population is ordered last. A reader will quickly note that costs do not strictly align with population.
- Provincial level costs are dominated by the costs of infrastructure maintenance and support for education.
- District level costs are primarily support for health and agriculture.
- LLG level costs relate mostly to assembly and elementary/primary school class maintenance.

Graph 4: Sector/division costs for all provinces by level



Provincial Costs, District Costs and LLG Costs for each Sector/Division. Color shows details about Provincial Costs, District Costs and LLG Costs. The data is filtered on Province, which keeps multiple members.

The graph above illustrates provincial, district and LLG level costs for all provinces on a sector and divisional basis.

When reading the graph you will note:

- That most of the costs are found in only five areas; being the major sectors of health, education, infrastructure and agriculture and LLG assembly costs. These five areas comprise about 84% of the total cost estimate.
- Education and infrastructure activities are 72% of provincial level costs.
- Health and agriculture activities are almost 77% of district level costs.
- Education (school maintenance) and LLG assembly costs are 88% of LLG level costs.

7. Sector & Division: Discussion, Results and Assumptions

This section of the report discusses the major assumptions that underpin the study and presents and discusses the costs of service delivery sectors and administrative division.

For readers with an interest in the detailed cost estimates at activity level these are provided in the appendices to this report in 'Appendix 3: Cost Estimates' on page 112**Error! Bookmark not defined.**.

7.1 Major Sectors

Not all sectors have the same cost footprint at the sub-national level. Some sectors are large in financial terms and cost a lot to fund, whilst others are relatively small. The study found that four service sectors and one administrative area have very high costs relative to the whole. These are the sectors of; education, health, infrastructure and primary production, and the administrative area of LLG assembly services. These five areas collectively comprise 85% of the cost of services study. Because of their relative weighting and complexity this report provides more analysis on these five areas.

The challenge in drafting this report is to decide what information is useful to readers, and so include, and what is simply too much and therefore unintentionally overwhelming. The study is by nature comprehensive and detailed and whilst some readers may have an interest in the minutiae the reality is that even those readers will be interested in answering particular questions at a particular time and not the whole. The report in this section seeks to target the need for the many readers who want to get a general understanding of the sector results and the major underlying assumptions.

The sub-sections on the major sectors are ordered as follows:

- Summary information, including total cost and cost drivers
- A discussion of the sector
- A graph illustrating sector costs by province and level
- A table of the activity set immediately below the graph

Other information can be found at:

- An explanation of the principal cost methods adopted in this study can be found in chapter 5 ‘Generic Cost Assumptions’ on page 37.
- A list of costing terms and explanations can be found on page 108.
- Detailed costing’s by province, level and activity can be seen in the appendices to this report in ‘Appendix 3: Cost Estimates’ starting on page 112**Error! Bookmark not defined.**.

7.1.1 Education

Summary

- 2011 sector cost estimate, K172 million [2005, K119 million]
- Rural health services are provided at all levels of the sub-national system with a large amount administered at the front line – at facilities.
- The biggest proportion of the costs (79%) is at the provincial level.
- Cost drivers: The main cost driver in the education sector is the large **number of facilities** (i.e. schools) in rural areas that need to be operated, supervised and maintained.

  The cost of **travel** is another key cost driver. Travel is required for a range of education activities - for supervision, support and to distribute exam papers, education subsidies and school books. The more schools there are, and the further they are apart, the more travelling is involved in delivering education services.

Methodological note: Each classroom attracts a level of maintenance. However it is not possible to count the number of classrooms [and other ancillary school buildings] in every school across the country. So the study uses the **number of students** to derive an estimated cost. A per student **unit cost** for maintenance from an earlier study in education in Papua New Guinea has been used for this purpose.

Discussion

The total cost of provincial and local service delivery responsibilities in the education sector across Papua New Guinea is K172 million. This covers only those costs which provincial and local-level governments are expected to meet. The national government also supports a number of education service delivery activities, including initial supply of curriculum materials to new schools, school funding (via education subsidies), inspection and national department policy activities.

Education is one of the more difficult sectors to cost, partly because it is expensive and complex, and party because there is less clarity about who should pay for what than there is in other sectors.

The most expensive activity (K26 million per year) is the provision of school supplies. Together with school maintenance, this cost accounts for much of the cost of school operations. The cost of school operations is funded by a combination of:

- education subsidy provided by the national government
- education subsidy provided by provincial governments
- school supplies provided by (some) provincial governments
- school fees and other payments made by parents

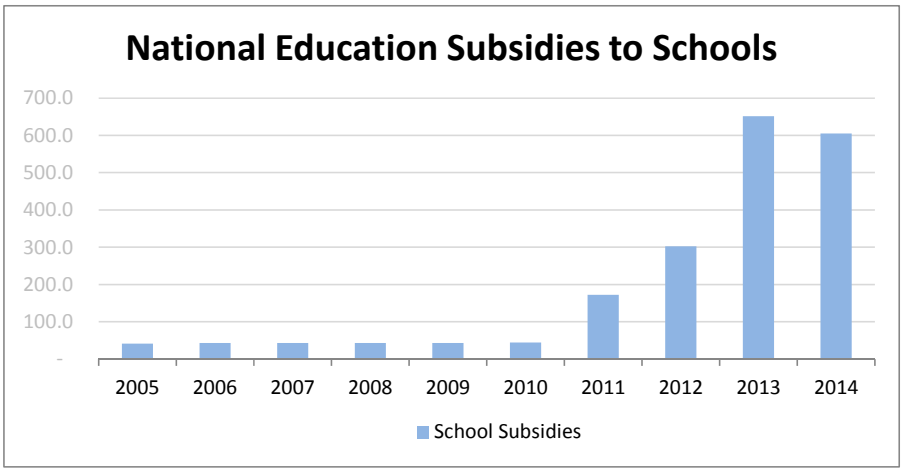
It is not possible to estimate the per-student cost of operating a school, without a detailed study of school operating costs. Such a study was beyond the scope of the costing study and its limited resources. It is therefore not possible to accurately estimate the total level of subsidy needed. The National Department of Education did commission a study of school non-teaching costs in 2007 and limited aspects of this study have been used in the 2011 O&M study update.[23]

[23] Where appropriate NEFC integrated aspects of the 2007 school non-teaching costs study in to the 2011 O&M study update.

Emerging Issues

Delivering an education service through a highly decentralised system such as Papua New Guinea's is complex and dynamic. The Government's policies and implementation strategies evolve and change over time and the system needs to adapt to complement these changes. Some changes can also directly impact the NEFCs cost estimates as functional responsibilities realign, expand or contract. Recent changes that are likely to impact the cost study include:

- Government policy on free education has resulted in a high increase in funding streams going from the national level direct to schools. In 2006 the government, via NDoE, appropriated about K34 million directly to schools as subsidies whilst in 2012 that amount increased to about K302 million (of which about K228.9 million was transferred to schools – see box text below). An almost sevenfold increase in just six years. In 2013 and 2014 the budget appropriate grew to K652 million and K605 million respectively.



- One question in light of these enormous increases is whether provincial governments are still expected to make a contribution to school operating costs, and if so, how much?[24]
- This policy change together with the existing uncertainty on who is responsible for school operating costs requires a better clarification of functional responsibilities in this area. Once these responsibilities are clarified costs can be re-estimated.

Exert from an article in The National newspaper on 3rd July 2012

Education subsidies among impact projects

This is the third year of the national governments fee free policy for education subsidies for Basic to Grade 10 and 75% for Grades 11 and 12. Education subsidies are among 17 impact projects being implemented in 2011 and 2012 in order to achieve the Department of Education's vision and mission statement. This was highlighted at a recent New Guinea Islands development workshop organised by the Consultative Implementation Monitoring Committee in Kimbe. The department said of the K300 million, K228.9 million had been paid out to schools nationwide. About K28.05 million was allocated to elementary, K93.5 million to primary, K94 million to secondary, K4.5 million to vocational training centres and K2.98 million to national high schools.

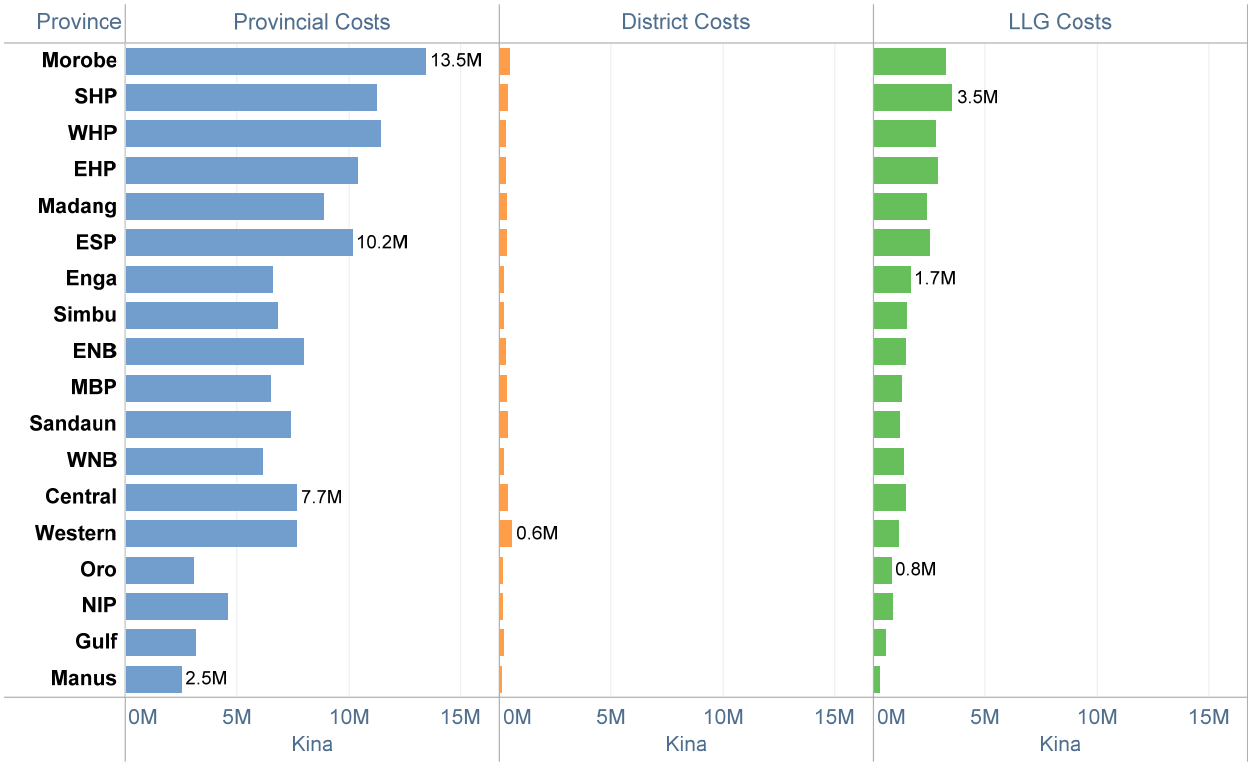
[24] In a diagram on page 13 of a recent NDoE publication entitled *Meeting the Challenge: Education in Papua New Guinea* there is reference to a provincial component of subsidies flowing from provinces to schools. NEFC analysis of provincial expenditure suggests that in recent years only 3 provinces pay a subsidy direct to schools.

Table 8: Education sector activities by level

Provincial level activities	**District** level activities	**LLG** level activities
K135.8 million	K5.2 million	K31 million
Administration Human Resource Development Elementary School Supplies Primary School Supplies Secondary School Supplies Provincial Education Board Provincial Contribution to School Operating Costs Teacher Leave Fares School Establishment Approval Teacher Appointment Exam Administration Pre-Service Training (Elementary only) In-Service Training (Primary & Secondary only) Secondary School Maintenance	District Administration costs Inspection and Advisory Visits Payroll Administration Provincial ratings conference	Elementary & Primary School Maintenance

The table above lists the activities that are included in the cost study. The graph below illustrates that the majority of education sector service delivery activities that generate costs are at the provincial level.

Graph 5: Education sector costs by province and level



Provincial Costs, District Costs and LLG Costs for each Province. Color shows details about Provincial Costs, District Costs and LLG Costs. The view is filtered on Sector/Division, which keeps Education.

We can see from the following graph that there are many significant activity costs in the education sector. Observations include:

- The larger activity costs are at the provincial level, higher costs include;[25]
  - school supplies to all levels totalling K28.7 million[26]
  - provincial contribution to teacher leave fares is estimated at K25.7 million
  - provincial contribution to school operating costs is estimated at K28.2 million
  - maintenance of secondary schools is estimated at K15.9 million
  - other high costs include exam administration and training
- K31 million, being 50% of the costs for maintaining primary schools are an LLG responsibility.[27]

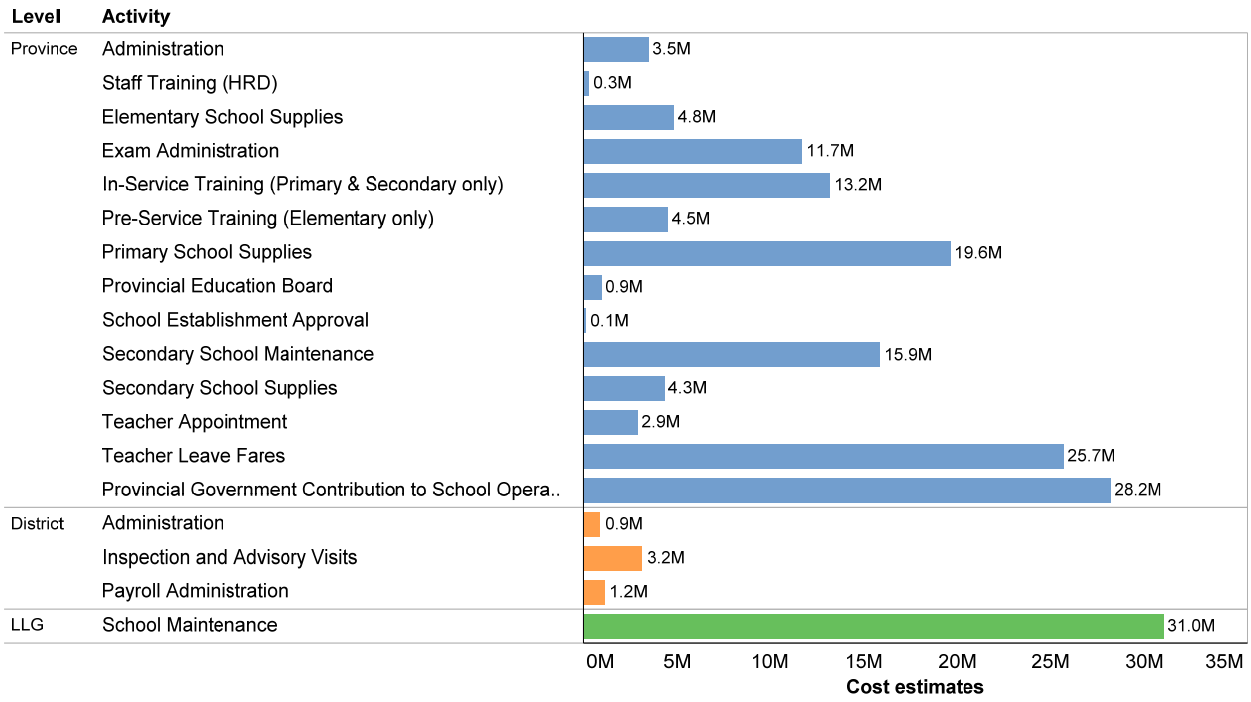
[25] School operating costs have been noted on page 28 as an emerging issue to be considered and clarified. Several of the costs included in the current cost study may be impacted; school supplies, school maintenance and the provincial contribution to school operations.

[26] The issue of curriculum materials distribution presented some difficulties in developing these cost estimates. During NEFC consultations, it became clear that provinces expect the national government to meet this cost, while NDoE has issued a policy assigning cost responsibility to provinces.

The *national curriculum materials policy* provides that the national government pays for an initial supply of curriculum materials for all newly established schools. The provincial education office is expected to manage (store and distribute) these materials. Whenever more curriculum materials are needed by a school – either to replace the initial supply or add to it because of increasing enrolments, the provincial government is expected to be responsible for both, paying for, and distributing those additional materials. Although as noted above, many provinces do not accept this responsibility and do not budget for it. The only exception is that NDoE will replace curriculum materials destroyed as a result of a natural disaster.

[27] It's unclear as to who will meet the other 50% of the maintenance costs for primary schools. See also the discussion on the following page relating to local-level government responsibilities in education.

Graph 6: Education sector costs by activity and level



Sum of Cost for each Activity broken down by Level. Color shows details about Level. The data is filtered on Sector/Division, which keeps Education.

Local-level government responsibilities in education

According to the National Education Plan the maintenance of elementary and primary schools is a local-level government responsibility. Local-level government cost responsibilities in the education sector amount to K31 million per year for all LLGs, or 18% of the total sub-national cost of education service delivery. This is based on the DoW and NDoE estimates of maintenance costs for standard school buildings, which are based on a percentage of construction cost. These are indexed for location to incorporate differential maintenance costs in more remote districts. Note that the estimates in the National Education Plan are different. The NEP bases its costing on an annual cost of K250 per classroom in elementary schools, and K1,000 per classroom in primary schools.

The total funding available to local-level governments was around K44 million in 2011. Local-government council allowances and travel costs are estimated to cost almost K57.4 million per year. In our consultations with district administration staff, it was clear that local-governments pay allowances and meeting costs first, before they attempt to meet other service delivery costs. Current funding levels are not even enough to cover the allowances - there is no funding left for most local-governments to meet any of their service delivery responsibilities. In reality, local-governments cannot and do not meet these costs from their existing revenues.

Table 9: Education sector unique activities, cost basis and assumptions

Provincial level activity costs

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
Provincial Education Board	Arrange and support Board meetings	National standard costs plus travel calculation	Assumes 13 members meeting 4 times a year (half public servants/half community reps; half from provincial capital; half from outside provincial capital – proxy median LLG). Meeting lasts 2 days.
Provincial contribution to school operating costs	Meet cost of provincial contribution to school operating costs / education subsidy		
Provincial top-up of teacher leave fares	Teacher leave fare funding shortfall	Estimate of annual leave fare liability less national government contribution (being the national gov't Teachers Leave Fare Grant)	Assumes 1/3 of teachers come from outside of the province and receive a leave fare every 2 years, they travel with 3 dependents with the average cost of the leave fare equal to a return ticket from the provincial capital to Port Moresby.
Curriculum materials supply	Purchase of curriculum materials	No cost estimate, see notes.	Ideally curriculum materials would be replaced, on average, once every 5 years. However the responsibility for providing new/replacement curriculum is unspecified and is, in practice, quite irregular.
	Distribution of curriculum materials	No cost estimate, see notes.	The distribution of curriculum materials is recorded as a provincial responsibility. However given the irregular nature in the procurement of new/replacement curriculum a cost estimate has not been developed for inclusion.
School establishment approval	Process submissions from schools	No unique cost	Receive submissions from schools thru LLG. Assumes cost covered under other school visits.

Activity Name	Activity Description	Input Unit	Costing Assumptions
	Travel to assess school establishment submission.	Travel calculation, province - school site visit	Assumes 1 person from province visits proposed site for 2 days each, and assume that each province has a total of 5% of its school numbers as new schools each year, and there is the same average travel time to reach these schools as this is for existing schools within the province.
	Submission to PEB for approval	No unique cost	Assumes this is covered in regular meetings.
	Presentation to NDOE in POM	No unique cost	Postal charges. Assume postal cost absorbed under administration.
Teacher appointment and deployment	Teacher recruitment	No unique cost	Assume no unique costs for recruiting teachers i.e. no visits to teacher colleges etc.
	Deployment costs (new recruits, promotions, retirement)	Travel calculation Province - LLG	Assume that each year 10% of teachers are from outside the province, and they (2 adults and three children) require travel from provincial capital to median LLG. Once in the province, it is assumed the 10% of teachers and their families travel to the median LLG in each district by public transport.
Payroll administration	Keeping teacher pay roll records; advise to TSC	No unique cost	Assumed to be absorbed under admin.
	Prepare salaries budget	No unique cost	Assumed to be absorbed under admin.
	Present to TSC and supervise entering of teachers data	No unique cost	Fax forms to POM. Assumed to be absorbed under admin. Absorbed under admin.
Education subsidy administration	Pay to schools	No unique cost	Assumed to be absorbed under admin.
Exam administration	Send exams from POM to province	National responsibility	Assume freight costs are a **national** cost.
	Primary (grade 8) exam administration Distribute exams	Travel calculation, province - school	Assumes short (half-day) primary school visit to distribute exams
	Collect exams	Travel calculation, province - school	Assumes short (half-day) primary school visit to collect exams.
	Provincial visit (marking)	Travel calculation, school - province	Assumes 1 marker from each primary (grade 7) school to provincial capital for 5 days; assume all come from median LLG.
		No unique cost	Venue hire – n/a, assumes marking is school based
	Secondary (grade 10) exam administration Distribute exams	Travel calculation, province - school	Assumes short (half-day) secondary school visit to distribute exams
	Collect exams	Travel calculation, province - school	Assumes short (half-day) secondary school visit to collect exams

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
	Provincial visit (marking)	Travel calculation, school - province	1 marker from each secondary/high school to provincial capital for 5 days; assume all come from median LLG
		No unique cost	Venue hire – n/a, assumes marking is school based
	Secondary (grade 12) exam administration Distribute exams	Travel calculation, province - school	Assumes short (half-day) secondary school visit to distribute exams
	Collect exams	Travel calculation, province - school	Assumes short (half-day) secondary school visit to collect exams
Pre-service training (elementary only)	Provide provincial training course	Travel calculation and local costs	Assume 20% of elementary teachers are in training. Assume two courses per year in provincial capital for 3 weeks. Province pays for venue hire, course materials, trainer per diem - but not trainees transport.
	Inspection visit to elementary schools	Travel calculation, province - elementary schools	Assumes province-to-elementary school visits; 3 staff to 20% of schools with each visit lasting 3 days.
In-service training	Provide in-service training	Travel calculation and local costs	Assume 50% of teachers receive 5 day in-service training course at provincial level. Assume costs of providing a trainer are met by NDOE. Costs are refreshments, course materials, per diems. Assumes that high school facilities are used for accommodation and venue.
Secondary school maintenance	Maintain Secondary school buildings **50% of cost**	National standard cost	Assume province meets 50% of the cost of maintaining each secondary school classroom. The cost of maintaining classrooms is based on the per student estimates contained in the 2008 Universal Basic Education Plan (duly indexed).
	Maintain Secondary school buildings **50% of cost**	National standard cost	Assume 50% paid by **other parties** (i.e. not the provincial government).
Elementary school supplies	Procurement of school supplies	Local costs	Assumption of quantity of school supplies required by elementary school students. School supplies are assumed to be: 3 x 96 page exercise books, 6 x pencils and 2 x erasers.
	Distribute supplies to schools	Travel calculation, province – school	Assume that each school receives one distribution of supplies each year, and that distribution vehicle (small truck or chartered air craft) can fit supplies for 6 elementary schools on average.
Primary School Supplies	Procurement of school supplies	Local costs	Assumption of quantity of school supplies required by primary school students. School supplies are assumed to be: 6 x 96 page exercise books, 6 x pens, 6 x pencils and 2 x erasers.

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
	Distribute supplies to schools	Travel calculation, province – school	Assume that each school receives two distributions of supplies each year, and that distribution vehicle (small truck or chartered air craft) travels individually to each primary school.
Secondary School Supplies	Procurement of school supplies	Local costs	Assumption of quantity of school supplies required by secondary school students. School supplies are assumed to be: 9 x 96 page exercise books, 9 x pens, 9 x pencils, 1 arch-lever file and 2 x erasers.
	Distribute supplies to schools	Travel calculation, province – school	Assume that each school receives four distributions of supplies each year, and that distribution vehicle (small truck or chartered air craft) travels individually to each secondary school.

District level activity costs

Payroll administration	School (resumption) visit	Travel calculation, province – school	Short (half-day) visit to each school
Inspection and Advisory (elementary, primary, secondary)	Elementary, Primary and Secondary school inspections	Travel calculation, province – school	Assume inspectors come from District level. National function but partly met by province. Assume province meets one of the three required visits each year. Visits are by one person for one day in each school.
	Elementary coordination and inspection	Travel calculation, province – school	Assume 1 additional visit of 1 person to each elementary school each year.
	Provincial ratings conference	Travel calculation, district – province	Assume 2 staff from each district attends conference at provincial capital once a year for 5 days.
	National ratings conference	National responsibility	Visit to POM. Assume paid for by NDOE
Vocational	Various - but covered under other programs	No unique cost	Assume cost met under other programs
Literacy/non-formal education	Covered under community development	No unique cost	Assume cost met under community development area
CODE (Distance Education)	Various - but covered under other programs	No unique cost	Assume cost met under other programs

LLG level activity costs

Elementary and Primary School Maintenance	Maintenance of school buildings **50% of cost**	National standard cost	Assume LLG meets 50% of the cost of maintaining each elementary and primary school classroom. The cost of maintaining classrooms is based on the per student estimates contained in the 2008 Universal Basic Education Plan (duly indexed).

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
	Maintenance of school buildings **50% of cost**	National standard cost	Assume 50% paid by **other parties** (i.e. not the local level government).

Facility (school) level activity costs

Education Subsidy Administration	Collect and cash cheques	Travel calculation, school to district travel	Cost of travel is met by the school

Note: Activities highlighted in yellow are assumed to be cost neutral. The costs are assumed to be covered under another related activity, or are a national responsibility, or are 'someone else's' responsibility.

7.1.2 Health

Summary

- 2011 sector cost estimate, K123.7 million [2005, K64 million)[28]
- Rural health services are provided at all levels of the sub-national system with a large amount administered at the front line – at the facility level.
- The biggest proportion of the costs (84%) is at the district level – with a large proportion of that being at the facility level.
- Cost drivers: The number and dispersal of health facilities is the factor that most affects the cost of health services.

Methodological note: The existing 2005 and 2011 studies do not address the emergence of the Provincial Health Authority as a modality for administering rural health services.[29]

Emerging Issues

Delivering a rural health service through a highly decentralised system such as Papua New Guinea's is complex and dynamic. The Government's policies and implementation strategies evolve and change over time and the system needs to adapt to complement these changes. Some changes can also directly impact the NEFC's cost estimates as functional responsibilities realign, expand or contract. Recent changes that are likely to impact the cost study include:

- Free health care policy: The recent Government policy on free health care may result in an increase in the funding for facilities. In 2014 the National Government appropriated an additional K20 million as part of its free health care policy.
- Provincial Health Authorities: The number of PHA's is increasing. These entities have a variety of financial issues that need to be resolved if the initiative is to achieve the benefits that are hoped for. The financial arrangements – responsibilities, costs, and funding – need to be clarified and streamlined.
- Church Health Services: CHS is a major participant in rural health in Papua New Guinea. There is a need to clarify the specific responsibilities (and the ensuing funding implications) of church health providers as opposed to the responsibilities that reside with government.

For reasons that have already been stated the initial 2005 O&M costing study concentrated on establishing a cost estimate of the responsibilities of provincial and local level governments only. In the rural health sector it is difficult to isolate the costs of one participant, such as sub-national government, without clarifying and comparing the roles and responsibilities of other major participants. Such is the level of interdependence within the sector that a more holistic view may now be needed. The time may now be right to better understand the specific roles and responsibilities of the various actors that participate in rural health and the alignment of the various financial arrangements that are available to support this critical area. This will involve clarifying the roles of national government, provincial government, provincial health authorities, church health services and facilities. Costs can then be estimated for each function and activity.

[28] These cost estimates exclude the specific costs related to HIV AIDS which can be found in section 7.1.3

[29] The creation of Provincial Health Authorities is likely to see an increase in health administration costs related to the new entity. There may be other changes in how rural health operations are conducted that also have cost implications. There is a pressing need for these implications to be better understood.

This information will then inform deliberations on the efficiency of the existing funding streams.

Discussion

Health is one of the most technically complex services to deliver, and consequently it involves the greatest number of different activities of any of the service delivery sectors. More than 80% of costs in the health sector fall at district level. These relate to patient transfers (K19 million), family health and disease control patrols (K6.5 million), provision of water supplies (K8 million). Operation of rural health facilities and maintenance of medical equipment, and providing radios to health facilities is estimated to cost K6.5 million. Provision of vehicles for outreach activities costs a further K11 million.

LLGs are expected to contribute K2.3 million towards the cost of maintaining and operating aid posts. As noted above in relation to the education sector (section 4.6.5), the vast majority of LLGs do not have the resources to meet even a small proportion of these costs.

At the provincial level, the main activities are supervision (of district offices and health facilities) and training. The cost of supplying drugs and equipment to health facilities is also paid for at the provincial level, but is not as major an expense as might have been thought – although this cost increases significantly when supplies need to be transported by air.

Perhaps the most critical health sector activity is the conduct of district patrols by health centre staff. These health patrols take nurses and community health workers into remote areas to provide a range of services, including immunisation of children, disease control (provision of bed nets), nutrition awareness and the clinical supervision of aid posts. The cost of patrols has been developed on the basis of six visits per year which are needed to meet the requirements of key public health programs: immunisation (which requires six visits per year). It is assumed that three staff members travel on each patrol and that each visit is for half a day's duration.

Equal access to health services

The range of these costs is considerable. It costs almost four times as much per head to provide the same level of health services in Manus as it does in Western Highlands. Just because more densely populated areas can be serviced with fewer facilities does not mean that the current number and distribution of facilities gives all people equal access to health services. In reality, there are big differences in access to health services across the country. Populations in some districts have much better access to health facilities than others. The Papua New Guinea Rural Development Handbook shows that the range of access to services by rural Papua New Guineans is considerable.

Ideally, cost estimates should be based on all people having the same access to services. However, this is a difficult thing to calculate. All provinces do not need the same number of facilities per person, again because the same level of access can be provided to people in densely populated areas using fewer facilities, especially if they have good road networks. More work needs to be done to develop a mechanism to adjust costs so that they do not inadvertently lock in inequitable access to services by providing fewer resources to those provinces that already the poorest serviced.

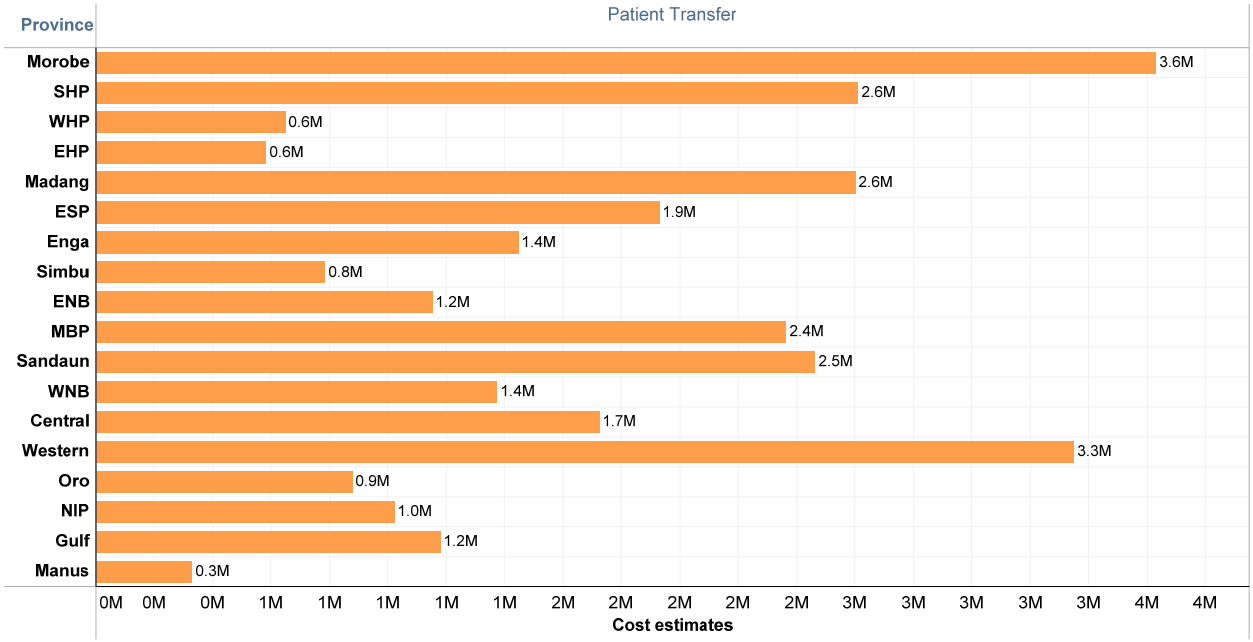
Patient transfer costs as a health proxy for the price of remoteness

Conceptually, the most costly activity in the health sector is patient transfers. This cost is based on the assumption that 1% of the population (60,000 people) require transfer to hospital each year. Each transfer is done as a separate trip. The number of trips per year that will be required in each district is determined by dividing the district population by the number of health centres, to arrive at a district-specific figure of the number of patients that will require transfer per year.

It is assumed that a staff member travels with the patient for each trip. It is also assumed that a relative travels with the patient, although this is only relevant to the cost when air travel is involved.

This assumption was developed on the basis of National Department of Health (NDoH) policy on patient transfers. The original figure provided by NDoH assumed that around 250,000 people (5% of the population) were hospitalized each year. This figure produced a costing in excess of K100 million which would equate to around one fifth of the total cost of provincial service delivery for all sectors in 2005. It was decided that this figure was simply unrealistic given the funding and that a more conservative assumption should be adopted.[30] This highlights the difficulty of costing programs which are largely driven by demand.

Graph 7: Patient transfer costs by province and level



The patient transfer cost estimates reflect both the number of people in a province and their relative remoteness from the provincial hospital. This explains why in Simbu (which is generally less remote) the estimated cost to transfer a patient is K194 whilst in Sandaun (which is generally more remote) the transfer cost is K1,082 per transfer more than five times that in Simbu.

Church health services

Church health facilities are funded through grants from the national government, but they still require medical supplies from and supervision by the provincial health administration in the same way as government-run health facilities. All health facilities were counted in calculating the costs, but funding which comes directly from the national government through church health grants may offset some of these costs.

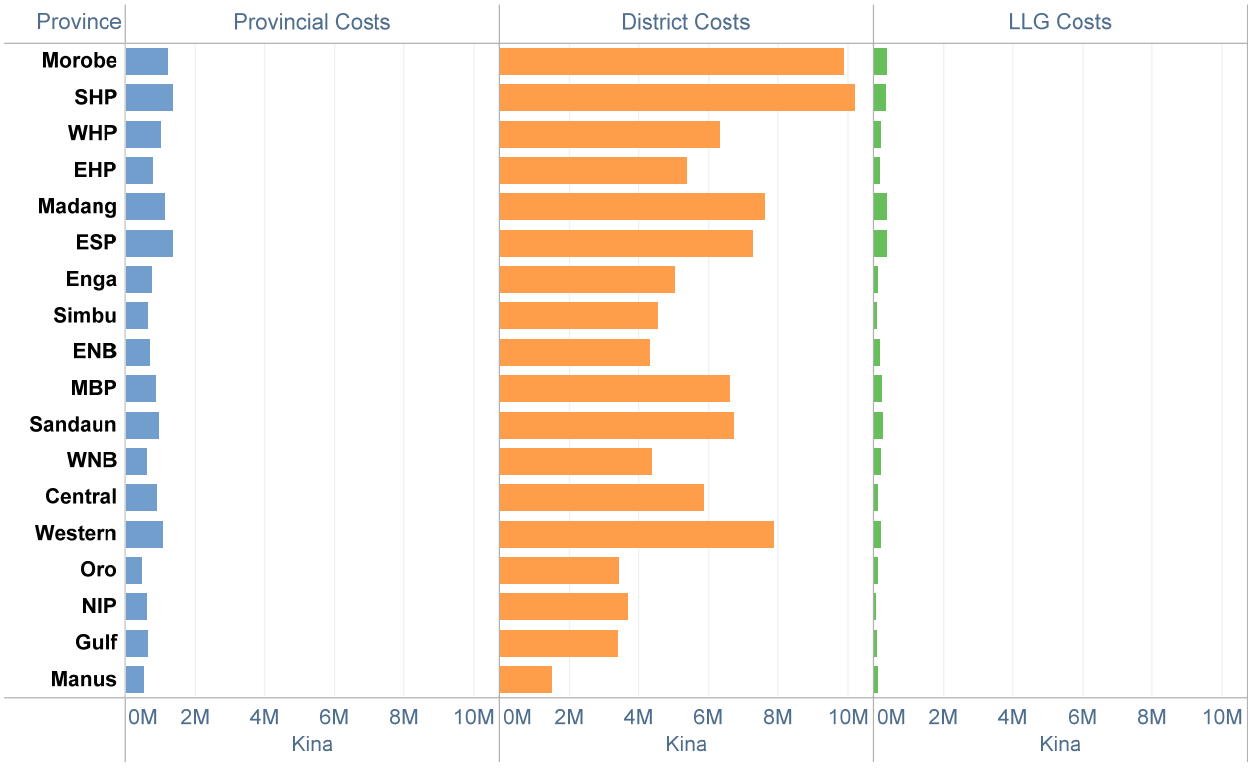
[30] The cost of patient transfer based on 250,000 transfers was unrealistic in the sense that the Government has limited resourcing to commit to service delivery and so all allocation decisions must be viewed in a pragmatic light.

Table 10: Health sector activities by level

Provincial level activities	**District** level activities	**LLG** level activities
K15.8 million	K104.1 million	K3.9 million
Administration Staff Training (HRD) Provincial Health Board Health information system Supervision Disease Control Distribution of Medical Supplies Health Promotion	Administration DHMC Supervision Patient transfer In-Service Training Rural Health Facilities operations Rural Health Centre Transportation Maintenance of Medical Equipment Immunization/MCH Water Supply Health Promotion HC Radios	Aid Posts

The table above lists the activities that are included in the cost study. We can see from the following graph that the majority of health sector service delivery activities that generate costs are at the district level.

Graph 8: Health sector costs by province and level

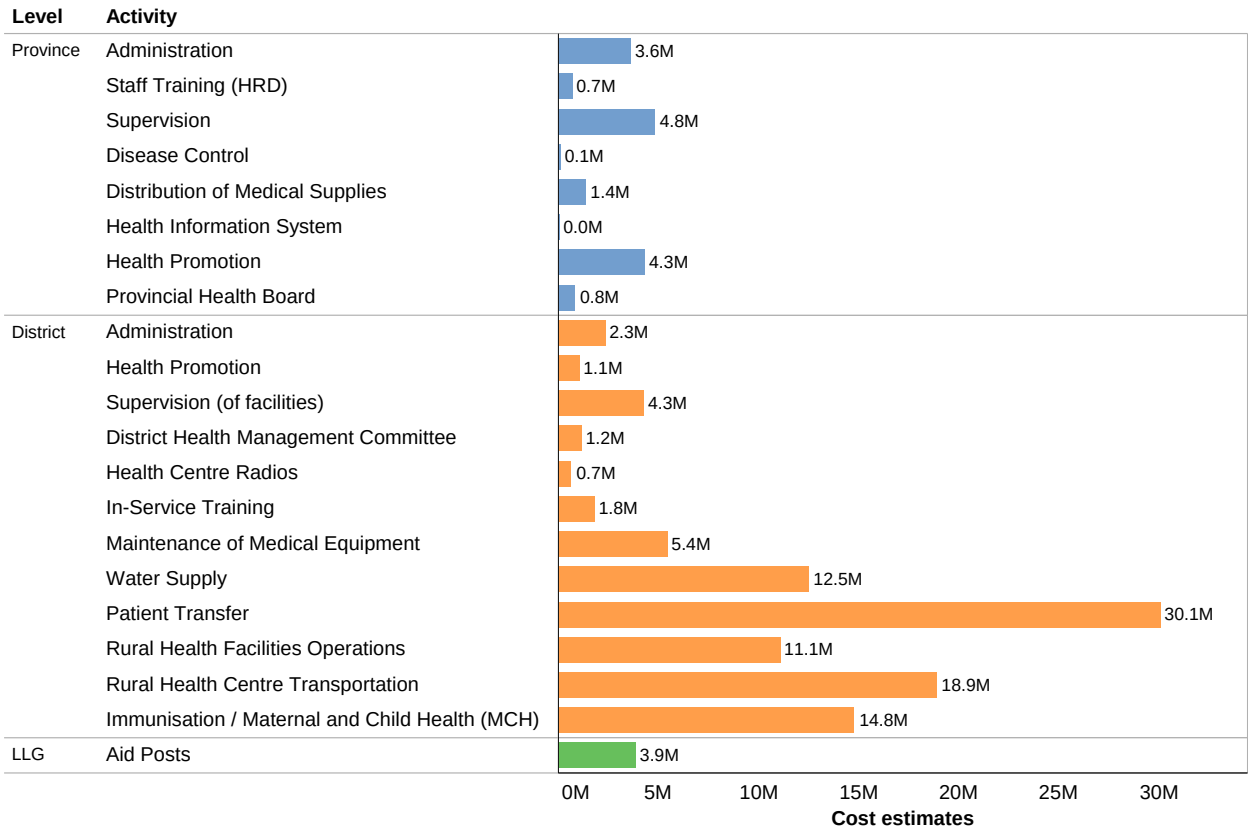


Provincial Costs, District Costs and LLG Costs for each Province. Color shows details about Provincial Costs, District Costs and LLG Costs. The view is filtered on Sector/Division, which keeps Health.

We can see from the following graph that there are many significant activity costs in the health sector. Observations include:

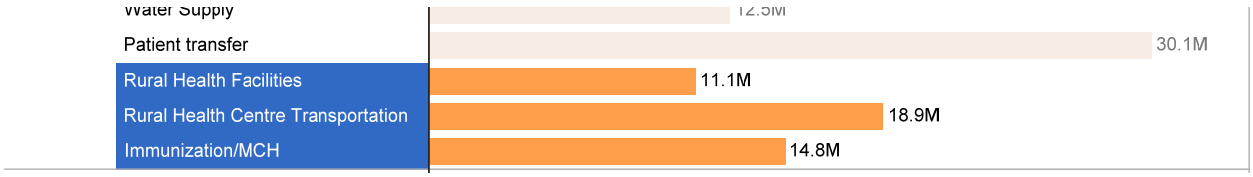
- At the provincial level *supervision* and *health promotion* are significant activity costs. The relative smallness (K1.4 million) of the cost estimate for the *distribution of medical supplies* is also noted.
- The larger activity costs are at the district level, patient transfer being the single largest.
- Supervision is a critical sustaining activity and is present at both the provincial and district levels

Graph 9: Health sector costs by activity and level



Sum of Cost for each Activity broken down by Level. Color shows details about Level. The data is filtered on Sector/Division, which keeps Health.

Graph 10: Facility related costs by activity



Extract from graph above

- Rural facilities (health centres) are at the heart of the rural health system. At least three activity costs relate specifically to health centres being; *rural health facilities (operations), rural health centre transportation and immunization/MCH*. These three costs total K44.8 million being 36% of the sector total. Other costs (patient transfer, maintenance of medical equipment, radio maintenance and in-service training) also relate specifically to operational activities, facility equipment or staff but, it could be argued, may be better managed more centrally.

Table 11: Health sector unique activities, cost basis and assumptions

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
Provincial level activity costs			
Supervision	Management supervision of districts	Travel calculation, province - district visit	Assume provinces conduct management supervision and necessary technical work (e.g. environmental health tasks) in District capital 4 times a year. Assume 4 officers from province travel to each district, for 2 days each quarter.
	Performance review	Travel calculation, health centre-district-province visit	Assume OIC of health centre and District Health Office travel to province 4 times a year for quarterly performance review. Assume only OIC of HC and DHO travel, and review takes one day in provincial capital.
	Clinical team from provincial hospital visit each health centre	Travel calculation, province - health centre visit	Assume 6 people from Provincial Hospital visit each HC once a year for three days for clinical support.
Disease Control	Outbreak management	Travel calculation, health centre visit	It is assumed that 2 health centres would experience a disease outbreak each year. It is assumed that a team of 4 people for 5 days are required to travel to HC level to investigate, and that the HC are evenly spread throughout the province. It is assumed that communication costs are covered under general admin costs, and that any testing supplies are provided in the medical supplies budget (National Government responsibility).
Distribution of medical supplies	Distribution of medical supplies from province to district to health centre	Travel calculation, province - health centres	Assume distribution occurs from province capital 4 times a year. Distribution route/mode advised by province - based on most economical route from provincial capital to each Health Centre. Assume distribution vehicle (be that banana boat, small aeroplane, or 4WD) travels separately to each health centre.
Health information system	Monthly reports from HC to province	No unique cost	Assume no unique cost. Costs such as post and travel are assumed to be covered under other forms of travel - supervision, quarterly reviews etc.
	Send to POM	National standard cost	Monthly DHL package province to POM
Health Promotion	Dissemination of print materials	Local cost	Printing of 2 x A4 colour leaflets per year for 25% of provincial pop. Distribution to health centres is via medical supplies distribution process, and to households via patrols/clinics (hence no unique cost for distribution).
	Radio spots	National standard cost	Assume 10 x 30 second ads per day for 100 days per year

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
Provincial Health Board	Arrange and support meetings	National standard cost plus travel calculation	Assume 12 members; 50% public servants; 50% outside members; assume outside members drawn equally from throughout province; 4 meetings per year; 1 day duration; costs are travel, per diem, sitting fees, stipend and lunch. Assume no venue hire.
Environmental Health	Check town sewerage, fishing boats etc.	No unique costs, province - district	Assume no unique costs. Assume limited to provincial capital and district centres. Provincial based inspections covered in provincial admin cost, and district based visits covered in supervision visit listed above.
	Inspection of food markets and shops	No unique costs, province - district	As above
	Water quality testing	No unique costs, province - district	As above

District level activity costs

Supervision	Combined general/technical/ program, supervisory visit District to HC	Travel calculation, district-health centre	Assume Districts conduct combined management/technical supervision of HC 4 times a year. Assume 5 officers from District travel to each HC for 2 days.
	Aid post supervision visit	No unique costs, health centre - aid post	Assume this occurs during the scheduled 6 visits per year made by the HC to provide public health outreach services (see below). Hence no unique cost for this activity.
Disease control	Village based outreach, (e.g. bed net distribution, DOTS , case finding, contact tracing)	No unique costs, village visits	Assumed to be covered by aid posts and clinic visits - hence no unique costs. Additional costs of contact tracing for STIs/HIV are included under HIV.
Distribution of medical supplies	Distribution of medical supplies from HC to AP	No unique costs, health centre - aid post	Assumed that distribution occurs during clinic visits - hence no unique costs
District Health Management Committee	Arrange and support meetings	National standard cost plus travel calculation	Assume 6 members; 3 public servants; 3 outside members; assume outside members drawn equally from throughout district; 4 meetings per year; 1 day duration; costs are travel, per diem, sitting fees, stipend and lunch. Assumes no venue hire.
Radios	Regular maintenance of all radios	National standard cost plus travel calculation	It is assumed that regular radio maintenance costs equals 5% of the indexed 2005 capital cost for spare parts. It is further assumed that each year 10% of health centres required a visit each year for specific repairs per year. One technician travels from the provincial centre for 2 days to each HC to undertake the repair. Assume other maintenance is covered in general supervisory visits.

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
Radios	Emergency maintenance of radios	National standard cost	It is assumed emergency radio maintenance costs equals 5% of the indexed 2005 capital cost for spare parts. It is further assumed that each year 10% of health centres required a visit each year for specific repairs per year.
Health Promotion	Local groups activities	National standard cost, village grants	It is assumed that each year, 5% of villages in the province receive a community grant of K1,000 for local level health promotion/improvement activities each year, and that these grants are managed thru NGOs who use part of the grants to provide and monitor the grants.
In-service training	Conduct in-service training for service delivery staff District Training Course	Travel calculation and local costs	Assume 50 % of health workers from health centres and aid posts receive 5 days in-service training per year at district level. Assume in any given year the trainees are drawn equally from HC throughout the province. Assume half of participants need to travel from LLGs, class size of 20, and 2 trainers travel from province HQ.
Water supply	Establish new tank based water supply system villages each year	Asset procurement - water supply system	It is assumed that each year, 5% of villages in the province receive a new water supply system. For costing purposes, it is assumed that the system is a tank based system that is adequate to provide water for 300 people. It is assumed that the villages are equally spread throughout the province.
Patient Transfer	HC to provincial capital emergency transfer	Travel calculation	Assume that 1% of the population would be expected to require hospitalization each year for the priority health care programs provided at rural health centres. This expected number has been apportioned to each province based on population to arrive at an expected number of cases to be transferred to hospital in each province. It is assumed that within each province, the number of expected cases is equally distributed between health centres. The cost of transfers (paid for by province) only includes one-way transport for the patient and one relative. All other costs are borne by the hospital or the patient and are not cost in this model.
Rural health facility operations	Health centre non-medical supplies	Basket of local costs	Assume each HC requires the following non-medical supplies: 1,000 litres of diesel fuel for generator, 200 litres of kerosene, 18 litres of bleach, 120 cakes of soap, 1 mop and 1 bucket. The amounts of each item have been worked out based on actual consumption of these items of a well-resourced (with user fees) Urban Health Centre in ENB that is seeing 30,000 outpatients per year. This figure of 30,000 contacts per year equates to the 'ideal' catchment population for a HC in the NDoH minimum standards of 10,000 and 3 outpatient contacts per year.

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
Rural health facility operations	Patient books	National responsibility	Health centre patient books are assumed to be a national responsibility.
	Maintenance of health centres including furniture and fittings	National standard cost	The allocation is based on a HC of average size per the 2009 Monash/ADB study (duly indexed).
Maintenance of medical equipment in health centre	Maintenance of medical equipment in HC	National standard cost	For health centre medical equipment, it is assumed an average cost allocation per year is required to maintain a list of equipment deemed necessary for the health centre to operate to the sectors minimum standard. This costing was undertaken by NDoH in 2009 and has been duly indexed. Any travel costs associated with medical equipment maintenance is assumed to be covered by the general supervisory visits which includes provision for a biomedical technician.
Rural Health Centre Transportation	Provide transport access to clinic extension points	Local costs of procurement and maintenance	Each health centre is provided with a vehicle or a boat (or both) where necessary to access clinic points and to transport patients. The costs are: depreciation on vehicle/boat (over 7 years), maintenance costs, and a fuel allowance.
Immunization / MCH	HCs collect vaccines	No unique costs, province - health centre	Assume vaccines are required to be supplied to the HC every two months (6 times per year). It is assumed that this supply is covered in other province to district trips (such as; supervision, quarterly reviews, and medical supply distribution trips) and hence there are no unique costs provided for in the cost study.
	Fridge repair / maintenance & operating costs	National standard cost	The fridge repair/maintenance allocation is a weighted average that reflects the differing fridge types used in HCs and their prevalence (gas, kerosene, electric & solar) per the 2009 Monash/ADB study. Operating costs of a gas fridge is cost of 10 x 13kg bottles of gas per annum. It is assumed that 25% of fridges are each type, and that solar fridges have no operating costs (as in original 2005 study), while electric and kerosene running costs are covered under non-medical supplies (kerosene and diesel).
	Mobile Clinics / Outreach	Travel calculation, health centre - clinic site visits	The study assumes mobile clinics from HC are held at sites (census units) which are chosen to be within 2 hours travel time for the population within the HC catchment area. It is assumed that these clinic points need to be serviced by health staff at least 6 times per year to meet the requirements of the key public health program particularly immunization which requires 6 contacts per year per child to be fully immunized. Other public health programs require less intensive contact than that and hence are assumed to be met by the 6 visits per year requirement.

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
			Assume each clinic lasts half a day and that 3 HC staff travel for each clinic if travel is by vehicle, or if it is a walking clinic, then an additional three staff/casuals travel as carriers.
	School visits	Travel calculation, health centre - schools	The study also assumes the health centre staff visit each school in the catchments area once a year. This is in addition to the clinic sites and that each school clinic lasts 1 day with three staff.
	Village Birth Attendant Program District Training	Travel calculation and local costs	Assume 50% of HC in each province have VBA program consisting of 20 VBA/VHV per HC, and that they receive 2 days of training per year at District level. Assumes half the participants come from the median LLG in the district by public transport and are reimbursed for their travel costs.
		National responsibility VBA/VHV kits	Assume each VBA receives 20 replacement birthing kits each year (which consist of large plastic sheet, 2 pieces of string, new razor blade, pair gloves, small piece of soap, 6 pieces of gauze). The cost of this is provided by the national government under the medical supplies budget.

LLG level activity costs

Aid Posts	Non-medical supplies for aid posts	Basket of local costs	It is assumed that aid post require 10% of the cost of non-medical supplies provided to HC. (NB: annual HC costs are 200 litres of kerosene, 18 litres of bleach, 120 cakes of soap, 1 mop and 1 bucket)
	Maintenance of medical equipment	National standard cost	The model adopts the 2009 NDoH recommended allocation as used in the National Health Plan. Duly indexed.
	Maintenance of aid posts facility (incl. furniture and fittings)	National standard cost	The model adopts the 2009 NDoH recommended allocation as used in the National Health Plan (and 2009 ADB/Monash study). Duly indexed.

Note: Activities highlighted in yellow are assumed to be cost neutral. The costs are assumed to be covered under another related activity, or are a national responsibility, or are 'someone else's' responsibility.

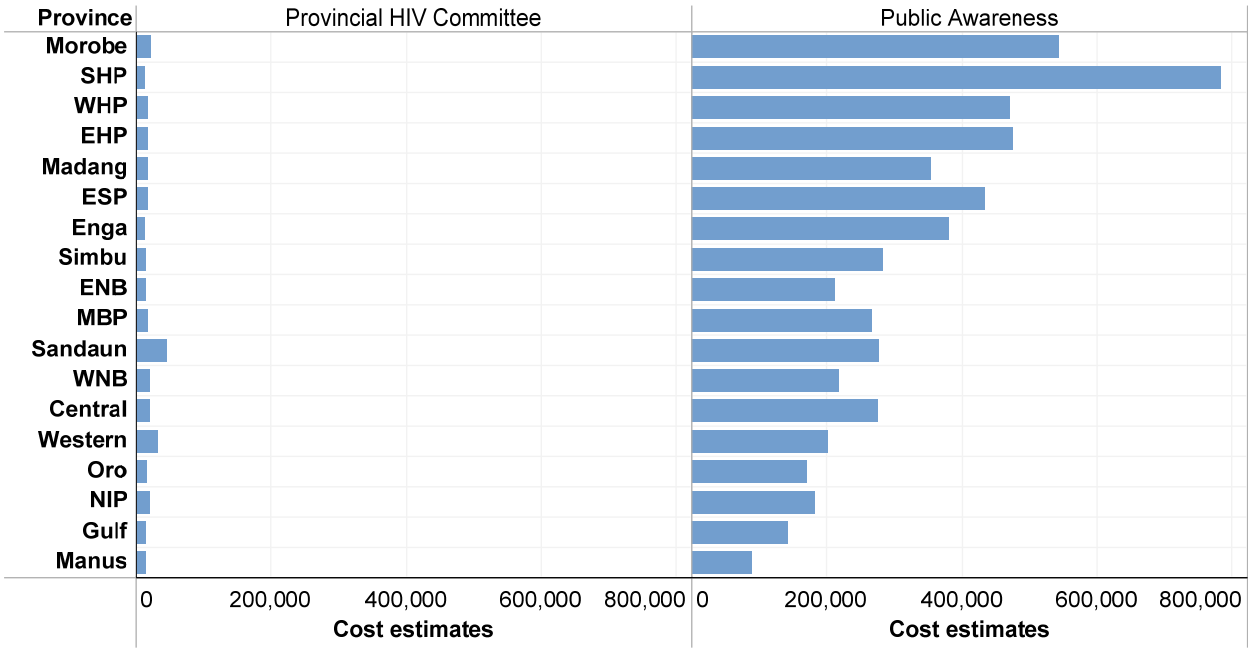
7.1.3 HIV AIDS sub-sector

Summary

- 2011 sub-sector cost estimate, K6.3 million [2005, K4.9 million)
- Rural health services are provided at all levels of the sub-national system with a large amount administered at the front line – at the facility level.

The following graph illustrates the activity costs that were identified and costed in the HIV AIDS sub-sector.

Graph 11: HIV AIDS sub-sector costs by province



Sum of Cost for each Province broken down by Activity. Color shows details about Level. The data is filtered on Sector/Division, which keeps HIV. The view is filtered on Activity, which keeps Provincial HIV Committee and Public Awareness.

Observations include:

- Both of the activity costs are at the provincial level.
- A relatively modest amount is estimated necessary to support the Provincial HIV Committee.
- The major activity cost relates to public awareness activities.

Table 12: HIV sub-sector unique activity inputs and assumptions

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
Provincial level activity costs			
Provincial HIV Committee	Arrange and support meetings	National standard cost plus travel calculation	Assume 12 members; 1/2 public servants; 1/2 outside members; assume outside members drawn equally from throughout province; 4 meetings per year; 1 day duration; costs are travel, per diem, sitting fees, stipend, lunch. Assume no venue hire.
Public Awareness and condom distribution	Health Promotion	Local costs	Assume 2 x A4 pamphlets (colour) to 25% of population per year, distribution by all sectors (hence no extra cost)
		National standard cost	Assume 100 days per year, 30 second 5 times a day
		National standard cost, community grants	Assume grants provided to 10% of villages per year at K1,000 each (the 2005 allocation was maintained)
	Outreach visits	Travel calculation, province-schools	Assume 10% of schools visited per year; 0.5 days in each school plus travel time; Assume schools are in median LLG.
	Health Centre/Aid Post distribution	No unique costs, travel province-health centre-aid post	Assume condoms/health promotion materials distributed under health sector costing
Training	Health Staff	No unique costs, training courses	Assume covered under health training
	Community Counsellors Training courses	Travel calculation and Local costs	Assume 2 course per year per province; 20 participants held at province level. Assume participants come from median LLG

Note: Activities highlighted in yellow are assumed to be cost neutral. The costs are assumed to be covered under another related activity, or are a national responsibility, or are 'someone else's' responsibility.

7.1.4 Infrastructure

Summary

- 2011 sector cost estimate, K179.9 million [2005, K119.7 million)
- Infrastructure is the most expensive sector comprising about 25% of all costs within the study
- Most of the activity costs relate to the routine maintenance of public assets[31]
- Cost drivers: The main driver of costs in this sector are the number (and/or size) of provincial public infrastructural assets such as; the length of roads, the number of rural airstrips, bridges, wharves, jetties and landings. The more assets the more cost.

  A second cost-category is the operational costs relating to communications and power supply for district administration centres. Costs under this category are driven by the type of telecommunication and power infrastructure that is available at a district centre.

The state of public transport infrastructure assets in provincial Papua New Guinea

The estimated cost for road maintenance is based on the cost of annual routine maintenance only. This is an extremely conservative assumption. In fact, a large proportion of the road network has deteriorated to the point where routine maintenance is not possible.

The state of public transport infrastructure assets in provincial Papua New Guinea

When transport infrastructure is neglected and left to degrade the price the country will ultimately pay to rejuvenate these extravagantly expensive assets is colossal. One sector expert advised that the reconstruction of public assets can be 40 to 130 times more expensive than the annual cost of routine maintenance.

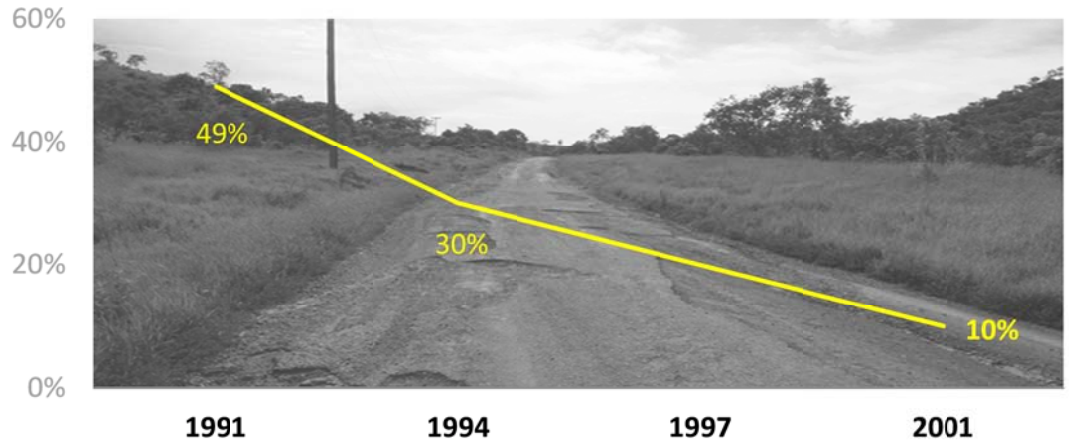
The reality in Papua New Guinea is that many roads, particularly provincial roads, are in a poor condition. The effect of time, weather, use and little or no maintenance means routine maintenance is insufficient, major maintenance and rehabilitation is now necessary. The result is that the routine maintenance costs NEFC estimates in this study will often be inadequate in the first instance. Provinces will need to spend much more to restore the roads to a maintainable level.

A World Bank Sector Review Note undertaken in November 2003 estimated that 46% of the national road network and two-thirds of the provincial road network requires rehabilitation. Even spread over an eight year period, the report concluded that this was unaffordable for the Government. It should be noted that the estimates about the proportion of the road network that is in poor condition was based on those roads actually surveyed and entered into the RAMS database in 2002. It is probable that the better roads were surveyed first, and so the proportion of roads in poor condition may have risen since that time.

[31] Maintaining infrastructure is expensive, if assets are left to degrade due to inadequate maintenance the cost of more significant maintenance (sometimes referred to as rehabilitation) becomes extravagantly expensive. This study costs only routine maintenance which assumes infrastructural assets are in an acceptable state of repair. We know in practice this is often not the case.

The RAMS database is the only source of information on the state of individual roads. Any cost estimate of capital (rehabilitation) costs would need to be based on this information. It is as yet incomplete, despite substantial efforts in the early 2000's to collect this information. In the absence of any accurate source of information on capital cost for roads, it was determined to estimate only the annual recurrent cost. It is just as important to establish this figure as it is to determine what the capital cost is. The reason Papua New Guinea's roads are in such bad condition is due to chronic under-funding of annual maintenance. The World Bank Sector Note calculates that maintenance funding was less than 50% of what was needed from 1991, and since 1994 it fell to less than 30% of need. In 2001 the Note estimated maintenance funding was at only 10% of what was needed. Unless adequate provision is made for recurrent funding of road maintenance in future budgets, the cycle of rebuilding and deterioration is certain to continue.

Graph 12: The historic decline in spending on road maintenance 1991-2001



Data source: World Bank, 2003

Identifying who is responsible for maintaining sub-national roads

Following on from the 1995 Organic Law reforms, it was intended that the different levels of government would take over responsibility for different components of the road network. Provincial governments and Local-level governments were each intended to receive an unconditional infrastructure grant and be responsible for maintenance of infrastructure. In the roads sector, the clarification of which roads were the responsibility of which level of government depended on classifying roads as either national (national NDoW responsibility), provincial truck roads and district feeder roads (provincial responsibility) or local access roads (local government).[32]

Unfortunately, the majority of roads other than national roads were not classified. More than half the 11,000 kilometres of road identified as non-national during the original cost of services study in 2005 are unclassified. This category includes estimates of unsurveyed provincial or local roads that are included in the RAMS database, and a number of roads that were separately identified during the course of the costing study in interviews with district staff in the 2005 exercise.

32 Note that national roads are classified into national route, national main, national district and national institutional sub-categories.

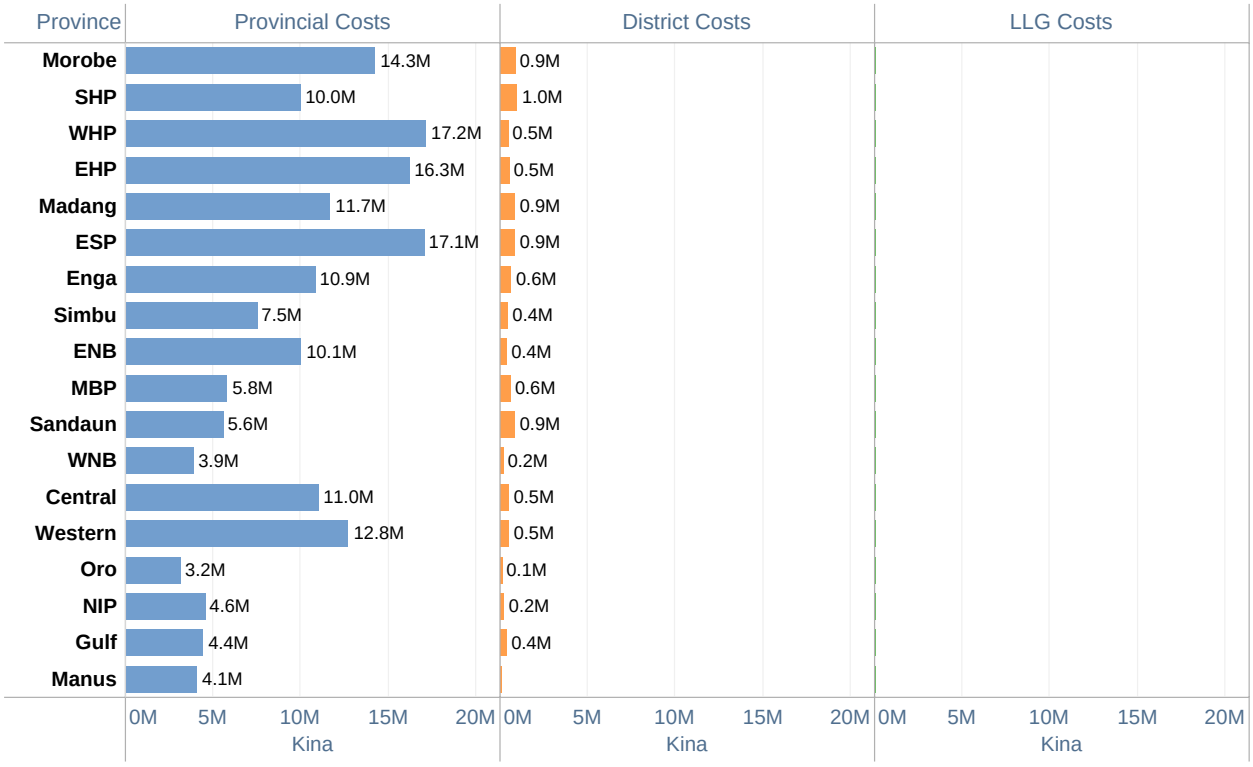
Without this classification information, it was not possible to separate out the road maintenance costs for provincial, district and local levels. For this reason, all the costs of road maintenance (other than national roads) were assumed to be assigned to the provincial government level. This has a significant impact on the total cost which falls at the provincial level. However, it is also important to consider capacity issues. Some district administrations and many local-level governments may not have the capacity to administer road maintenance contracts unless they are very basic. The early experience, and difficulties, of districts seeking to implement DSIP projects may be evidence of the varied capacity constraints at the district and LLG levels.

Table 13: Infrastructure sector activities by level

Provincial level activities	**District** level activities	**LLG** level activities
K170.5 million	K9.4 million	-
Administration Staff Training (HRD) Transport Authority Policy Development Rural Airstrips maintenance Wharf, Jetties and Landings maintenance Bridge maintenance Road maintenance	Administration District Communication Rural Electricity	None

The table above lists the activities that are included in the cost study – most activities relate to the maintenance of infrastructural assets.

Graph 13: Infrastructure sector costs by province and level



Observations include:

- Most costs are recorded at the provincial level – it is assumed that most routine maintenance is coordinated and funded from the provincial level.
- The majority of the infrastructure sector costs relate to the maintenance of assets, so there is a direct causal relationship between assets and costs; i.e. the more roads, bridges and jetties a province has the higher its costs and the more it needs to spend each year on basic maintenance.

We can see from the following graph that most significant activity costs in the infrastructure sector relate to routine maintenance. Observations include:

- The estimated cost of routine road maintenance dominates the infrastructure sector.
- Other sizable costs are routine bridge maintenance and rural electricity.[33]

Graph 14: Infrastructure sector costs by activity and level

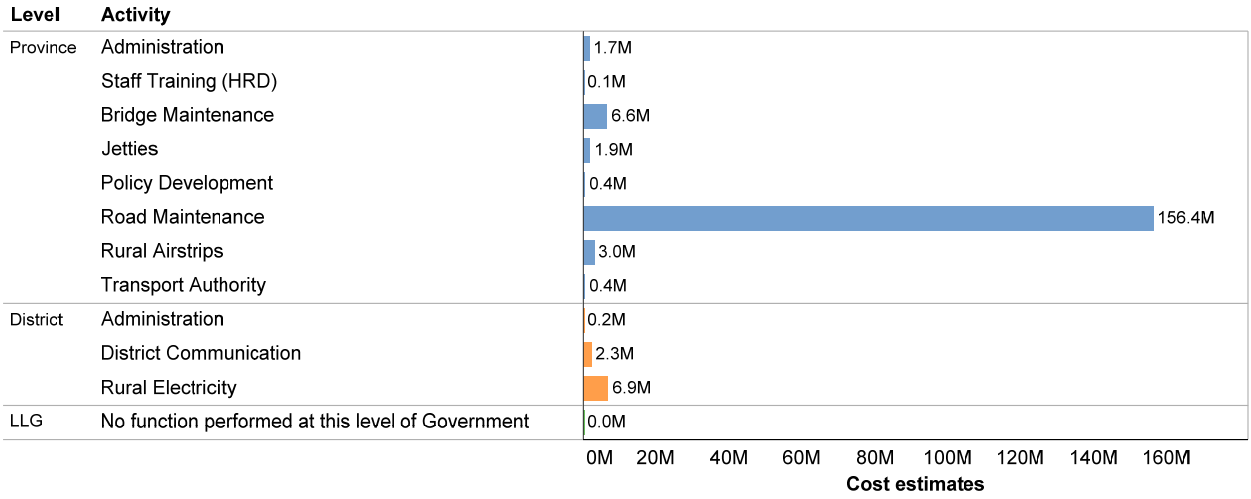


Table 14: Infrastructure maintenance unit costs

Cost type Routine maintenance only	**Unit**	**Unit cost 2005**	**Unit cost 2011**	**Basis for adjustment** 2005 to 2011
Rural **Airstrips** maintenance	per annum per airstrip	K6,000	K8,453	Indexation
Wharf maintenance	per annum per wharf	K20,000	K28,176	Indexation
Jetties maintenance	per annum per jetty	K10,000	K14,088	Indexation
Landing maintenance	per annum per landing	K5,000	K7,044	Indexation
Bridge maintenance	per annum per bridge	K10,000	K14,088	Indexation
Road maintenance – **sealed**	per km of road	K7,500	K22,500	Latest DoW report[34]
Road maintenance – **unsealed**	per km of road	K10,500	K15,000	Latest DoW report

[33] Rural electricity refers to the cost of providing power to the district administration centre. See the infrastructure sector table of activity inputs and assumptions on the following pages.

[34] Road maintenance costs are from a 2011 Department of Works RAMS unit costing report on national roads. This was the best information available for use in the 2011 study. The original 2005 cost of services study based its unit cost for road maintenance on a 2000 sector report (by WD Scott) commissioned jointly by the Department of Works and the ADB, this report was considered together with industry consultations in arriving at the 2005 unit costs.

Table 15: Infrastructure sector unique activities, cost basis and assumptions

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
Provincial level activity costs			
Policy Development/ Project Management	Project management	Travel calculation, province - district	Travel to identify potential projects and monitor existing contracts. Assumes that 2 staff travel to each district twice a year to identify potential projects and 2 staff visit each project twice a year for 3 days in a monitoring capacity.
Transport Authority	Arrange and support meetings	National standard cost plus travel calculation	Assumes 8 members; 50% public servants; 50% outside members; assume outside members drawn equally from throughout province; 4 meetings per year; 1 day duration; costs are travel, per diem, sitting fees, stipend and lunch. Assumes no venue hire.
Road Maintenance	Maintain road infrastructure	National standard cost = km's of road x unit cost	The maintenance cost is a simple calculation involving the kilometres of road in a province and a standard cost for routine maintenance. Length: The network of provincial roads was determined in the original 2005 study using information from the Department of Works Road Asset Management System (RAMS) database on the quantity of roads to be maintained in each province. This data has been adjusted where appropriate, based on interviews with provincial public servants on the extent and quality of the road network in each district. Unit Costs: Refer to the table earlier in this section on infrastructure maintenance unit costs. There are separate unit costs for routine maintenance of sealed and unsealed roads.
Bridge Maintenance	Maintain bridge infrastructure	National standard cost = number of bridges x unit cost	The maintenance cost is a simple calculation involving the number of bridges in a province and a single standard cost for routine maintenance. The network of provincial roads was determined in the original 2005 study using information from the Department of Works Bridge Asset Management System (BAMS) on the quantity of bridges to be maintained. Unit Costs: Refer to the table earlier in this section on infrastructure maintenance unit costs.
Airstrip Maintenance	Maintain rural airstrips	National standard cost = number of airstrips x unit cost	The maintenance cost is a simple calculation involving the number of airstrips in a province and a single standard cost for routine maintenance. The network of rural airstrips was determined in the original 2005 study.

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
Jetties	Maintain landings, wharves and jetties	National standard cost = number of waterway structures x relevant unit cost	The maintenance cost is a simple calculation involving the number of landings, wharves, and jetties in a province and the relevant standard cost for their routine maintenance. The network of provincial roads was determined in the original 2005 study using information from the Department of Transport Information from the Department of Transport on the number of landings, jetties and wharves in each province (includes maintenance costs). Unit Costs: Refer to the table earlier in this section on infrastructure maintenance unit costs.

District level activity costs

Rural Electricity	Cost of providing electricity to district administrations	National standard cost and/or Local cost	Where the district centre is connected to PNG Power standard assumptions apply re: average cost of electricity per staff member. Where the district centre has a generator of less than 200KWh (approx. 120KvA) it is assumed to operate at an efficiency of 0.3 litres of diesel per KWh (generators greater than 200KWh are assumed to consume 0.4 litres per KWh). Where generator size is not known or not operational District is assumed to operate a 100KWh generator. Assume average daily usage of 200KW, additional costs include cost of oil, and the cost of maintaining the generator and transmission lines.
District HQ Communication	Cost of providing communication services to District centre	National standard cost	Where district centre is connected to Telikom/mobile the standard assumptions apply regarding average cost of phone service per staff member. Satellite phone: If it does not have a Telikom/mobile or radio service (see below) it is assumed to have a satellite phone with costs assumed to include; handset maintenance, network access fee, Pantel licence and call costs.
	District Radio (where applicable)	National standard cost plus travel calculation	It is assumed that regular radio maintenance costs equals 5% of the indexed 2005 capital cost for spare parts. It is further assumed that each year 10% of districts required a visit each year for specific repairs per year. One technician travels from the provincial centre for 2 days to each district to undertake the repair. Assume other maintenance is covered in general supervisory visits.

Note: Activities highlighted in yellow are assumed to be cost neutral. The costs are assumed to be covered under another related activity, or are a national responsibility, or are 'someone else's' responsibility.

7.1.5 Primary Production – Agriculture sub-sector

Summary

- 2011 sub-sector cost estimate, K41.4 million [2005, K23 million]
- Most sub-sector activities and costs are at the district level (93%)
- Cost drivers: Population alone is not an accurate driver of cost in this sub-sector. The main drivers of costs in this sector are **travel costs** and the **number of farmers**. Extension services are more expensive to provide in provinces with widely dispersed populations, where agricultural extension staff have to travel long distances to reach farmers.

The main agriculture service delivery activity is extension services, which are provided at district level. This involves visiting extension points to speak to farmers, provide them with materials, and provide advice on farming techniques and marketing. In most parts of Papua New Guinea, agricultural extension services are not being provided to all farmers. Because of inadequate funding for the costs of extension officers' travel, many district extension officers do very little extension work these days. The costing study therefore had to determine a methodology for costing what it would cost if these services were actually being provided.

> *"In most parts of Papua New Guinea, agricultural extension services are not being provided to all farmers. Because of inadequate funding for the costs of extension officers' travel, many district extension officers do very little extension work these days."*

The costing study has assumed that all farmers in Papua New Guinea are within two hours walk of an extension point where they can access these services. Because services are not currently being delivered to most of these extension points, the study could not use actual points of service delivery as the basis for working out their location. Instead, a methodology was adopted by which made assumptions about travel involved in visits by public servants to villages or households. The study identified a network of 'extension points' at which villages or households could access services provided by a public servant on a patrol. This estimated the location and number of each extension point using GIS and census data to ensure that all households or villages are within a two hour walk of an extension point.[35] These extension points provide an equitable basis for village-level service delivery locations to which the sectors with an outreach function are assumed to deliver their services. The estimated cost of providing extension services accounts for more than 52% of the total cost for this sector (K21.8 million per year for the whole of Papua New Guinea).

[35] This methodology involved using straight line distance on GIS generated maps for each Papua New Guinea province to approximate 2 hours walking distance. GIS straight line distance is likely to be less than actual distance – due to topography and the fact that walking paths rarely go in straight lines - the study (based on a number of empirical studies in Papua New Guinea) assumed there is approximately a 30% difference between straight-line GIS distance and actual distance. Hence the study assumed that in flat terrain (less than 500 metre elevation), 5 km straight-line distance on the GIS would equate to approximately 6.6 km in actual distance, which would take about 2 hours to walk. In more mountainous terrain (more than 500 metres elevation), 3.4 km in straight line distance on the GIS would equate to approximately 4.4 km in actual distance, which would take about 2 hours to walk.

Obviously the assumed walking speeds are also averages – some will walk faster, but others (particularly the sick or carriers) will walk somewhat slower, and that some areas will have barriers (such as rivers) and others will not. The study chose walking as the mode of transport to locate these extension points as this is the main form of transport in much of rural population, and particularly for the poor (who may not be able to afford PMV fees even if there were a functioning road and public transport).

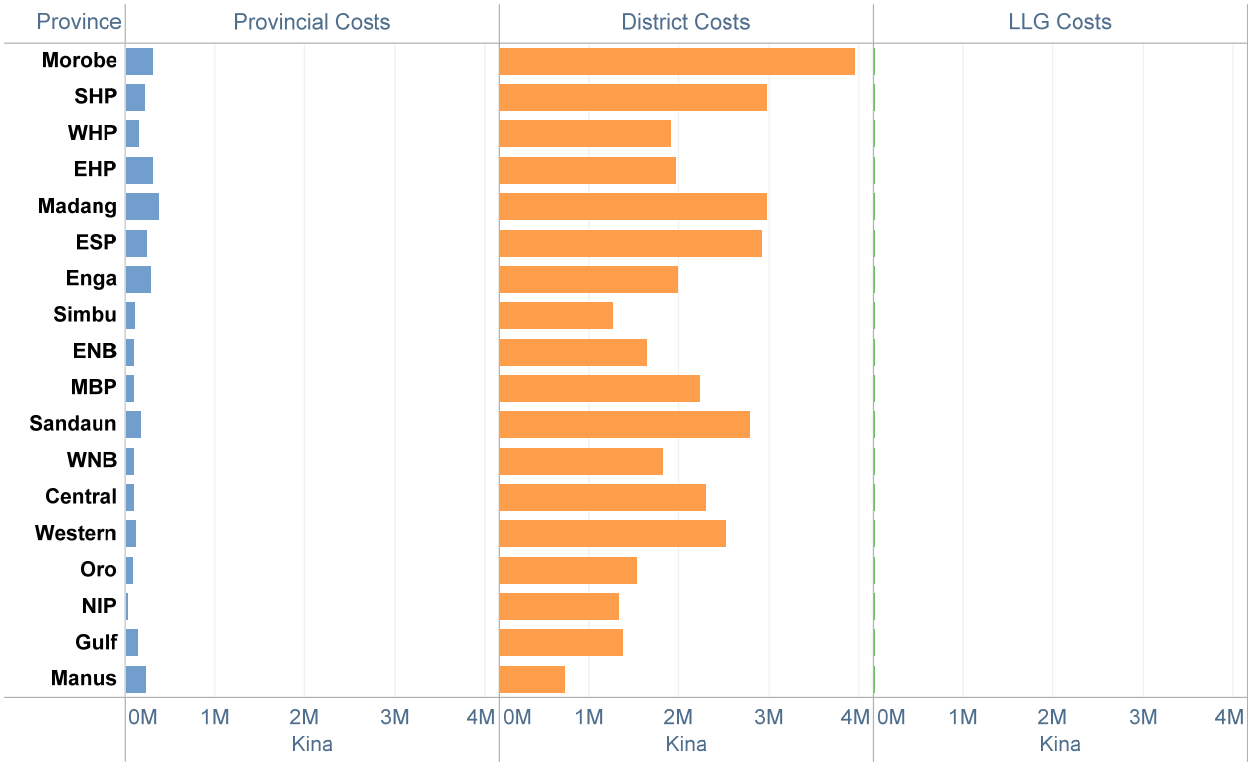
A further 32% of the cost in this sector (K13.5 million) is accounted for by the provision of farmer training and information awareness. The remainder of the costs relate to administration, supervision (of lower-level staff), human resource development (staff training), and activities associated with marketing and quality assurance for cash crops. The table below lists the activities that are included in the cost study. No costs have been identified as a responsibility of the LLG level.

Table 16: Agriculture sub-sector activities by level

Provincial level activities	**District** level activities	**LLG** level activities
K3.1 million	K38.3 million	0
Administration Staff training (HRD) Supervision	Administration Extension Services[36] Farmer Training[37] Information and Awareness	No function performed at this level of Government

We can see from the following graph that the majority of agriculture sub-sector service delivery activities that generate costs are at the district level. Costs at the provincial level, such as supervision, are important but are relatively small in comparison.

Graph 15: Agriculture sub-sector costs by province and level



Provincial Costs, District Costs and LLG Costs for each Province. Color shows details about Provincial Costs, District Costs and LLG Costs. The view is filtered on Sector/Division, which keeps Agriculture.

[36] The activity extension service's is identified as a minimum priority activity (MPA) for the primary production sector and the agriculture sub-sector. This means extension services are a priority activity and the expectation is that provinces funded these activities first.

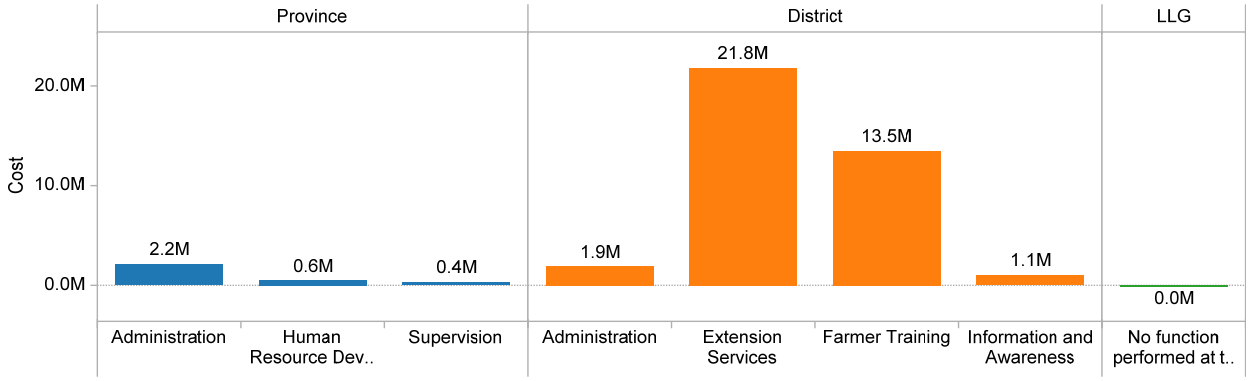
[37] Arguably, the farmer training activity is another form of extension work and so the costs for both extension services and farmer training may together comprise the MPA.

We can see from the following graph that two district level activities which are at the heart of service delivery require the most funding;

- Extension services K21.8 million
- Farmer training K13.5 million

The other costs identified in the sub-sector – such as administration, HRD, supervision and information and awareness – are relatively small in comparison.

Graph 16: Agriculture sub-sector costs by activity and level



Sum of Cost for each Activity broken down by Level. Color shows details about Level. The data is filtered on Sector/Division, which keeps Agriculture.

The table that follows details the thinking behind the individual activities that have been identified and included in the cost study in the agriculture sub-sector. Generic activities and inputs can be viewed in section

Table 17: Agriculture sub-sector unique activities, cost basis and assumptions

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
Provincial level activity costs			
Supervision	Management supervision of district staff	Travel calculation, province - district	Assume three provincial staff visits each district for 2 days 4 times a year.
District level activity costs			
Extension Services	Combined extension visit	Travel calculation, from district/LLG to extension points	Assume quarterly visits to LLG extension points (to proxy a rural outreach). At these points "lead farmers" are trained/ supported to provide extension to other farmers. Assume 4 officers travel to these points (to cover content areas of extension, including livestock) 4 times a year from either LLG or District (depending on where staff are provided). Travel mode is advised by district. Assume each visit takes travel time to destination plus 3 days for service/information provision at point.
	Seed/ tool distribution - farmers and schools	National responsibility	Assume cost of seeds/demonstration materials are provided by Commodity Boards/National Department of Agriculture and Livestock.

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
District level activity costs			
Farmer Training	Training of farmers	Travel calculation and Local costs	Training courses in LLGs Assumes; 10 % of farmer headed households per year; spread across province/district; held at LLG, includes only trainer and course costs not participants costs.
Information and Awareness	Dissemination of information	Local costs	Assumes 10% of farmer households receiving 2 A4 colour leaflets per year. The leaflets are distributed through extension services (i.e. an absorbed cost).
	Field Days	Travel calculation and National standard cost district - LLG travel	Assume 1 Field Day in each LLG each year of 3 days duration. Cost is travel of district staff to LLG (4 for 3 days). Assume K200 for demonstration materials.
Processing	Rice and Copra Mills	N/A	Assume self-financing - no unique costs
	Subsidising farmer transport costs	N/A	Assume self-financing - no unique costs

Note: Activities highlighted in yellow are assumed to be cost neutral. The costs are assumed to be covered under another related activity, or are a national responsibility, or are 'someone else's' responsibility.

7.1.6 Primary Production – Fisheries sub-sector

Summary

- 2011 sub-sector cost estimate, K8.2 million [2005, K4 million]
- Most sub-sector costs are at the district level (83%)
- Cost drivers: The main cost drivers in this sub-sector are the **number of fishermen and women**, and the **amount of coastline** in a province.[38]

The fisheries sub-sector is an area where provincial needs vary. Some provinces have far more coastline and many more fishermen and women than others. The estimation of each provinces' requirement for fisheries extension services uses two main factors: the first being the number of coastal extension points and the second the number of fishermen and women, as recorded in the 2000 census.

The two main activities covered by this sector are advice and extension services to new fisher-men and women (K3.1 million) and fisher training (K2.9 million). The remaining costs are mainly associated with administration costs, including monitoring and enforcement.

[38] It is more expensive to provide extension services to fishermen and women dispersed over a large area. Variations between provinces also reflect the extent to which the provincial population is dependent on fishing. The provinces with the highest costs associated with the fisheries sector are hardly surprising given the majority of the population lives along coastal areas. While the Highlands provinces have a very small number of people that are identified as fishermen and women in the census, it is nevertheless assumed that training and assistance are provided to them.

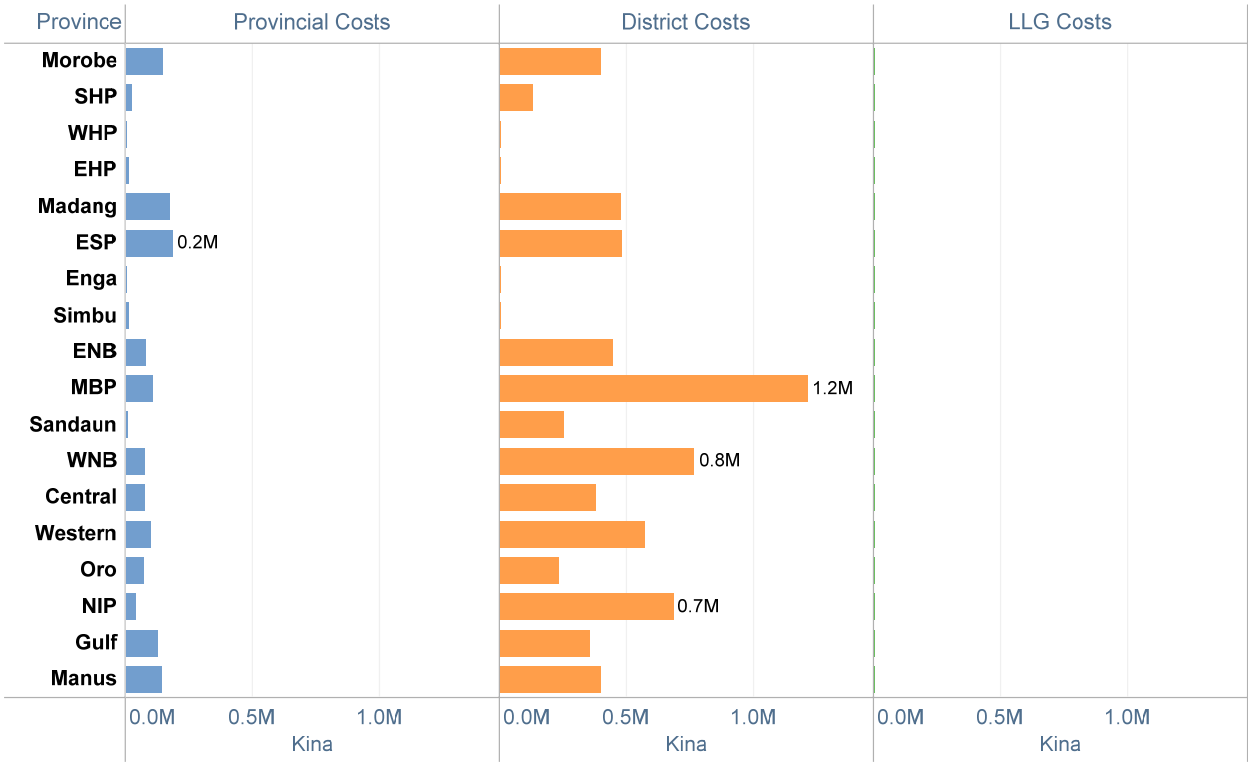
The table below lists the activities that are included in the cost study. No costs have been identified as a responsibility of the LLG level.

Table 18: Fisheries sub-sector activities by level

Provincial level activities	**District** level activities	**LLG** level activities
K1.4 million	K6.8 million	0
Administration Staff training (HRD) Supervision	Administration Monitoring and Enforcement Advice & extension to new fishers[39] Training at LLG centres[40]	No function performed at this level of Government

We can see from the following graph that the majority of agriculture sub-sector service delivery activities that generate costs are at the district level. Costs at the provincial level, such as supervision, are important but are relatively small in comparison.

Graph 17: Fisheries sector costs by province and level



Provincial Costs, District Costs and LLG Costs for each Province. Color shows details about Provincial Costs, District Costs and LLG Costs. The view is filtered on Sector/Division, which keeps Fisheries.

[39] The activity extension service's is identified as a minimum priority activity (MPA) for the primary production sector including the fisheries sub-sector. This means extension services are a priority activity and the expectation is that provinces funded these activities first.

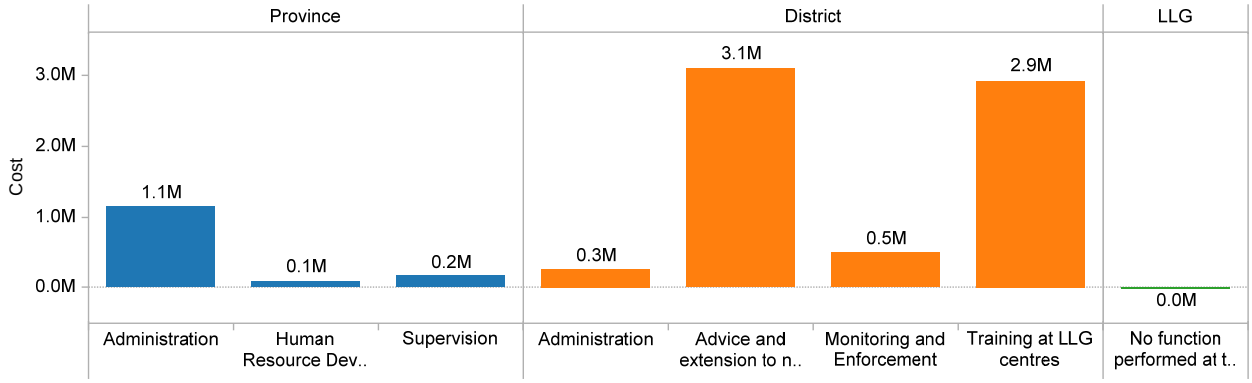
[40] Arguably, the training at LLG centre activity is another form of extension work and so the costs for both advice and extension for new fishers and training at LLG centres may together comprise the MPA.

We can see from the following graph that two district level activities which are at the heart of service delivery require the most funding;

- Advice and extension to new fishers K3.1 million
- Training at LLG centres K2.9 million

Of the other activity costs identified in the sub-sector supervision from the provincial level and monitoring and enforcement at the district level are smaller in quantum but key sustaining activities.

Graph 18: Fisheries sub-sector costs by activity and level



Sum of Cost for each Activity broken down by Level. Color shows details about Level. The data is filtered on Sector/Division, which keeps Fisheries.

The table that follows details the thinking behind the individual activities that have been identified and included in the cost study in the fisheries sub-sector. Generic activities and inputs can be viewed in section

Table 19: Fisheries sub-sector unique activities, cost basis and assumptions

Activity Name	Activity Description	Cost Basis	Explanation of Cost Assumptions
Provincial level activity costs			
Supervision	Supervision support for district fisheries office	Travel calculation, province - district	Assume 2 officers from province travel to each coastal district 4 times a year for 2 days
District level activity costs			
Monitoring & Enforcement	Awareness and monitoring of local private fisheries	Travel calculation, district - LLG	Assume visit to each coastal LLG once per year (2 officers, 2 days)
Advice and extension to new fishers		Travel calculation, from district/LLG to extension points	Assume quarterly visits to the coastal village extension points. Assume 2 officers travel to these points 4 times a year from either LLG or District (depending on where staff are provided). Travel mode is advised by district. Assume each visit takes travel time to destination plus 3 days for service/information provision.
Training of fisherman	LLG training course	Travel calculation and Local costs	Assumes; 10 % of fishermen/women headed households per year; spread across province/district; held at LLG, includes only trainer and course costs not participants costs.

7.2 Other Service Sectors

7.2.1 Commerce

- Total sector cost, K8.4 million
- Sub-sectors; business development and tourism (incl. cultural events)

Graph 19: Commerce sector and major activity costs by province

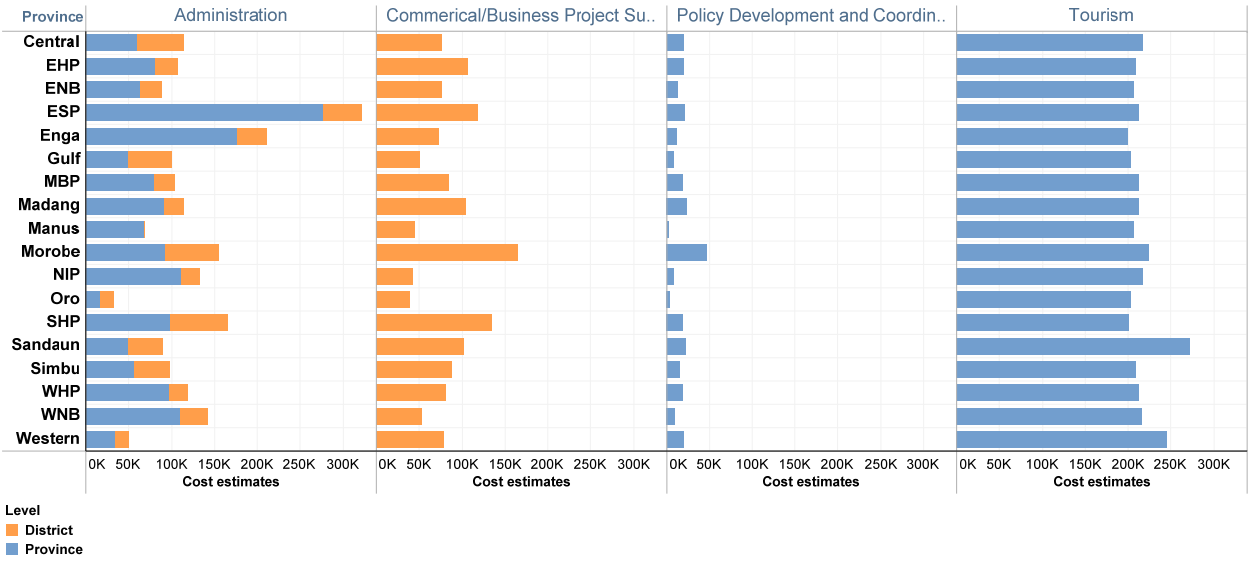


Table 20: Commerce sector unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Business Development**	Identifying new business opportunities, developing proposals etc.	POM Visit	Assume 2 trips to POM for 2 people one week per year
Province	**Policy Coordination**	Supervision	DHQ-PHQ Visits	District Business Development Officers meet quarterly in provincial capital for 1 day.
Province	**Tourism**	Cultural Committee	Meetings	Assume 12 members; 50% public servants; 50% outside members; assume outside members drawn equally from throughout province; 4 meetings per year; 1 day duration; costs are travel, per diem, sitting fees, stipend, lunch. Assume no venue hire.
Province	**Tourism**	Cultural events	Grant	Assume each province runs 2 per year at K50,000 per event (for local dancers, theatre groups etc.). Assume size of grant does not vary with size of province.
Province	**Tourism**	National promotion - POM conference	POM Visit	Assume 1 trip for 4 people for one week to attend conference
Province	**Tourism**	Promotional materials	TV Advertisement (30 seconds); quarter page newspaper advertisement; A4 colour pamphlet.	
Province	**Tourism**	Tourism Committee	Meetings	Assume 12 members; 50% public servants; 50% outside members; assume outside members drawn equally from throughout province; 4 meetings per year; 1 day duration; costs are travel, per diem, sitting fees, stipend, lunch. Assume no venue hire.
Province	**Tourism**	Tourism training for private sector	Courses	2 courses per year, one week, in provincial capital, 20 participants, only cost venue hire, course materials, trainer costs not participants costs. Assume trainers come from provincial capital.
District	**Commerce/ Business Project Support**	Project technical support e.g. SYOB, micro-credit, down stream processing, management training	LLG Visit	Assume each BDO staff from each district make 2 visits per year to each LLG. Each visit consists of two staff and last for 5 days.
District	**Commerce/ Business Project Support**	Training	Training Courses	Assume each district office provides 4 training courses per year in business development areas. Courses held in districts, participants meet their own costs. Training provided by district and provincial staff. Assume 20 participants per course; 5 days per course

7.2.2 Community Development

Summary

- Total sector cost, K12.7 million
- Sub-sectors; child welfare, sports development and youth work

Graph 20: Community Development sector and major activity costs by province

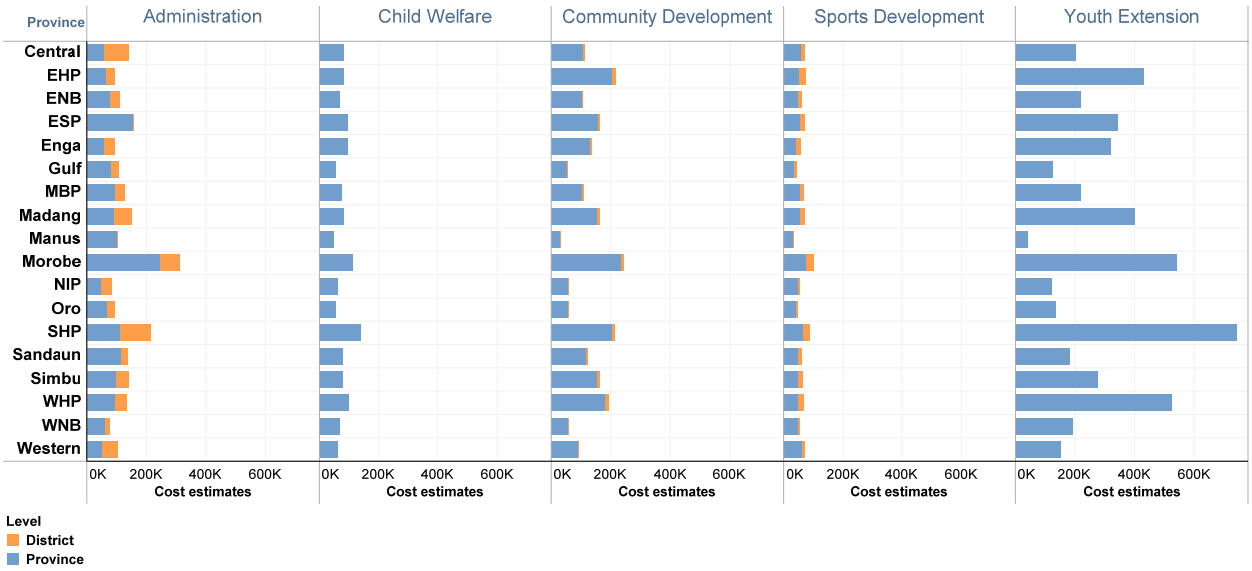


Table 21: Community Development sector unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Child Welfare**	Allowances	K20 per court sitting	1 per district court, 5 cases per year
Province	**Child Welfare**	Training	Training of community counsellors	10 days training per year - venue hire, course materials, refreshments
Province	**Child Welfare**	Dissemination of awareness materials	Print materials; radio spots	Assume reproduction of 2 x A4 pamphlets per year in sufficient quantities to reach 5% of the pop per year (distribution is by other sectors outreach); and assume 30 second radio spots five times a day for 100 days per year (same basis as HIV).
Province	**Community Development /Women in Development**	Grants to NGOs/ community groups	Cost of grants	Assume each district has 1 grant of K25,000 per year (increased from K20,000 in 2005).
Province	**Community Development /Women in Development**	Provincial Youth Council	Meetings	Assume 6 members; 5 from civil society, 1 from public servant, assume civil society representatives drawn equally from throughout province; 4 meetings per year; 1 day duration; costs are travel, accommodation, rations and incidental expenses. Assume no venue hire.
Province	**Sports Development**	Facility maintenance	Grass-cutting, painting goalposts	Assume 2 facilities per province, K7,500 per year per facility
Province	**Sports Development**	Junior Sports Development	School based programs	2 staff visit each district once a year - each visit covers 5% of schools in district for 5 days
Province	**Sports Development**	Training & sports development (e.g. coaching)	Training courses (Two courses held at provincial level each year)	2 courses for 30 participants for 3 days. Course materials, refreshments and venue hire.
Province	**Youth Extension**	Vocation skills training (for out of school youth)	Training courses run out of existing technical vocational colleges	2% of 15-24 year olds receive 3 week course in existing technical vocational schools
District	**Community Development**	Grant monitoring	Extension Point Travel	Assume district officers travel to two extension points within each LLG (one near, one far) each year for 2 days to monitor grant schemes
District	**Sports Development**	Facility maintenance	Grass-cutting, painting goalposts	Assume K1,500 per district per year
District	**Sports Development**	Training courses (one at each district each year)	Number of districts	Course materials, refreshments for 20 people in each district

7.2.3 Correctional Services

Summary

- Total sector cost, K7.1 million
- In 1999 provincial governments were assigned the responsibility to meet a proportion of correctional service costs in their province.[41] The study assumes that provinces meet 50% of the operational costs of feeding and clothing prisoners.
- Provincial governments are responsible for probation services.[42] However there is limited evidence of provincial staffing assigned to fulfil this responsibility. Costs have only been assigned to provinces where provincial staff are employed in probation roles.

Graph 21: Correctional Services sector and major activity costs by province

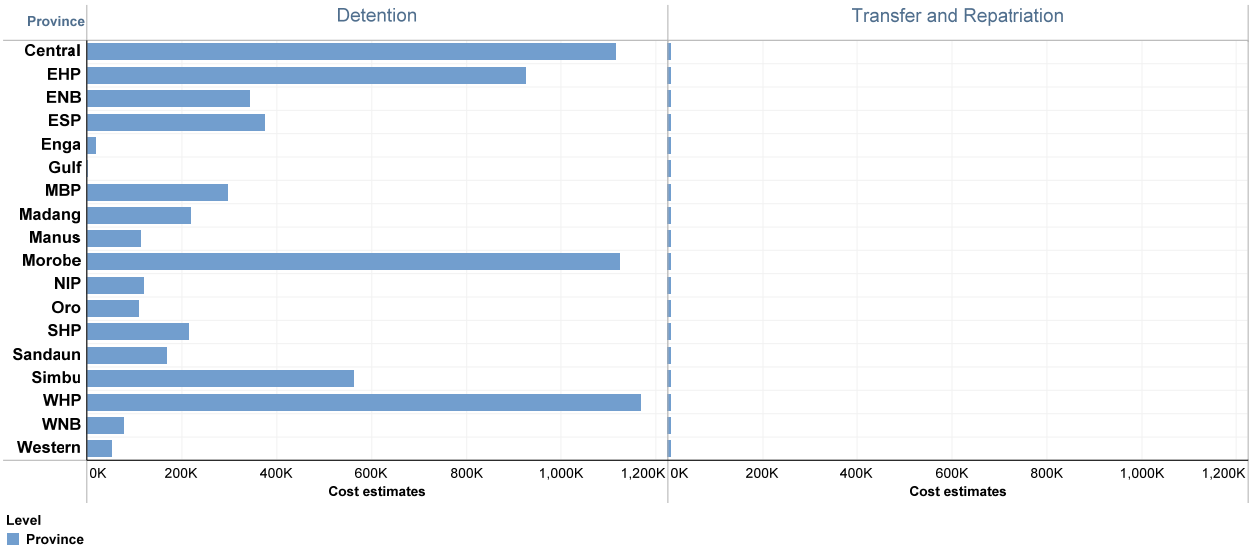


Table 22: Community Development sector unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Detention**	Feeding and clothing prisoners	Rations	Rations per prisoner - navy biscuits, tea, sugar, rice, tinned fish, corned beef, salt NB: Province responsible for 50% of costs
Province	**Detention**		Personal Hygiene	Items per prisoner - disinfectant, steelo pads, toilet paper, razor blades, soap, matches, modess (for female prisoners). NB: Province responsible for 50% of costs
Province	**Detention**		Bedding & clothing	Issues per prisoner - blankets and clothing. NB: Province responsible for 50% of costs
Province	**Transfer and Repatriation**	Repatriating prisoners to home province	Out of province travel	Assumes the 2005 allowance of K5,000 per annum indexed by CPI for 2011 for repatriation costs.

[41] All costs associated with weapons, radios, uniforms and other specialist equipment are assumed to be the responsibility of the national government.

[42] Probation services: administration costs for staff in this sector have only been estimated where a province actually engages staff to provide probation services. A total of only 10 probation staff were identified as employed across six of the 18 provincial administrations. It is assumed that national staff cover the other provinces. Provincial governments also support some welfare services for juvenile detainees. These are assumed to be covered by the community development sector staff.

7.2.4 Environment

Summary

- Total sector cost, K1.8 million
- Provincial governments have a variety of environmental responsibilities.
- In 2011 only six provinces have any provincial staff assigned to the environment area, this number is up from the two staff recorded in 2005.[43]
- All provinces have been assigned costs for a limited environmental activity set.[44] This is on the assumption that activities will be performed by either environment staff or nominated non-environment staff depending on staffing within the province.

Graph 22: Environment sector and major activity costs by province

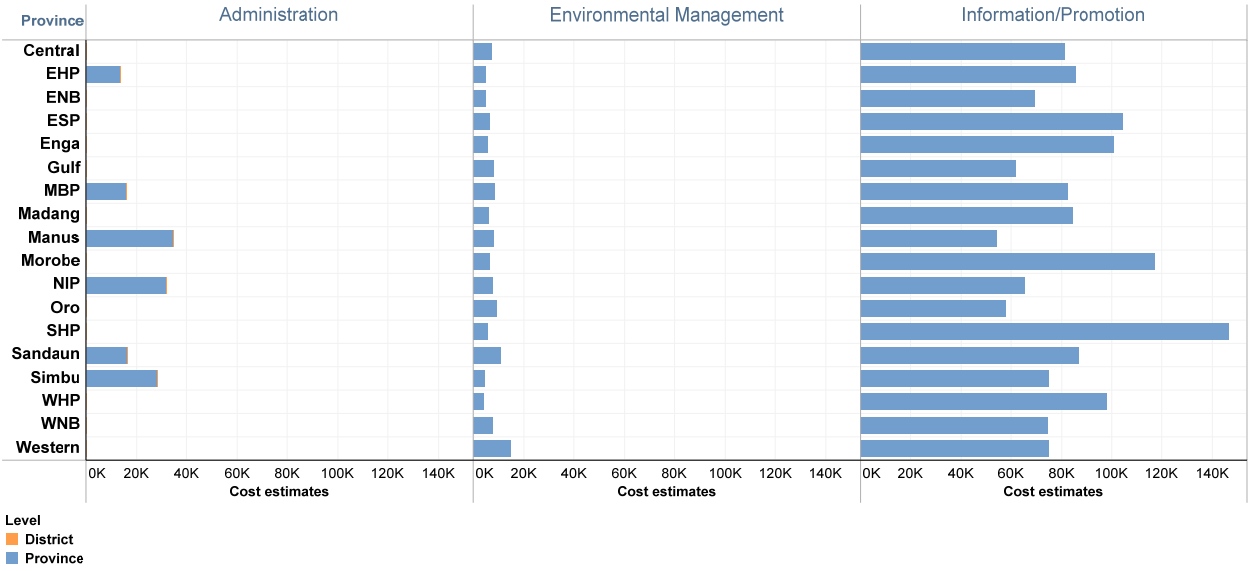


Table 23: Environment sector unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Environmental Management**	Investigate environmental damage	LLG Visit	Assume 2 visits per year per province to median LLG of 5 days duration (plus travel time).
Province	**Environmental Management**	Visit development sites to monitor compliance with management plans	LLG Visit	Assume 6 sites per province (in median LLG); 1 visit per year to each site of 2 days (plus travel time). Assume 2 officers make each trip.
Province	**Information/ Promotion**	Dissemination of awareness materials	Print materials; radio spots	Assume reproduction of 2 x A4 pamphlets per year in sufficient quantities to reach 5% of the pop per year (distribution is by other
Province	**Information/ Promotion**	Environment day	Grant	Assume 5,000 kina per province for local activities - such as local theatre groups etc.
Province	**Information/ Promotion**	Visits to schools	Travel	Assume visit 10% of schools for 1 day (2 people) per year.

[43] However, since the provincial activities in this sector probably do not constitute a full-time job, they may be being carried by staff in other divisions, for example, the office of the Administrator or the Lands office. Accordingly, only the province with a staff member at provincial level (Milne Bay) has a cost estimate for administration.

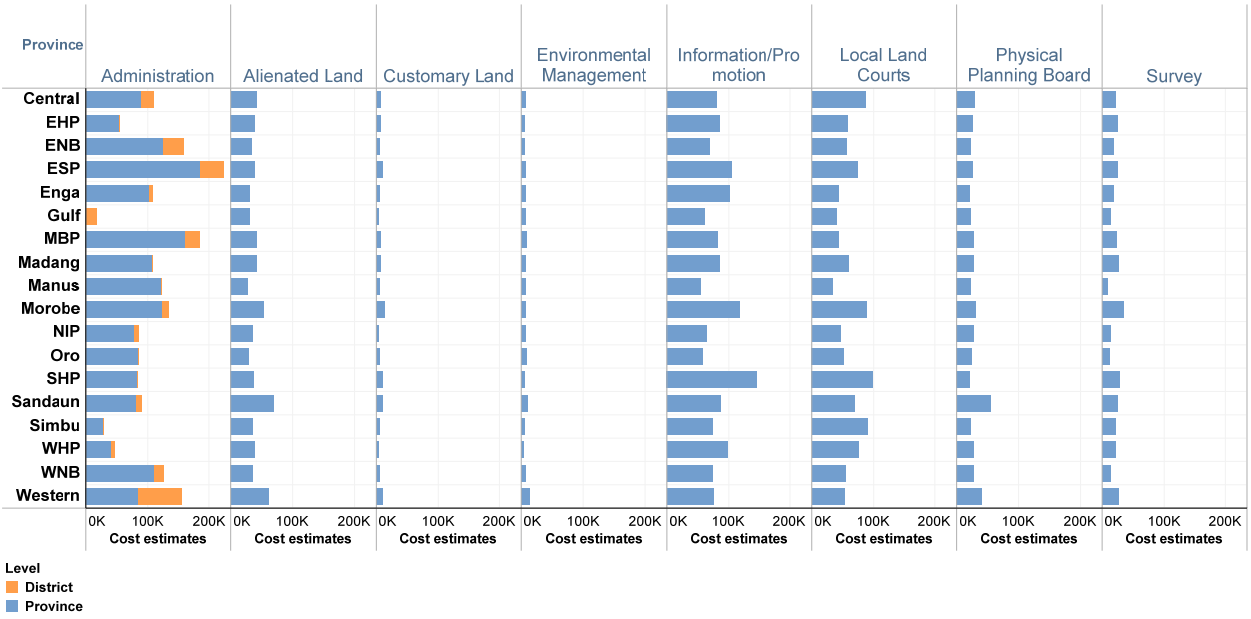
[44] The management of national parks and other protected areas was delegated to provincial governments in 1996. It is not clear whether these functions are actually being carried out in most provinces. The main costs are associated with information and promotion activities (including promotion of International Environment Day), investigation of environmental damage and monitoring. However, recognizing that monitoring activities are largely carried out within specific natural resource sectors, only minimal costing allowance is made for environmental management and monitoring activities.

7.2.5 Land Administration

Summary

- Total sector cost, K4.7 million

Graph 23: Land Administration sector and major activity costs by province



Discussion of activities

Land administration is a national function, but in 1996 the Department of Lands was no longer funded to operate provincial lands offices. Some funding for regional offices remained, but the functions of provincial lands offices became a provincial responsibility. In some provinces, provincial staff were also specifically employed to work in the lands sector. In 2003 the Department of Lands and Physical Planning signed Memorandums of Understanding (MOUs) with a number of provinces setting out their respective roles. Under these MOUs, provincial governments are operationally responsible for:

- Provincial Lands Boards
- Provincial Physical Planning Boards, preparation of development plans and zoning plans for the province, and enforcement of zoning restrictions
- Liaison with customary landowners
- Management of government land including monitoring of use and occupation, land allocation and grant of state leases
- Administration of state leases including collection of land rents
- Liaison in relation to land acquisition
- Surveys for land registration
- Undertaking valuations and maintaining a valuation roll for imposition of local-level government rates

Table 24: Land Administration sector unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Alienated land**	Collection and inspection of lease rentals	District visit	Assume 2 visits per year by 2 staff per district of 3 days duration (plus travel time).
Province	**Alienated land**	Compulsory land acquisition	District travel	(assume covered under lease rental travel)
Province	**Alienated land**	Land Valuation	LLG Travel	Assume 2 visits from Prov to median LLG for 2 people for 2 days
Province	**Alienated land**	Operation of the Land Information System	Computer/ internet access	(assume covered under general administration costs)
Province	**Alienated land**	Provincial Land Board	Board	Assume 12 members; 1/2 public servants; 1/2 outside members; assume outside members drawn equally from throughout province; 4 meetings per year; 1 day duration; costs are travel, per diem, sitting fees, stipend, lunch. Assume no venue hire.
Province	**Customary Land**	Negotiations with landowners	LLG travel	Assume 2 staff travel to half of LLGs each year for 2 people for 2 days
Province	**Local Land courts**	Land Court hearing costs	LLG visit	Assume travel to each district office once per year for 2 days given results of provincial surveys.
Province	**Local Land courts**	Land mediators allowances	Allowances	Annual allowance of K500 per mediator. Ad hoc Land Mediator allowance of K20 per case (assume 1 case per month so that total cost is around one half of full time LMs)
Province	**Physical Planning**	Physical Planning board	Board	Assume 12 members; 1/2 public servants; 1/2 outside members; assume outside members drawn equally from throughout province; 4 meetings per year; 1 day duration; costs are travel, per diem, sitting fees, stipend, lunch. Assume no venue hire.
Province	**Physical Planning**	Provincial capital visits	Provincial capital travel	Assume K5,000 per year for within provincial capital travel
Province	**Survey**	Survey equipment	Costs of survey equipment	Assume annual lump sum of K5,000 for equipment replacement
Province	**Survey**	Survey of alienated land	District visit	Assume 2 visits per year per district of 3 days duration (plus travel time) for 3 people

7.2.6 National Broadcasting Commission

Summary

- Total sector cost, K8.4 million
- NBC is [largely] a national function
- However the costs estimated in this sector reflects the contribution provincial governments may make to the NBC provincial radio stations operating in each province.
- NBC staff are employed by the National Broadcasting Commission and therefore do not form part of the provincial administration.
- The main activities involved in supporting the operation of provincial radio stations are content development (preparation of stories) and operational costs for the radio station. The majority of the costs are associated with running transmitters.[45] These costs are standard across provinces.[46]

Graph 24: Provincial support for NBC – major activity costs by province

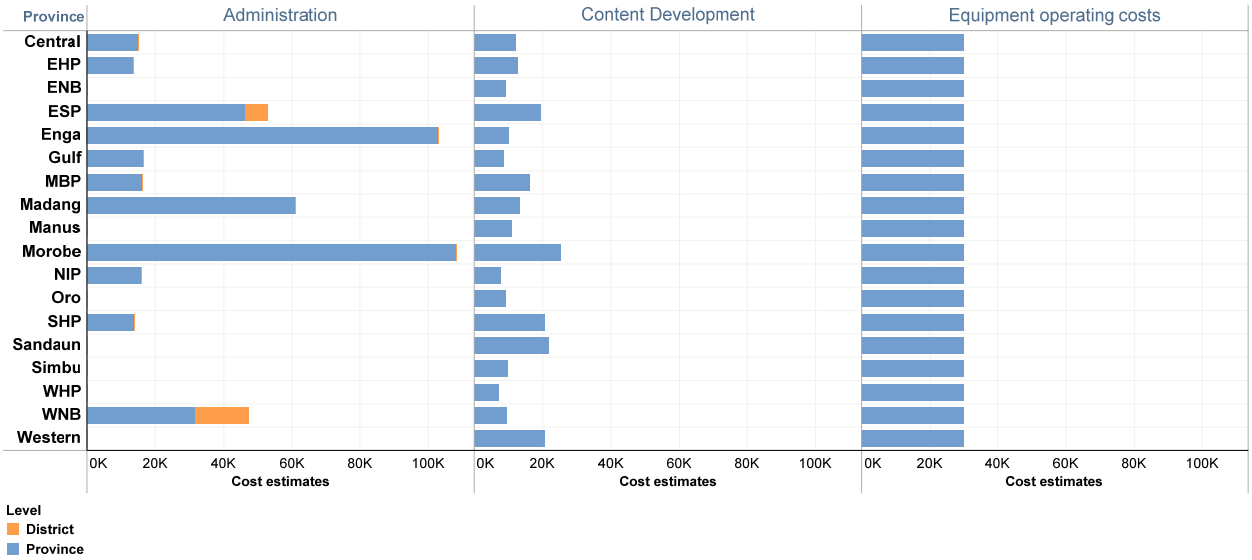


Table 25: Provincial support for NBC – unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Content Development**	Travel	Travel from PHQ-LLGs	Fuel to travel to each LLG once a year (2 people for 2 days)
Province	**Equipment Operating Costs**	Provincial Government Contribution to local NBC studio operating costs	Provincial Government Grant to local NBC studio	K30,000 per year

[45] The original study assumed the costs of operating a single transmitters in each province at K360,000, based on information provided by NBC. This cost is mainly attributable to phone line rental and electricity. The total cost of transmitter operation in 2005 for all provinces was K6.8 million.

[46] New transmitters: Around 2005 the Japanese aid agency JICA has installed a number of new, larger transmitters in some provincial radio stations. The costing study calculated the cost of operating transmitters on the basis of a standard NBC transmitter. There was no information available on the additional cost of operating the new transmitters.

7.2.7 Natural Resource Management

Summary

- Total sector cost, K0.7 million
- In 1999 provincial governments were assigned the responsibility to meet a proportion of correctional service costs in their province.[47] The study assumes that provinces meet 50% of the operational costs of feeding and clothing prisoners.
- Provincial governments are responsible for probation services.[48] However there is limited evidence of provincial staffing assigned to fulfil this responsibility. Costs have only been assigned to provinces where provincial staff are employed in probation roles.

Graph 25: Natural Resource Management sector and major activity costs by province

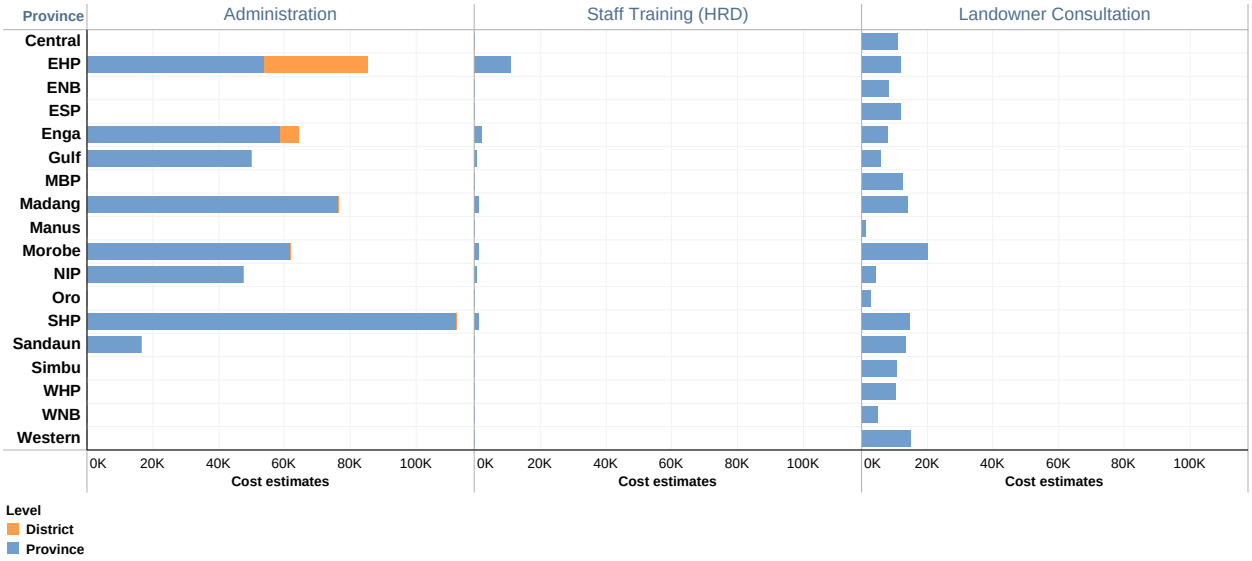


Table 26: Natural Resource Management sector unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Landowner Consultation**	Liaise with landowner representatives	District visit	Assume 2 visits to each district per year by 2 staff per district of 3 days duration (plus travel time).

[47] All costs associated with weapons, radios, uniforms and other specialist equipment are assumed to be the responsibility of the national government.

[48] Probation services: administration costs for staff in this sector have only been estimated where a province actually engages staff to provide probation services. A total of only 10 probation staff were identified as employed across six of the 18 provincial administrations. It is assumed that national staff cover the other provinces. Provincial governments also support some welfare services for juvenile detainees. These are assumed to be covered by the community development sector staff.

7.2.8 Police

Summary

- Total sector cost, K11.2 million
- Policing is a national function, and all police (other than some locally engaged community police) are employed by and report to the National Government.
- Following the 1999 Budget decision on shifting of cost responsibilities to provinces, it has been assumed that provinces contribute to 25% of the operational cost of provincial police operations. The study assumes this applies to the cost of running the Provincial Police HQ (which includes paying utilities, office materials, vehicle maintenance and fuel). The study calculates these costs based on standard unit costs for office operational materials multiplied by police numbers located in each provincial HQ.
- The study assumed that specialist equipment such as uniforms, guns, ammunition and radios are provided by the national government. The costing includes an allocation for fuel, but only to cover essential travel associated with administrative functions. It is assumed that the bulk of the fuel needed for police patrolling operations is provided by the national government. These assumptions were developed in conjunction with the section of the Police Department that is responsible for supplies.

Graph 26: Police sector and major activity costs by province

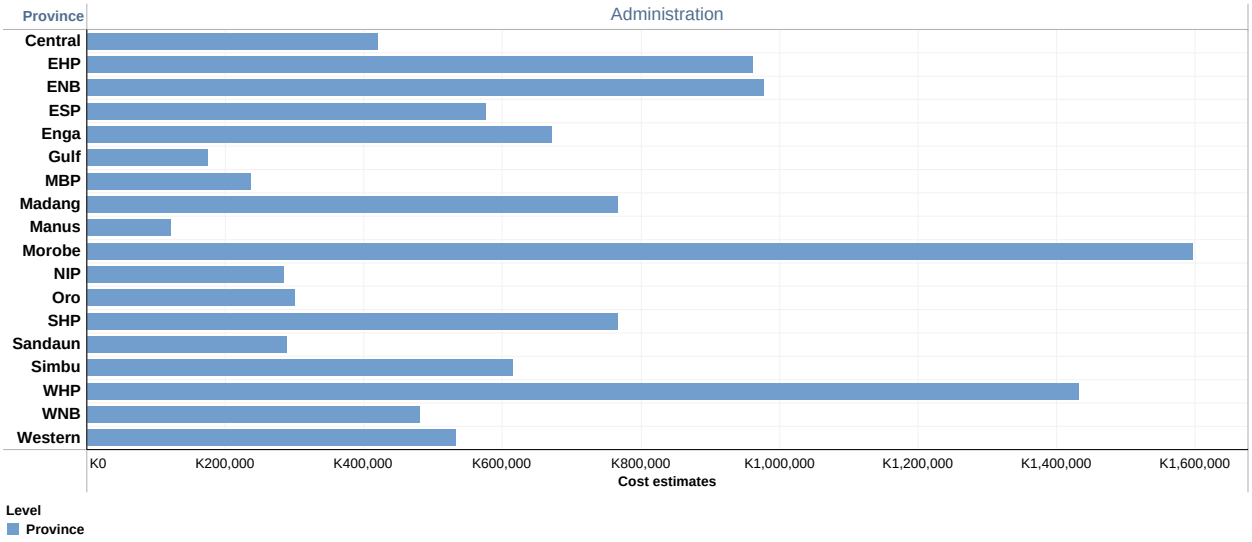


Table 27: Police sector unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Contribution to administration costs for police staff**			Assumes Province pays for 25% of Administration Costs for Police located at Provincial HQ.

7.2.9 Village Courts

Summary

- Total sector cost, K9.3 million
- Although the courts system is a national responsibility, provincial governments have had responsibility for village courts since 1996. In 1995, the allowances for village court officials were budgeted through the Attorney-General's Department, but these became a provincial responsibility after the new Organic Law came into effect.
- The major cost drivers in this sector are the number of village courts and the number of officials.

Graph 27: Village Court sector and major activity costs by province

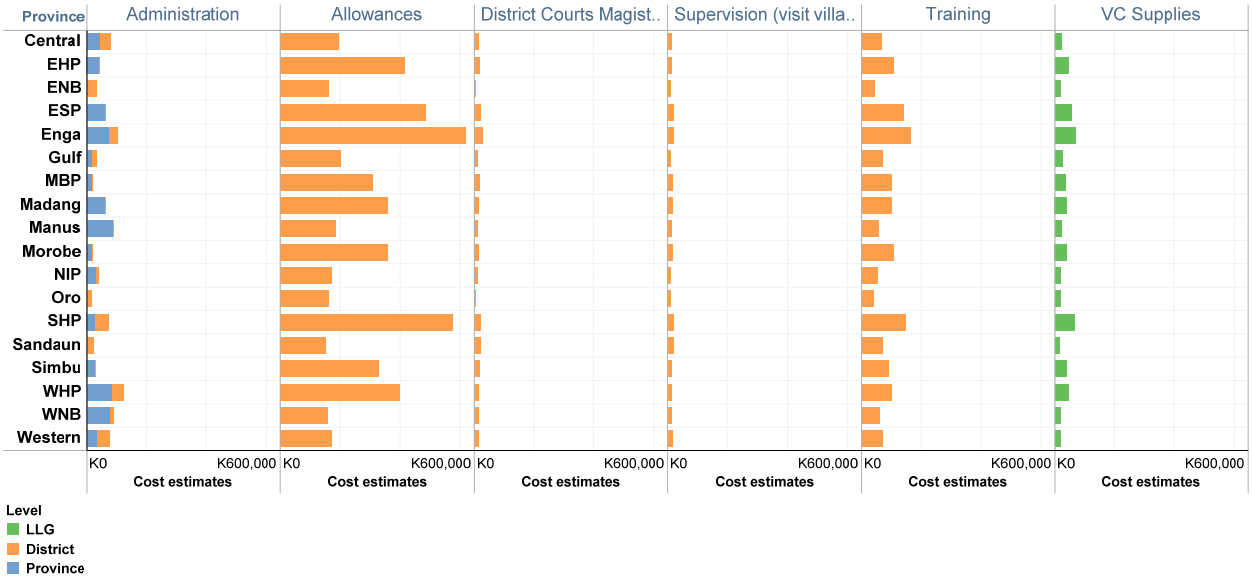


Table 28: Village Court sector unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Peace and Good Order Committee**	Meetings	Prov Meeting	No unique cost
District	**Allowances**	Paying VC officials	Salary	Use official payment rates
District	**District Courts Magistrates support**	Visits to VC		Assume 2 appeals per year per court. One magistrate travels to each VC to hear cases; assume 1 day per court.
District	**Supervision**	Visits to each village court	VC visit	Assume 2 visits from district to each VC, , 0.5 days in each VC for 1 person
District	**Training**	Training of village court officials	LLG training course	Assume 50% of village court official receives 5 day training each year. Assume 2 resource people per course from province level. Assume courses held in each district.
LLG	**Inspection**	Visit to each VC	VC visit	Assume this is part of general LLG quarterly patrol/ visits by LLG staff (see under LLG administration)
LLG	**VC Supplies**	New flags	No of VCs	Assume 10% of VC get new flag each year, unit cost K35 in 2011
LLG	**VC Supplies**	New uniforms & badges	No of VC officials	Assume 20% of VC officials get new uniform and badges each year, unit cost K175 in 2011

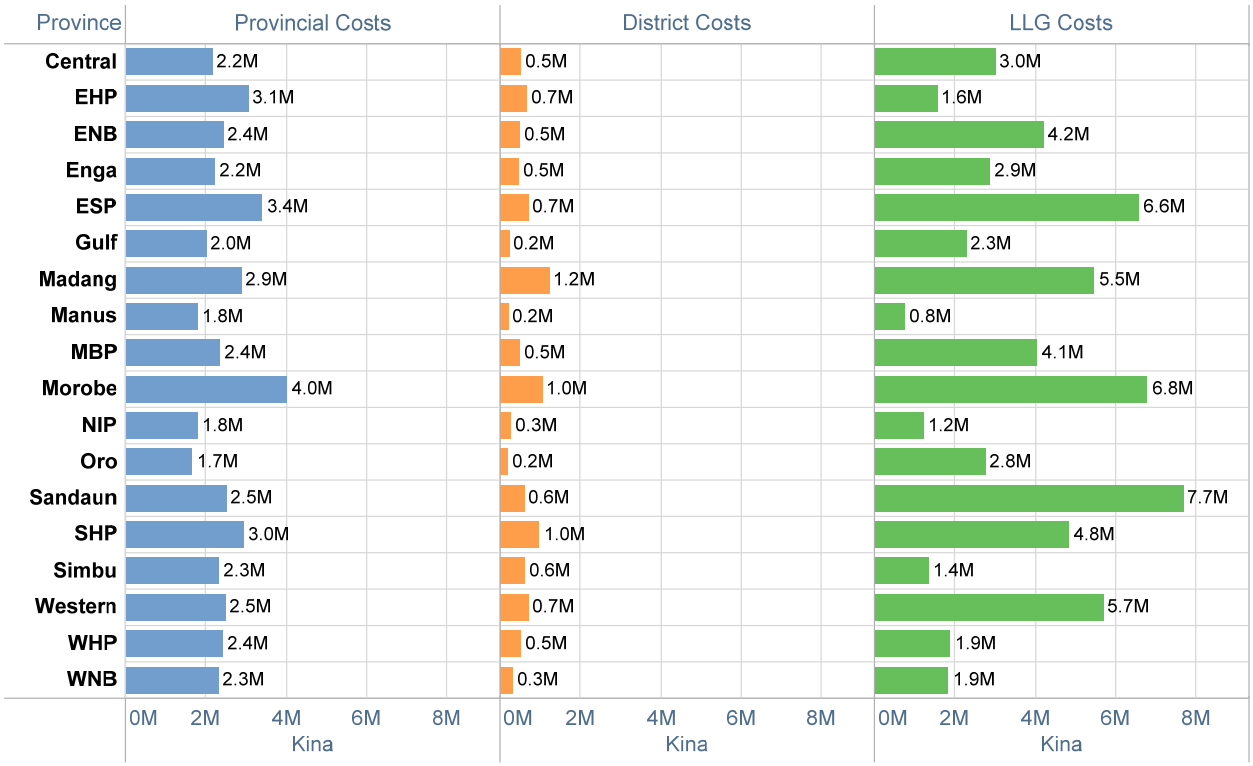
7.3 Administrative Divisions

Overview

- Total administration cost estimate, K120.1 million
- Assembly costs represent 64% (K76.6 million) of administrative costs. The remaining K43.5 million or 36% is spread across the administration divisions.
- The largest proportion of administration division costs are to be found at the LLG level, being 53%. The cost of council meetings, K57.4 million is the single largest contributor.
- Provincial assembly costs also feature highly, at K18.4 million.
- Of the non-assembly costs in the administrative area, the remaining costs are spread across the areas of finance, HR, LLG administration and the Office of the Administrator.

Politics and administrative divisions are a fact of life across government in every country. They play a critical role in a variety of ways and enable and support the political apparatus and service delivery machinery of government at the sub-national levels.

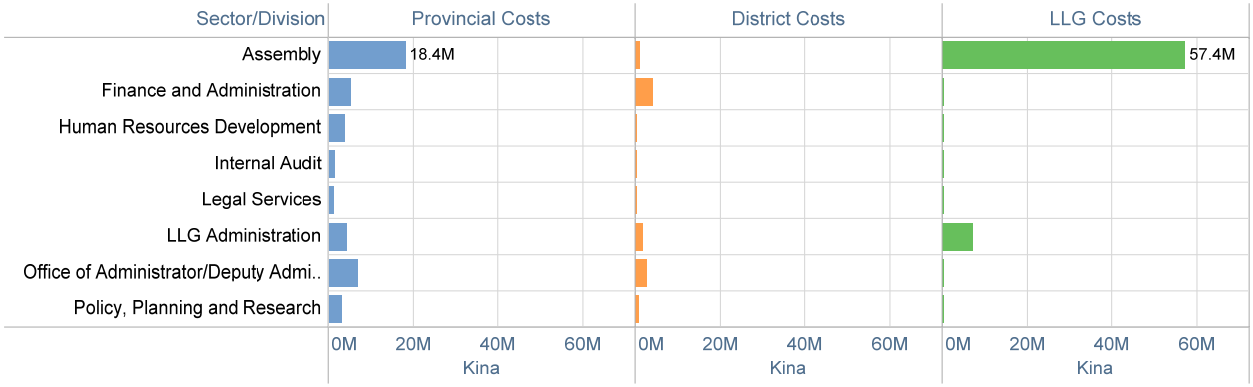
Graph 28: Administrative Division costs by province by level



What factors contribute to the variation in costs we see across provinces?

- The size of the province, specifically the number of LLGs, will directly impact the amount of assembly costs in a province.
- The size of the province together with geographic aspects related to travel will also impact many activity costs. Larger provinces with more administrative outposts, and/or provinces with less accessible terrain, will incur a higher cost of travel to carry out the same functions.
- And finally, larger provinces with more staff in administrative divisions will incur more costs.

Graph 29: Administrative Costs by Division



7.3.1 Offices of Administrator and Deputy Administrator

Summary

- Total cost, K10 million
- Of this K10 million on average two-thirds is administration (overheads) generated by staff supporting the Office of the Administrator.
- Duty travel is K1.2 million being 13% of the overall cost. This reflects the cost necessary to enable the Provincial Administrator and/ or the Deputy to travel for liaison purposes both inside the province (to districts and LLG's) and to Port Moresby is a critical activity that derives costs.

Graph 30: Office of the Administrator – major activity costs by province

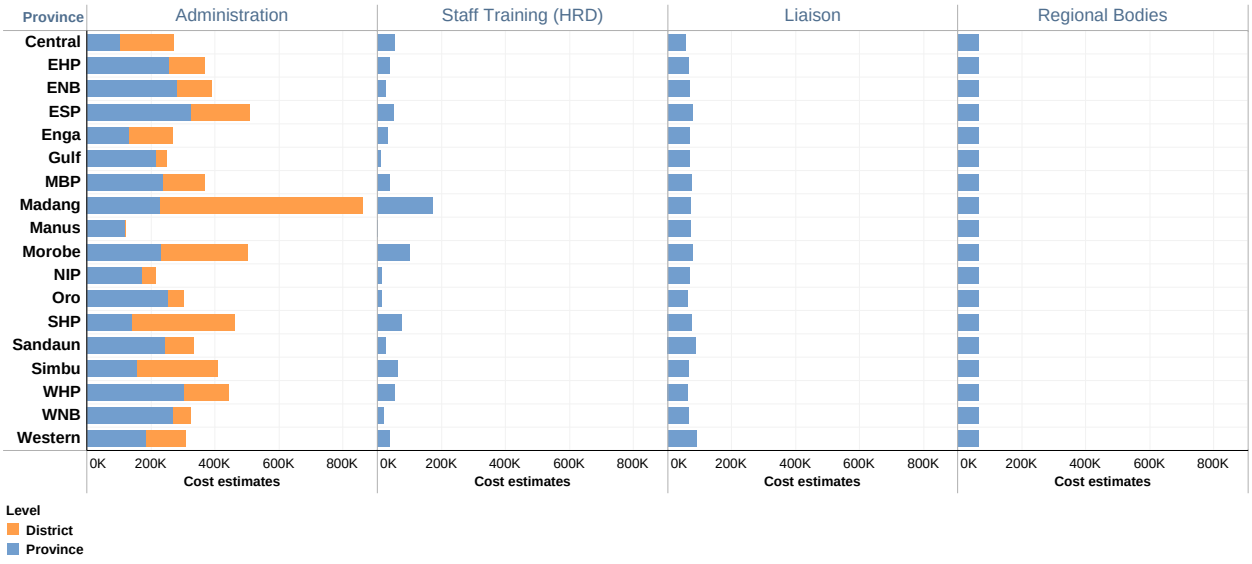


Table 29: Office of the Administrator – unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Liaison**	Travel	POM, District and LLG Travel	Assume 4 trips to POM by 3 staff for 5 days duration, 1 visit to each District for 2 days duration by 2 staff, and 1 visit to each LLG for 1 days duration by 2 staff.
Province	**Regional Bodies**	Funding for Regional body	Grants	Assume K65,000 grant by each province.

7.3.2 Internal Audit

Summary

- Total cost, K1.5 million
- Of this K1.5 million on average just over two-thirds is administration (overheads) generated by staff of the provincial internal audit area.
- Duty travel to perform the provincial audit function is about 18% of the total cost. Duty travel by the internal audit staff is required to perform internal audits of the District Office, LLG's and schools across the province.

Graph 31: Internal Audit – major activity costs by province

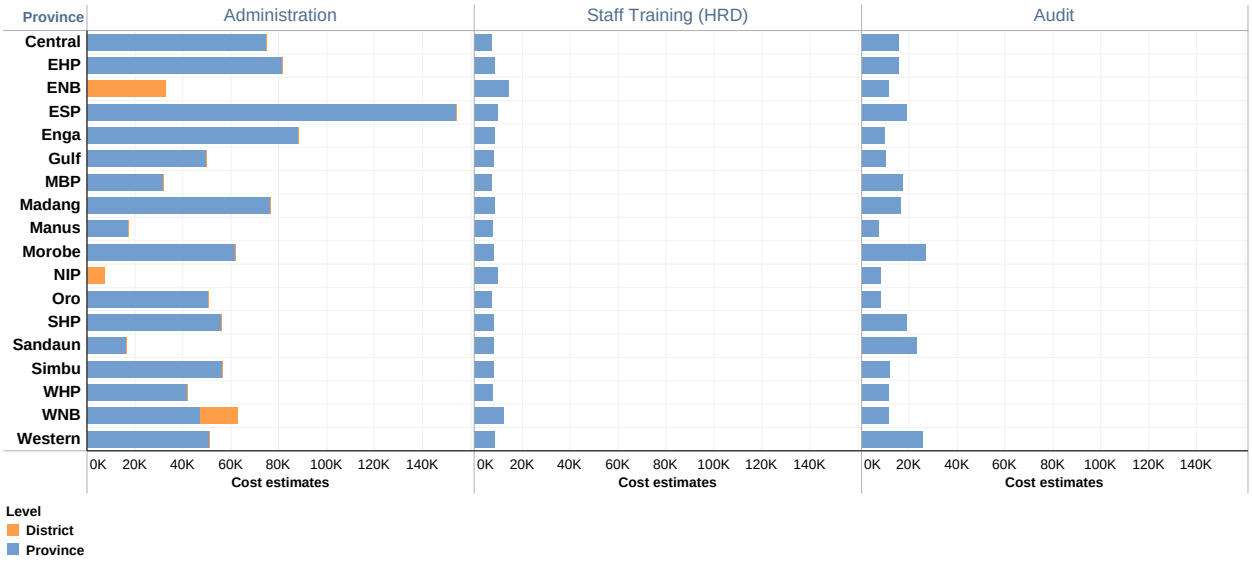


Table 30: Internal Audit – unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Professional association membership**	Professional association membership	Annual fee, number of accountants	Assume prov govt pays for fee of K560 for each accountant
Province	**Human Resource Development**	Continuing education courses	Unit cost	Assumes K1,500 per accountant per annum
Province	**Human Resource Development**	Purchasing professional materials/books	Unit cost	Assumes K200 per accountant per annum
Province	**Audit**	District audit	District visit	Assume 5 days per audit, 1 audit per year each district, 1 staff person. Assume printing of report covered under general administration.
Province	**Audit**	LLG/School audit	LLG/School visits	Assume 50% of LLGs, 10% of community/primary/secondary schools audited each year, 2 days per audit, one auditor per audit. Assume even spread of audits across province. Assume printing of report covered under general administration.

7.3.3 Finance and Administration

Summary

- Total cost, K9.4 million
- Of this K9.4 million on average just over one-third is administration (overheads) generated by staff of the provincial internal audit area.
- Duty travel to perform the provincial audit function is about 18% of the total cost. Duty travel by the internal audit staff is required to perform internal audits of the District Office, LLG's and schools across the province.

Graph 32: Finance and Administration – major activity costs by province

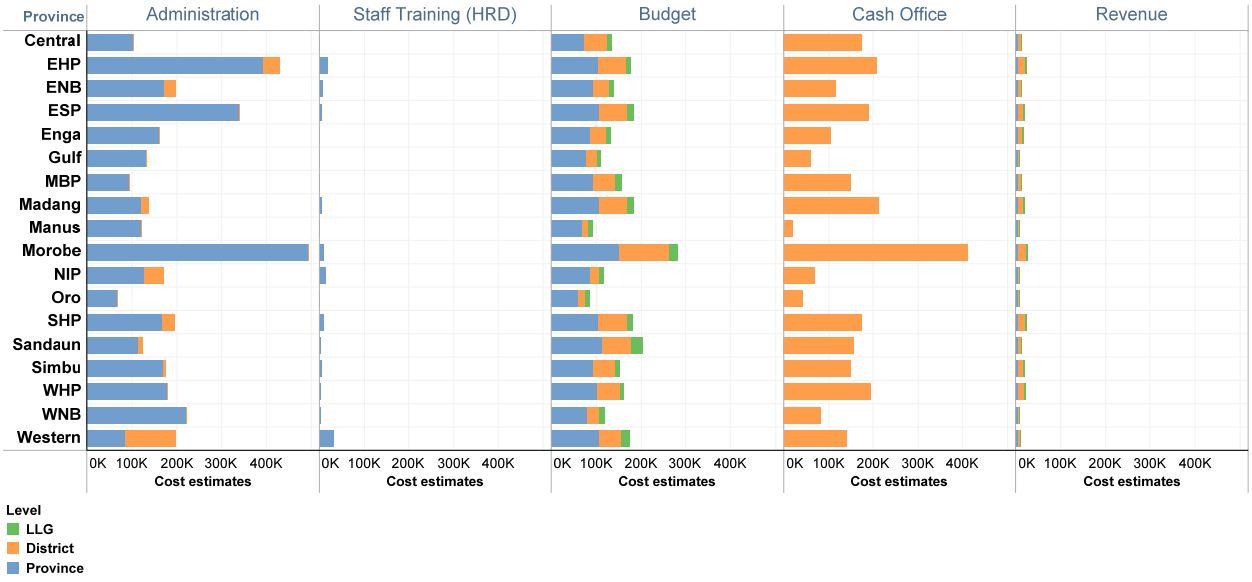


Table 31: Finance and Administration – unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Budget**	Preparation	Province workshop	Assume 1 workshop required per year for 30 pax drawn from province divisions and districts (2 per district); duration of 3 days at prov level
Province	**Budget**	Presentation	POM Visit	Assume two trips are required each year from province to POM. One technical team of 2 people for 2 days to fix/follow-up any problems with budget, and one team of 6 people visiting for 3 days to present the budget. Follow-up visit is assumed to be 1st quarter Budget review meeting.
Province	**Budget**		Printing	Assume 100 copies of 100 pages
Province	**Budget**	Monitoring	Quarterly Reviews (provincial)	District DA and province advisors (30 pax), 1 day meeting 4 times a year at provincial level
Province	**Budget**		Quarterly Reviews (national)	2 people per province travel to POM for 2 days, 3 times a year.
Province	**Budget**	Annual PAC appearance	POM visit	Assume 3 people travel to POM once a year for 2 days
Province	**Revenue**	Revenue Collection (GST, traffic, land tax, liquor)	Local Travel	Assume K5,000 per province for local travel to chase up collections etc. This assumes travel around provincial capital
Province	**Revenue**	Admin	Covered under general admin	
Province	**Central Supply Unit**	Provision of provincial supplies	Covered under general admin - no unique cost	

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Central Supply Unit**	Maintained assets register	Covered under general admin - no unique cost	
District	**Cash Office**	Providing cash to office	Province - LLG travel	Assume one cash offices in each district located in district capital. Assume cash needs to travel from provincial capital to cash offices once a month.
District	**Cash Office**	Security	Province - LLG travel per diem/accomodation cost	Assume two police need to travel with cash each trip - total of three people per trip, 12 times a year.
District	**Cash Office**	Provide acquittals	District travel	Assume one staff from each cash office travel to District every quarter to provide acquittal.
District	**Cash Office**		Stationary	Covered in general admin costs
District	**Budget**	Preparation	District workshop	Assume one workshop per year, 20 people - district and LLG people (assume 2 from each LLG), duration 2 days; held in the district.
District	**Budget**	Presentation	Prov Trip	Assume 3 people from each district travel to province for 2 days once a year
District	**Budget**	Monitoring	Quarterly Reviews (district)	Assume 4 meetings in each district each year, district staff attend and 2 from province for each meeting in each district
District	**Revenue**	Collection/ compliance	Local Travel	Assume lump sum of K2,000 per district for local compliance related travel
LLG	**Budget**	Monitoring	District visit (from LLG)	Assume 2 people from each LLG travel to district for 2 days every 6 months.
LLG	**Revenue**	Collection/ compliance	Local Travel	Assume lump sum of K500 per LLG for compliance/collection related travel

7.3.4 Human Resources

Summary

- Total cost, K4.1 million
- Of this K3.4 million on average 83% is administration (overheads) generated by staff of the provincial internal audit area.
- Duty travel related to travel to district offices for payroll matters is the largest HR activity with a specific cost element attached to it. This activity is estimated to cost K480,000 across all provinces.

Graph 33: Human Resources – major activity costs by province

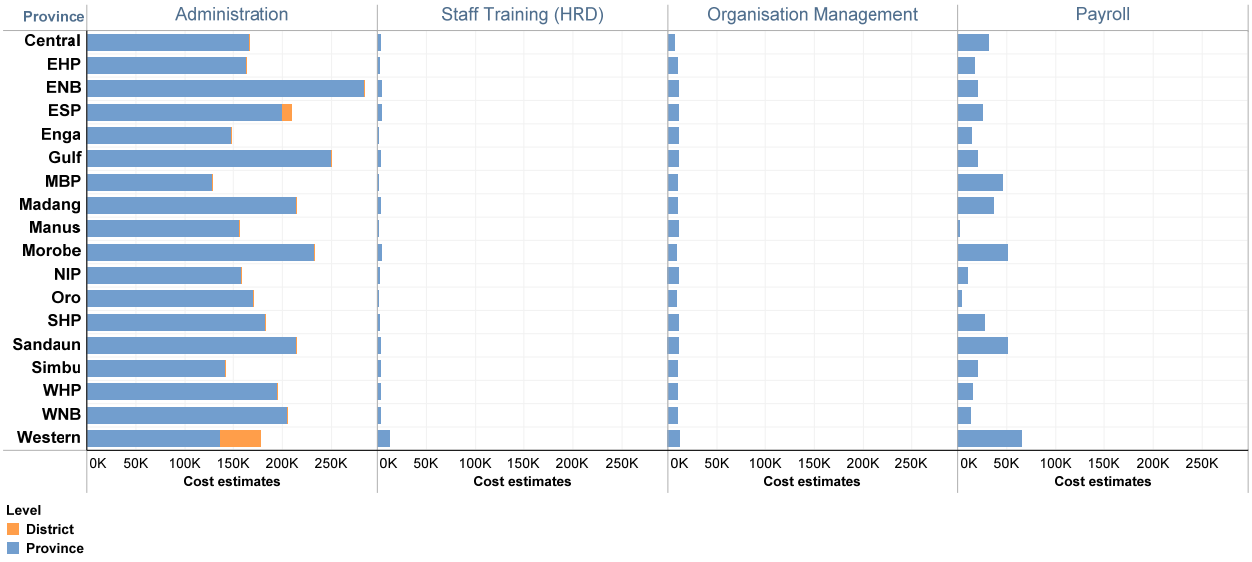


Table 32: Human Resources – unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Training**	Out of province training	Trainin course in POM	Assume 1.5% of public servants receive out of province training per year. Cost of the course is proxied by a 2 week management course provided by IPA
Province	**Training**	In-province training	In province training course	Assume 1.5% of public servants receive in province training per year. Cost of the course is proxied by a 2 week middle managent course provided by IPA in the province
Province	**Training**	HRD Division in-service training	Provincial Training course	Assume 50% of HRD Division staff receive 5 days training per year at provincial level
Province	**Payroll**	Pay roll processing	Freight to POM (fortnightly)	Cost of DHL freight for an A4 package (1kg) from each province to POM each fortnight
Province	**Payroll**		Freight Prov-District (fortnightly)	Cost of trip from province to district with paycheques. Assume 50% of trips are combined with other trips - hence only require 50% of trips to have cost. 1 person travels to each district for one day.
Province	**Organisation management**	Staff restructuring	Travel to POM	Assume 3 people need to travel to POM, once a year for 3 days on staffing issues

7.3.5 Policy, Planning and Research

Summary

- Total cost, K4 million
- Of this K4 million, on average, two-thirds is administration (overheads) generated by staff of the provincial policy, planning and research area.
- The cost of holding workshops for planning coordination and policy dissemination activities are major activity cost areas. Jointly these workshops comprise just under 25% (or K1m) of the total cost.

Graph 34: Policy Planning and Research – major activity costs by province

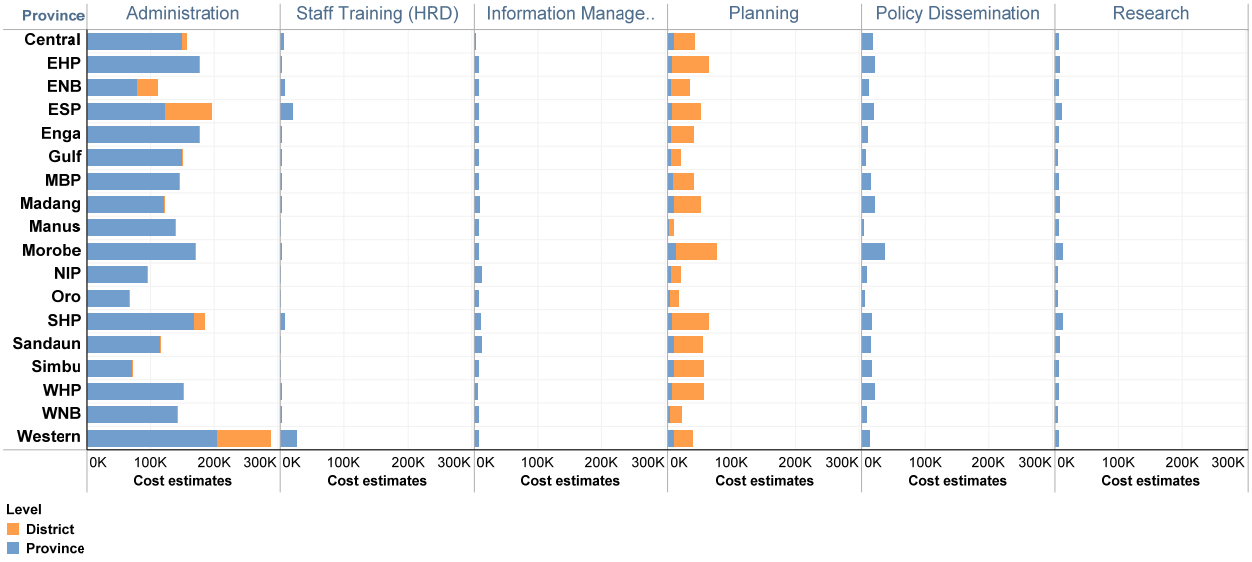


Table 33: Policy Planning and Research – unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Policy Dissemination**	Information sharing	Annual workshop at provincial level	Assume 1 workshop for 30 pax for 2 days drawn from province divisions and districts (2 participatnts from each District)
Province	**Planning**	Development of annual activity plans for Province and District Development Plans	Annual workshop in Province plus one in each district	Annual workshop in Province (15 participants for 5 days) with no participants from Districts, plus one workshop (15 pax for 5 days) in each district where 2 people travel from the Province (and 10 of 15 people from LLGs)
Province	**Information management**	Collection of village survey data for provincial data system	Collection of data from other divisions	No unique cost
Province	**Information management**	Information dissemination	Production of annual report	Assume only discrete cost is printing of 100 copies of report 100 pages long
Province	**Research**	Small scale research/survey work in support of planning	LLG travel	Assume team of 3 people travel to 10% of LLGs for 10 days each year to conduct research/survey

7.3.6 Legal Services

Summary

- Total cost, K1.3 million
- The major cost in this area relates to the prosecution and defence of provincial and LLG court cases.

Graph 35: Legal Services – major activity costs by province

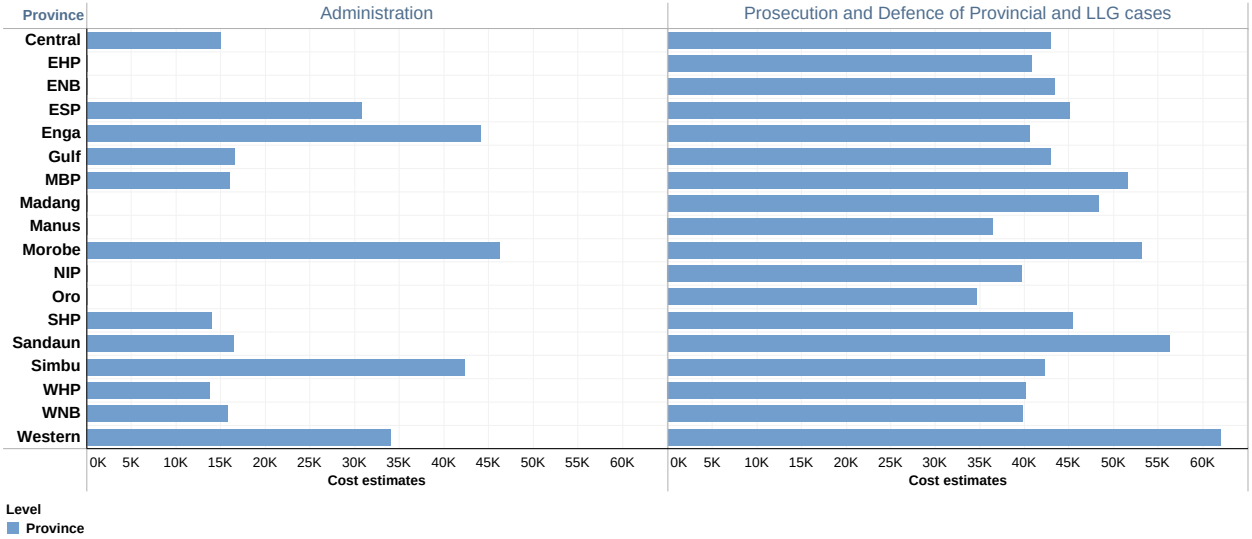


Table 34: Legal Services – unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Human Resource Development**	In-service training for division staff	Province training course	Assume 50% of division staff (from all levels) receive 5 days in-service training per year.
Province	**Human Resource Development**	Compulsory govt lawyers conference	Travel/Fee	Each lawyer attends conference each year. Assume held in POM. Conference lasts for two days plus travel time.
Province	**Human Resource Development**	Continuing legal education courses	Fee	Assume each lawyer does one continuing legal education course per year
Province	**Human Resource Development**	Purchasing legal books	Purchase	Assumes 200 kina per lawyer per year
Province	**Draft Prov/LLG Legisation**	Drafting legislation	Stationary/staff time	Absorbed under admin - no unique costs
Province	**Prosecute/ defend Provincial and LLG cases**	Representation in cases - POM, province, district	POM Travel and District Travel	Assume one lawyer can handle 3 out of province cases per year; 5 National Court cases (in provincial capital) per year; and 10 District Court cases per year. Assume all out of province cases are in POM, and each case requires travel once a year of 5 days to POM for each lawyer. This trip also covers of other in POM work required by the lawyer such as liaison with national legislation bodies etc. Assume national court cases are in provincial capital and require no travel costs. Assume district court cases are evenly spread throughout province and require 0.5 day per case, and are dealt with in clusters of 2 cases per visit.
Province	**Prosecute/ defend Provincial and LLG cases**	Filing Fees (lodgment) with National Court	Fees per court case	Assume 5 national court cases but assume that half of these 3 (rounding up) would be initiated by province hence they would have to pay lodgement fee.
Province	**Prosecute/ defend Provincial and LLG cases**	Company Searches	Fees per court case	Assume half of the out of province and national court cases require a company search.
Province	**Prosecute/ defend Provincial and LLG cases**	Private legal services	Fees	Assume one of the out of province cases requires private legal services to be employed. Assume on average this cost K15,000 per case.
Province	**Prosecute/ defend Provincial and LLG cases**	Subscriptions to national gazette	Annual Subscription	Assumes cost of one subscription to national court judgements , K2,000.
Province	**Professional Accreditation**	Pay fees	Fee	Assumes professional membership fee per lawyer, K2,558.

7.3.7 Assembly

Summary

- Total cost, K76.6 million
- The area of assembly costs is the single largest administrative cost area identified in this study.
- Exactly 75% (or K57.3 million) of the assembly cost total relates to LLG Council Meetings. This comprises the councillor's travel cost to meetings together with their allowances.
- Some 18% (or K14.1 million) relates to Provincial Assembly costs. Some of the major cost items that included in this cost area; provincial assembly member salaries and duty travel costs and committee sitting fees and duty travel costs.
- Note. The 2011 study assumes that the allowances for the Governor are a national responsibility paid by the national level. The 2005 study included these allowances as a provincial cost.

Graph 36: Assembly – major activity costs by province

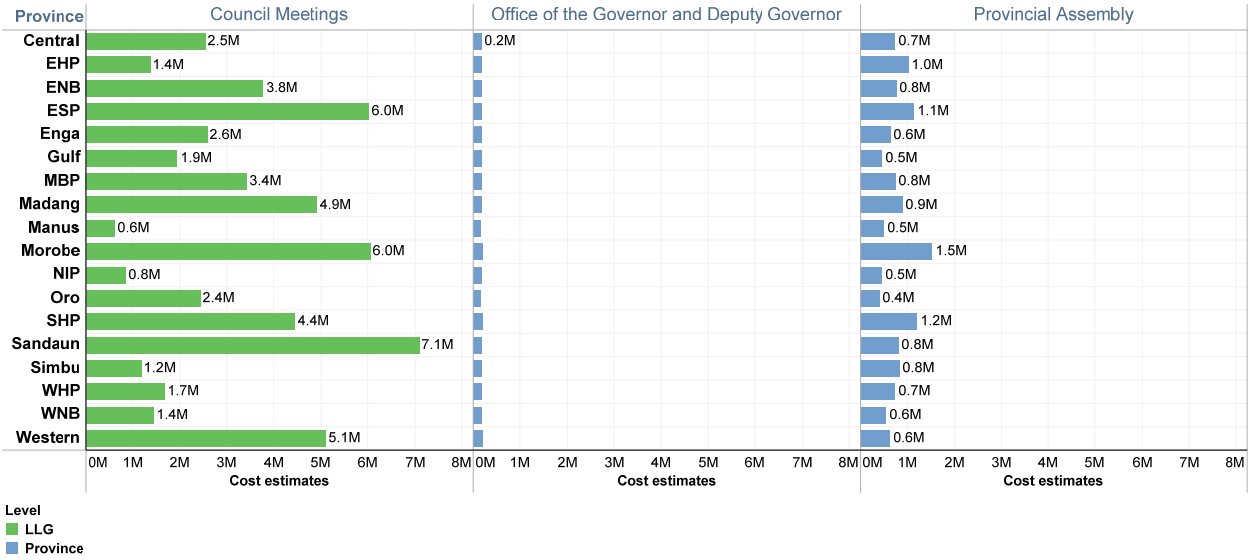


Table 35: Assembly – unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Office of Governor/ Deputy Governor**	Maintain communication	Annual phone cost per person	As per general admin assumptions
Province	**Office of Governor/ Deputy Governor**		Annual post/freight cost per person	
Province	**Office of Governor/ Deputy Governor**	Provide stationary	Annual office supplies cost per staff person	
Province	**Office of Governor/ Deputy Governor**	Maintain office equipment	Annual computer maintenance per computer	
Province	**Office of Governor/ Deputy Governor**		Annual computer consumables per computer	
Province	**Office of Governor/ Deputy Governor**		Annual Photocopy service per photocopier	
Province	**Office of Governor/ Deputy Governor**		Annual photocopy consumables per photocopy	

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Office of Governor/ Deputy Governor**	Provide utilities	Annual electricity cost per staff person	
Province	**Office of Governor/ Deputy Governor**		Annual water cost per staff person	
Province	**Office of Governor/ Deputy Governor**	Vehicle Maintenance	Annual Service/ Repair cost per boat/car	Assume vehicle allowance for deputy governor - as per SRC determination
Province	**Office of Governor/ Deputy Governor**	Housing	Allowance	Assume housing allowance for deputy governor - as per SRC determination
Province	**Office of Governor/ Deputy Governor**	Entertainment	Allowance	Assume entertainment allowance for deputy governor - as per SRC determination
Province	**Office of Governor/ Deputy Governor**	Allowances	SRC mandated allowances	Assume Governor and Deputy Governorwill receive personal allowances and allowances for staff as provided for in the Salaries and Remuneration Commission determination. In addition, it is assumed that termination benefits payable by the provincial government are annualized and included as an amount in each years' budget
Province	**Office of Governor/ Deputy Governor**	Travel	Visits to POM, Districts and LLGs	Assume 5 visits to POM for 5 days (3 people, visit each district 4 times for 3 days
Province	**Provincial Assembly**	Paying SRC mandated allowances	Allowances per assembly member	It is assumed the ordinary assembly members will receive salaries as per the SRC determination. In addition, the provincial government is liable for termination benefits and utility allowances. These are assumed to be annualized and budgeted accordingly.
Province	**Provincial Assembly**	Members accommodation	Per diem per assembly member	As above
Province	**Provincial Assembly**	Member travel	Travel allowance per assembly member	It is assumed that there are 4 assembly meetings each year (a minimum of four are required under the Organic Law) and they last 3 days each. As per SRC determination each assembly member resident outside provincial capital is entitled to receive K100 per sitting day. Ordinary assembly members resident in provincial capital are entitled to receive K50 per day. Members resident outside of provincial capital have their transport paid to attend meetings.
Province	**Provincial Assembly**	Printing	Cost of printing legislation	It is assumed that each Assembly meeting requires photocopying of 50 A4 pages per assembly member for each assembly meeting.
Province	**Provincial Assembly**	Parliamentary Committee	Meeting costs	It is assumed that there are 6 parliamentary committees including the Joint District Planning and Budget Priorities Committee. It is assumed that each committee has a chairman and two members and that the 6 committees meet 4 times per year for an average of 1.5 days. Assembly members receive fees as per the SRC determination.
Province	**Provincial Assembly**	PEC Meetings	Meeting costs	It is assumed as per the Organic Law, the PEC comprises 1/3 of the assembly. It is assumed that PEC meetings are 6 times a year and last for three days. Allowances are payable as per the SRC determination. It is assumed that transport allowance would be payable to all PEC members resident outside provincial capital. It is assumed that one PEC member and the Governor reside in the provincial capital, and other PEC members are spread evenly between the nearest and farthest LLG.
District	**JDPBPC**	Meetings and LLG Member travel	Meeting costs	Assumes 4 meetings per year of 2 days duration. assume that Open member and appointed members live in District centre, and LLG Presidents travel. Assume 2 LLG members per vehicle to attend meetings.
LLG	**Council Members**	Paying SRC mandated allowances	Allowances per councilor	As per mandated allowances, assumes 5 meetings of 2 days duration per annum.
LLG	**Council Members**	Members accommodation	Per diem per councilor	Camping allowance
LLG	**Council Members**	Transport	Travel allowance per councilor	As per mandated allowances. Assumes half of total LLG-clinic point travel time to reach LLG.
LLG	**Council Running Costs**	Rations	Cost per meeting	As per standard assumption for LLG meetings. Refreshments are 2 cans of soft drink, 1 wopa biscuit, 1 can Ox & Palm Red 340g, 300g rice, 1 can besta tuna, plus tea and sugar.
LLG	**Council Running Costs**	Stationary	Cost of official documents	Assumes standard cost of meeting supplies
LLG	**Council Running Costs**	Printing	Cost of printing legislation	Cost of printing 1,000 pages of legislation per annum at the provincial centre.

7.3.8 LLG Administration

Summary

- Total cost, K13.2 million
- The major activity cost is supervision where
- 34% relates to staff; being K2 million on overheads for LLG staff plus K2.5 million on training.

Graph 37: LLG Administration – major activity costs by province

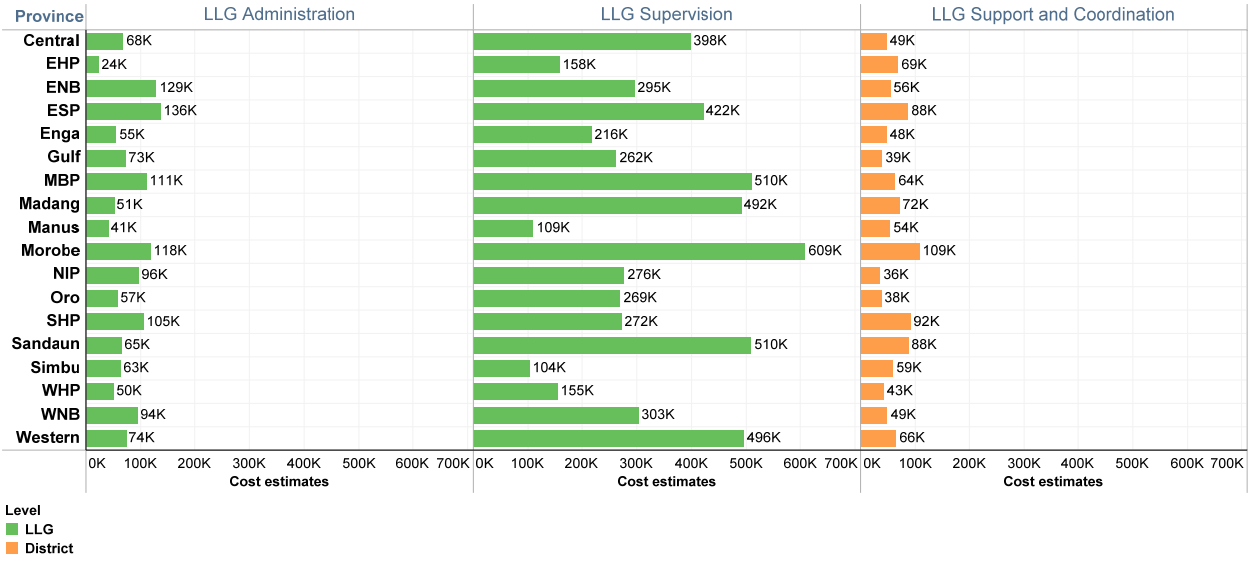


Table 36: LLG Administration – unique activity inputs and assumptions

Level	Function/ Program	Activity	Input Unit	Costing Assumptions
Province	**Policy Coordination**	District support/ supervision of LLG staff	District Visit	Travel from Prov to Distrrict for 1 staff 4 times a year, for 2 days.
Province	**Disaster Coordination**	Emergency response	Visits to LLGs	Assume 1 visit from Prov to 10% of LLGs for 3 people for 5 days each year
District	**LLG Support and Coordination**	Supervisory visits to each LLG	District - LLG travel	Quarterly visit to each LLG for 3 days (2 staff)
LLG	**LLG Administration**	Maintain communication	Annual radio maintenance	As per general admin cost assumptions
LLG	**LLG Administration**	Provide stationary	Annual office supplies cost per staff person	
LLG	**LLG Administration**	Vehicle Maintenance	Annual Service/ Repair cost per boat/car	Assume each LLG has one vehicle - car if land based, boat if sea based.
LLG	**LLG Administration**	Building/ Furniture Maintenance	Annual repair of LLG HQ	As per general building maintenance assumptions
LLG	**LLG Administration**		Cleaning	Annual cleaning cost per staff person
LLG	**Ward Supervision**	Supervision of ward committees, project management, aid posts, schools, DPI offices, village courts	Ward supervisory visit	1 visit per quarter for 2 staff to each extension point in LLG (route depends on each LLG). Duration = 1 day of work plus travel time.

8. Appendix 1: Definitions of Costing Terms Used

Term[49]	Definition
Asset Procurement	Refers to the purchase of an asset. Example: the replacement of a motor vehicle.
Basket of Local Costs	Refers to an activity where the underlying cost is based on a set of goods priced locally (i.e. the price is specific to either the province or the district) Example: the procurement of elementary school supplies is based on a standard set of supplies cost at local prices.
Local Costs	Refers to an activity where the underlying cost is based on local prices (i.e. the price is specific to either the province or the district) Example: the procurement of elementary school supplies is based on a standard set of supplies cost at local prices.
National Responsibility	Refers to an activity that is deemed to be a national responsibility.[50] No cost is estimated in the study for these activities. Example: postal charges to send grades 8, 10 and 12 school examination papers from Port Moresby to the province are deemed to be a national responsibility.
National Standard Costs	Refers to an activity where the underlying cost is based on a cost allocation or price that applies nationally to all provinces/districts.[51] Example: The maintenance of unsealed roads has a uniform cost per kilometre of road which applies to all provinces.
No Unique Costs	Refers to an activity that is deemed to incur no additional costs. In these instances any cost related to the activity is deemed to have already been estimated (and absorbed) in another activity. Example: the submission to the Provincial Education Board to establish a new school. This activity is assumed to happen at a regular meeting.
Travel Calculation	Refers to an activity where the underlying cost is based on the costing models travel calculation methodology. Example: the collection of exam papers from schools is based on a travel calculation.
Unit Cost	Refers to the cost to undertake one unit of a particular activity. Example: The maintenance of roads has a uniform cost per kilometre which is an example of a 'unit cost'.

[49] Some cost estimates may involve a combination of factors. In-service training, for instance, involves both a travel calculation for participants and the use of local costs based on the local price of supplies.

[50] Activities that are deemed to be National Responsibilities may still be noted in the study to maintain the completeness of the activity set and to ensure that awareness is maintained of all activities critical to the Governments' administrative and service delivery machinery.

[51] The term 'allocation' in this context is different to a 'price'. An allocation is a ballpark estimate whilst a price is an amount confirmed by a survey. For example, an amount estimated as a community grant is likely to be a ballpark estimate – what we call an 'allocation', whilst the cost of a photocopier is a 'price' confirmed by a survey.

9. Appendix 2: A Cautionary Note on this Cost Study

The cautionary note that follows was drafted in 2007 – all Kina amounts are as at that time. The Kina amounts and some of the assumptions will have changed since that time however the warning that this study is minimalistic and *'bare bones'* still stands.

It may be tempting to assume that by funding provincial governments up to the level of the NEFC cost estimates, they should be adequately resourced to meet all their expenditure mandates. That assumption would be incorrect.

The costing study was prepared for the purpose of establishing relativities between provinces in terms of the cost of their expenditure mandates, as a basis for dividing up a limited pool of funding. Thus it was less important to be accurate about the total quantum that it was to be accurate about the differences between the cost of the same service being delivered in different districts and provinces.

At the time the costing study methodology was designed, Papua New Guinea was experiencing some budgetary stress. It seemed highly unlikely that provincial funding would come even close to the total cost of expenditure mandates in the foreseeable future. Since both funding and actual expenditure had fallen so grossly short of any reasonable levels, it was decided that a conservative approach represented the most appropriate first step in establishing new benchmarks for both funding and expenditure.

A primary objective in designing the methodology was to be extremely conservative in the estimates, so that every single element of the costs could be readily justified. We wanted to be certain that we could confidently assert that any reduction in funding below the level of these estimates would certainly result in a reduction in service levels. We were less concerned with being able to confidently assert that this level of funding would certainly be sufficient for the services to be delivered in full. It was always anticipated that the study would provide a basis to build on in terms of understanding what might be appropriate funding levels, rather than the final answer.

Each activity cost is built up from input costs which are extremely conservatively estimated. As an example, the operating budget for a single health centre or rural hospital is comprised of: the following input items:

- 200 litres of kerosene per year
- 18 litres of bleach
- 120 cakes of soap
- 1 mop
- 1 bucket
- 10 x 13kg gas bottles (to power vaccine refrigerator)
- 1% of capital cost as a building maintenance allowance (based on a construction cost estimates of a standard health centre building design provided by Department of Works).

It was assumed that all rural health centres and hospitals operate without electricity, mains water or telephones. There was no allowance for ancillary staff (e.g. cleaners). It is assumed that patients provide all bedding and food, and medical equipment and drugs are provided by the National Government.

It would be dangerous to assume that this level of funding would actually be adequate to operate a health centre in accordance with Papua New Guinea standards, particularly the larger rural hospitals which have 20 or 30 inpatient beds and operating theatres.

Some indication of how significantly the NEFC costing study may have underestimated costs can be gained from looking at the current funding levels for church-run health centres and rural hospitals. On the basis of the NEFC costing, the operating costs of running church health facilities in Papua New Guinea is less than K5 million. The actual funding currently being provided to church health agencies to meet their operating costs (not including the separate salary grant) is K13 million. There is no anecdotal evidence to suggest that church health services are flush with money. Indeed, the opposite is the case. All the evidence is that they do a good job with relatively little resources.

In other words, the actual cost of church health facility operations may well be K13 million, not K5 million. If this is the case, it suggests that the NEFC cost estimates may have underestimated actual costs by as much as 60%.

There are some particular areas where substantial costs of service delivery were not included in the study:

1) **No capital costs:** No capital costs were incorporated into the costing other than for vehicles, boats and computer equipment. Replacement costs for these assets were allocated over an assumed asset life substantially longer than is usually used.

   Provincial governments do have substantial capital cost responsibilities, in particular in relation to roads.

2) **Road rehabilitation and emergency maintenance costs:** Provincial governments are responsible for between 55% and 65% of the nation's road network. The national Transport Development Plan assumes that the cost of rehabilitating degraded provincial roads is a provincial cost responsibility. A rough estimate of the total capital cost for all provinces is between K7 to K14 billion.

   No allowance was made for any capital, rehabilitation or emergency maintenance costs of provincial roads or bridges in the costing study. Only the regular, routine costs of maintenance were included in the costing. The assumed cost was around K10,000 per km per year for a gravel road and K7,000 per km for a sealed road.

3) **No wage costs:** No casual wage costs were included in the costing study. It was assumed that all necessary staff would be paid as public servants. In some provinces it is possible that there are significant numbers of health workers on the casual payroll. If they were to be no longer employed, this may result in the closure of health facilities. More information is needed before any assessment can be made about whether some essential casual wage costs should in some cases be added into the costing estimates.

4) **Patient transfers:** Cost estimates for the cost of emergency patient transfers were initially developed on the basis of statistics provided by the Department of Health as to the number of patients requiring emergency transfer from rural areas to provincial hospitals. The first cost estimate for this single expenditure item was over K120 million.

Since this cost represented just one element of the health budget, it was felt that such a large number had the potential to distort budgetary decisions by provinces (i.e. that it would justify them spending most of their budget on patient transfers, which the Department advised as already over-prioritised in comparison with preventive expenditures such as adequately funding health centres – which might lessen the need for transfers for far less per capita expenditure). The cost estimates were reduced to around K20 million. Nevertheless, it is recognised that patient transfer expenses are demand-driven and can be very expensive. In determining the cost, it was assumed that transfers were always made by the cheapest possible route. No allowance was made for emergency helicopter flights, for example.

5) **School operating costs:** School operational funding is complicated in PNG because it is funded from four different sources. There has been a general assumption that provincial governments will contribute a total of around K20 million. The national government contributes around K35 million and the remaining costs are met by parents and school fund-raising, or are simply not met.

   NEFC did not have the resources to undertake any realistic cost estimate of school operating costs. It was therefore assumed that the existing level of funding for school operations is adequate. It is almost certain that this assumption is not correct. It is hoped that this area of the cost estimates can be revised in future using some of the information collected through the NDoE unit costing study.

6) **Curriculum materials:** Under the national Curriculum Materials Policy, Provincial Governments are responsible for replacing curriculum materials in schools. It is estimated the total stock of school books needs to be replaced every 3-5 years. There was no information readily available on what this might cost, so NEFC simply omitted this cost from the calculation of the total education cost.

   We justified not including this cost on the basis that, in the interests of efficient service delivery, this function should be resumed by the national government. In the meantime it is likely that donors will fill the gap. However, we are aware that at least three Provincial Governments spent large amounts of funding (in one case almost all their education funding) on this cost in recent years.

7) **Urban services—water supply and sewerage; urban road maintenance:** A handful of Provincial Governments in Papua New Guinea are responsible for providing urban services such as water supply and sewerage. We know that they cannot provide these services on a cost recovery basis, because the PNG Waterboard makes a loss in all areas of its operations except its largest district of Lae, revenue from which is used to cross-subsidise its other operations. No cost estimates for these services were included in the costing study because they are asymmetric responsibilities (i.e. only undertaken by some provincial government). Road maintenance responsibilities in some of the larger provincial capitals also fall to provincial governments because they are beyond the capacity of local governments.

10. Appendix 3: Cost Estimates