VANUATU MILLENNIUM CHALLENGE ACCOUNT

Data Quality Audit – Second Mission

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Revised 22 October 2010 on receipt of comments from MCA-V

July 2009 (revised December 2009)

Acknowledgements

I would like to thank the Director of the MCA-Vanuatu and his staff for the co-operation, support and guidance during my mission to Port Vila, which made my stay fruitful and pleasurable. I would also like to thank the National Statistical Office, under the leadership of the Acting Government Statistician for their patience in responding to my many questions and requests for further information.

I would also like to thank the MCA Economist for supporting the mission in spite of several challenges.

This is a revised version of the report, which responds to comments received some 10 months after the original report. This was caused by delays in some of the data producers responding and by the change of personnel in the MCA-V office. The comments received by me on 8th July 2010 are most helpful and I thank the authors for taking the time and trouble to respond.

Executive summary

Quality Audit Mission 2

A. Recommendations on context

1. The second mission of the Data Quality Auditor took place between 10th and 24th July 2009. The M & E Plan has changed considerably since the last mission, and in addition the auditor was asked to comment on the timescale for the future data collection activities, and the contribution the monitoring data may be able to make to the evaluation of the project which is due to take place towards the end of 2010.

2. The report is organised according to the indicators and studies contained in the Monitoring and Evaluation Plan. This report will focus largely on the goal indicators, as these are the indicators for which data has recently been collected, and for which baseline data is derived. The report then examines the objective and outcome indicators, and looks at capacity building components of the programme. Finally the final evaluation is discussed briefly.

3. There are three goal indicators for the project, increased cash income, poverty rates and increased tourism employment. It should be noted that all three indicators are difficult to measure accurately, and that change in the poverty rate is likely to occur rather slowly among the proposed project beneficiaries. As the MCA programme has so far not completed any of it projects it is rather unlikely that the goal indicators will show significant movement prior to the end of this compact. In the limited time left for the project to meet its goals it is unlikely that a change in the indicators will be distinguished from the sampling and non-sampling errors in the data. The next HIES will not be conducted until 2011[1], it should not be conducted sooner for a number of reasons. Firstly the HIES will take some time to prepare and could not be easily completed by the time of the evaluation. Secondly the national population census will start later this year leaving the VNSO with no capacity, and lastly there will be little advantage to conducting it earlier as few of the goal indicators will have shown significant movement.

4. To fill this monitoring gap, several additional intermediate indicators have been proposed which are likely to be available before the final evaluation of the programme, these relate closely to the goals will be required, and have the following advantages:

- They relate directly to the road projects and have fewer problems of attribution than the current goal indicators.
- They are practical, cost-effective and relatively easy to collect
- Baseline data already exists, as these studies are included in the M & E plan
- The indicators are likely to react more quickly to the projects on completion, than the current indicators which are expected to move slowly over time and which have large measurement errors.
- Measurement error is smaller – with suitable supervision and quality control.

[1] In fact the HIES will now take place in 2010 (information received July 2010)

B. Recommendations on the cash income per capita indicator

Of particular concern was the appearance in the M & E Plan of higher estimates for Santo than for Efate. Incomes are expected to be higher in Efate. The auditor recalculated the mean cash incomes of the two islands, using new data files provided by NSO. The results are somewhat different for the results which appear in the M & E Plan (Table 2.6), and have been converted to dollars using the Alevy rate of Vt.106 to the US$.

Validity and Reliability:

1. The catchment area referred to should be clearly defined, to enable the data to be accessible and transparent to users. It is therefore proposed that the data for all of the island regions or Sanma and Shefa be included in the catchment. This will enable users to compare the M & E results with official statistics from elsewhere in government and will lead to sustainable monitoring systems consistent with Government's own regions.
2. Comparing the results in the M & E Plan with the HIES data, the baseline value printed appears far too high. The baseline values in the M & E Plan should be amended using cash expenditure rather than cash income, to eliminate extreme values and problems associated with the highly seasonal nature of cash income.
3. The mean per capita (unadjusted for adult equivalents) household cash expenditure data from the HIES should be used. The cash expenditures will be measured in year 1 and year 5 using the 2011 HIES.
4. Several recommendations relate to the conduct of the HIES in 2011. These include the following:
    - Longer training of supervisors and enumerators, with particular emphasis on the importance of the diary component and its full and accurate completion.
    - Elimination of non-vital areas of questioning to reduce respondent burden. This might include deleting any questions on the person questionnaire relating to health and education which have not been used subsequently. If the data has been used then it would be worth keeping the questions, but it is important to focus the attention of the enumerators on the key poverty questions. Too long a questionnaire tends to result in poorly completed consumption data and a trade off has to be made by the questionnaire designers.
    - More frequent visits to encourage households to complete the diary including the possible appointment of a diary assistant.
    - Taking care to remove large cash purchases from the diary and to include these in the list of purchases in the household questionnaire (section 6). An analysis of major cash purchases found in diaries should be undertaken in order to amend the list of major purchases in the 2011 HIES.
    - Conduct of a panel survey in 2011 would be desirable to reduce the impact of using two sets of independent sampling errors when comparing change between the two surveys., Respondents are sensitive to confidentiality issues and the re-appearance of enumerators at households may cause loss of trust in the confidentiality of the data. Any decision to use a panel approach should be accompanied by better publicity about the survey and

about how confidentiality is maintained. The consultant is aware that the additional administrative burden on the VNSO may not make this most desirable option feasible.

- Full metadata on the data cleaning, imputation and aggregation used to compile the cash income and expenditure variables should be compiled and made available as metadata. This will improve interpretability and help ensure that the same methodology is followed in 2011.

- The 2011 survey should be conducted during the same months as the 2006 survey to avoid distortions due to seasonality which will be particularly important in the rural areas, and potentially in the urban areas where tourism is seasonal.

Precision and reporting requirements:

5. The precision of the estimates is unlikely to be sufficient to distinguish error from real change. The estimated increase in cash incomes of 25% seems high, and if lower will reduce the likelihood of measuring real change.

6. In any case, the results of the HIES 2011 will be after the final evaluation of the MCA programme. No obvious alternative data source is available. A proxy might be the increase in the number of road users taking goods to market from the Origin and Destination Survey, or an increase in the number of small enterprises operating along the roads from the Roadside Enterprise Survey which is discussed later in the report.

Timeliness:

7. The results relating to income and poverty have not been made available on a timely basis, but this is because the NSO did not have the capacity or knowledge to undertake this highly complex work. The NSO had not previously calculated poverty or household income and required a considerable amount of time and support from international experts to complete the work.

8. Future surveys to collect this information will be collected after the end of the compact it is therefore not going to be possible to assess the impact of the project on poverty and income before the final evaluation. To ensure that future data is completed in a timely manner full metadata should be completed by the NSO.

9. The survey was completed before the project commenced and was well timed for a baseline study.

Integrity:

10. There is no integrity problem connected with the income or poverty estimates. The data have been carefully checked by a number of international experts, and no signs of interference with the data have been noted. The data were collected according to international norms, and under the provisions of the national statistical law.

C. Recommendations on the poverty indicator

Validity and Reliability:

1. It will be preferable to use the official poverty data for a number of reasons:

- The metadata used by NSO – although complex and difficult to follow - is available from NSO. It should be fully documented and made available to users.

- NSO now has the capability, with support, to produce poverty estimates in future years using the ADB methodology and will be able to replicate the process on the 2011 HIES.

- The poverty estimation methodology is consistent with that used by other Pacific countries, and commonly used in the developing world. This supports comparability and consistency with internationally accepted practices.

- The Paris Declaration, subscribed to by the donor community, advises donors to support country systems wherever possible in the interests of reducing transaction costs and supporting countries' own capacities.

- The official estimates are likely to be used by other partners and the international community and it would be advantageous for the MCC to utilise the same data and statistics as others.

2. The NSO and the ADB consultant calculate the poverty headcount and rate for Shefa and Sanma using the same methodology as was used for the official report, this is the VNSO/ADB method. To save time and costs the poverty rates could be recalculated simultaneously with the 2010/11 rates.

3. Exactly the same method of calculating poverty should be used for the 2011 HIES; therefore the methodology used should be clearly documented in a manner which will enable the same process to be followed in 2011 by other consultants and staff in the NSO.

4. Poverty estimates are extremely susceptible to small changes in method and the institutional knowledge can be easily lost if the processes are not well documented. poverty specialist should be recruited in 2011 to estimate and compare the changes in poverty using a common methodology; he or she should also estimate the sampling error around the estimates. It is recommended that an expert who is skilled in developing country poverty estimation is recruited.

5. As recommended in my first report, much better collection of local prices is needed at the time of data collection. As is the calibration (weight or volume) of non-standard units such as baskets of produce. Prices and weights are needed to standardise nationally, the value per unit of the home grown commodities consumed by households.

6. Other recommendations are identical those described for indicator 1, which uses the same data source. These recommendations relate to longer training for enumerators, better field supervision and the treatment of major purchases in the daily diaries completed by household to record consumption

Precision and reporting arrangements

7. To reduce sampling error, a panel survey approach is recommended in 2011. This will mean re-interviewing the same households as were approached in 2006, and having a sound procedure for replacing households that have moved or cannot be found. If a panel survey is carried out then good publicity will be required to explain how confidentiality is preserved and kept secret to the NSO staff alone.

8. As described above, there will be no new poverty estimate until 2011. It would be unwise to bring forward the date of the next survey, as this would clash with the population census activities, and would be unlikely to yield useful results. It would be helpful to develop some poverty proxies using the 2006 HIES for more rapid poverty estimation; however this may be beyond the scope of the current MCA programme. Alternative indicators from the roadside enterprise survey are proposed later in the report.
9. Poverty rates change extremely slowly, even in countries which have had large amounts of aid and infrastructure improvement. For example poverty in Rwanda fell by just 3% during the 5 year period covered by the last Poverty Profile, despite improvements to all its major roads, 'At the national level the proportion of the population identified as poor fell from 60% in 2000–01 to 57% in 2005–06 '. This is not atypical; therefore the expected reduction of between 6% and 7% in the compact period which is due to end in 2010 may be optimistic, particularly as no road is yet complete. The poverty estimates are very sensitive to methodological changes and price assumptions it may therefore be difficult to attribute any change in poverty rates to the programme, or to distinguish change from error. Confidence intervals for the poverty rates of Sanma and Shefa should be calculated.

Timeliness and integrity

10. The same data source is used for income and poverty; therefore the comments are identical to those given in section C (paras. 7-10) above

D. Recommendations on the number of tourism jobs created indicator

1. This is the most problematic of the three goal indicators, as the methodology used was not robust and will be difficult to replicate. The data auditor is proposing using a different data source and changing the consultants' terms of reference for the enterprise survey in 2010.

2. The definitions are so far inadequately defined, for example what exactly is a tourist job? Many occupations which serve tourists also serve the local population – examples of this are bank staff, retail shop workers and bus drivers,

3. The data source was intended to be the Tourism Survey Baseline Study which was conducted in 2007/08. The consultant had a number of data quality issues relating to the survey and doubts whether reliable employment estimates could have been obtained from such a study.

4. The consultant estimates overstate tourism employment, in comparison with the HIES results. While not all employment in the selected industries can be attributed to tourism, and not all of that to the MCA programme, the estimates from the HIES have the advantage that they:

    - Can be estimated using the HIES, and corroborated using the population census or other regular household survey.
    - They are sustainable and likely to be collected by the NSO on a regular basis.
    - The definition of a tourist job is clear and unambiguous.
    - Family workers are included who are likely to be found in many smaller enterprises in the rural areas of Efate and Santo.

Precision and reporting:

5. A major revision should be made to the baseline numbers of workers (paid employees, self-employed and unpaid family workers) in service industries in Santo and Efate using the results from the HIES. The methodology is clearly defined and the result is consistent with the published official estimates, and the metadata is available to stakeholders. The result is capable of being replicated using the 2010/11 HIES. It can also be checked in the 2009 Population Census.
6. Abandon the business survey carried out by the consultants and replace this with a hotels survey or a business survey in collaboration with NSO, based on the sound scientific selection principles more usually employed by official statistical agencies in collecting data from enterprises. While the business survey may contain useful information for estimating tourism income, this information will be subject to the same biases and lack of precision as the employment estimation data. The NSO should consider an alternative means of estimating the contribution of tourism to GDP estimates.
7. The results of the roadside enterprise survey should also be added as a more direct measure of roadside enterprise and employment generation. An additional indicator should be included on the number of enterprises and employees situated on the Efate ring road and East Coast Santo Road. This is discussed below.

Timeliness

8. The timeliness of the data was good, and the timing of the surveys would be adequate if the remaining quality issues were adequate. The data were available after 3 months, and the final data after 9 months. There could have been more speedy resolutions of the issues between the draft and the final reports.

Integrity

9. Some stakeholders spoken to had concerns about validity of the estimates. The auditor was unable to check the database, and is therefore unable to comment further on the accuracy of these concerns. Trust in statistics is a valid quality concern and some steps should be taken in future to ensure that key users are fully confident that scientific methods were used. The names of the sampled and responding enterprises were kept confidential to the consultants, and the response rates were low. Any future survey should be conducted in collaboration with the VNSO and under the auspices of the statistics law to enable the company names to be released to the statistical authorities. I was unable to access the raw data during my mission due to the travel schedules of the auditor and of survey consultant's personnel.

E. Recommendation on three groups of additional intermediate indicators proposed

1. The final evaluation will take place at the end of 2010, and a simpler set of more easily measured intermediate indicators is recommended for this, based on the tourism surveys conducted by the consultants and using the surveys which have been managed and implemented by the MCA. Three additional indicators are proposed.

2. Interesting results emerge from the roadside survey, which give a clue to roadside businesses in the country, which are of a different type to urban enterprises. Around one half of those working in roadside enterprises were family members rather than employees (this point should be noted in relation to the tourist employment information collected by the tourism enterprise survey which excluded this category of employment or assumed that the term employees would cover all workers). 17% of enterprises had been operating for a year or less and a further 42% for 2 to 5 years. The mean age of enterprises was 7 years in both islands.

3. **The roadside enterprise survey** (discussed above) includes 100% coverage of enterprises directly in the catchment of the road programmes and any increase in their numbers or workers could be more directly attributable to the Compact. The indicators proposed would be:

   The number of enterprises and the numbers of persons employed in enterprises situated on the Efate Ring Road.

   The number of enterprises and the numbers of persons employed in enterprises situated on the East Coast Santo Road.

   - The baseline figure for Efate is 247 businesses and 248 persons employed. In Santo the enterprise survey showed 113 enterprises and 145 people employed.

4. The methodology for the roadside enterprise survey should be written up in a report that will allow the survey to be replicated in 2010. The original instructions have been lost following the loss of the MCA computer hard disk.

5. One potential impact of better roads is the increase in the **number of international visitors visiting destinations in Efate and Santo**. These results can be extracted from the survey of 2007, which is due to be repeated in 2010. These would provide useful information for the forthcoming evaluation.

6. Information can be obtained from the Air Departures Survey Q11 & Q12 and from the Cruise Passenger Survey Q8a. The baseline results are extracted from the report published by TRIP.

   Percentage of international air visitors travelling to other parts of Efate:

   Baseline 2007: 59%

   Definition: Proportion of visitors arriving by air who visit areas of Efate beyond Port Vila.

   Percentage of Efate cruise visitors travelling to other parts of Efate:

   Baseline 2007: 37%

   Definition: Proportion of visitors arriving in Vila by cruise ship who visit areas of Efate beyond Port Vila.

   Percentage of international air visitors travelling to Santo:

   Baseline 2007: 10%

   Definition: Proportion of visitors arriving by air who visit Santo during their visit.

7. **Tourist spending** is of considerable importance to the Vanuatu economy – according to the consultants it may comprise up to 20% of GDP. It would be helpful if this indicator could be included in the list of MCA indicators. The 2004 Visitor Survey report publishes a total visitor expenditure of Vatu 7.865 billion[2], This only covers visitors arriving by air and is therefore comparable with the Vatu 9.735 billion expenditure estimated from international air tourists in 2007. Tourism has risen by 32% and expenditure by 24%.

   Total expenditure by international visitors by air:

   Baseline 2007: Vatu 9.7 billion

[2] Page 11, 2004 Visitor Survey Report, NSO, Port Vila

Definition: Estimated total expenditure of air visitors to Vanuatu.

8. An alternative might be per capita expenditure which would be Vt. 119,675, it should be noted that per capita spending has fallen since 2004 according to the tourism surveys.

F. Recommendations on the objective and outcome indicators

1. Four objective and outcome indicators have been set for the two sub-projects. These will be addressed in turn. Number of new hotel rooms constructed. This indicator has proved to be difficult to collect in Port Vila. The MCA economist has pursued a number of officials to try to determine a reliable source, but the authorities of Port Vila have no formal mechanism operating to authorise the completion of new hotel rooms, and do not keep a comprehensive list of hotels with room numbers. The other authorities of Shefa Provincial Government, Sanma Provincial Government, VTO, NTDO and VIPA do collect information, but given the importance of the contribution of Port Vila hotels, the value of this information is limited.

2. The MCA Economist is to keep in contact with Vila authorities to pursue a better data source. Until then, this indicator should be abandoned due to insufficient quality because of the lack of cooperation of hoteliers with the government.

3. As an alternative it is recommended that the TRIP consultants divert their contract resources away from the Business Survey to a specific hotels census or to supporting a NSO managed enterprise survey. The consultants are said to have good relationships with many of the tour operators in Vanuatu and may be more successful than the NSO in getting the hoteliers to cooperate with surveys.

4. The proposed TRIP consultant hotel census should cover all hotels in Efate and those in Luganville and in the catchment of the Santo East Coast Road. The informal and formal sector survey should provide a register for this census, but additional research will be required to establish if any new hotels have been added or have been closed since that survey.

5. The Number of International Tourists (arrivals) per annum is an unproblematic indicator being based on an official series of long duration and credibility; however the figure in the M & E Plan is different from the official estimate. The baseline number should be revised to conform to the official published data, unless there is a good reason to depart from this, in which case the reasons should be clearly footnoted.

6. The MCA may wish to review the target in the M & E Plan as this has already been exceeded. Meeting this target is clearly not the result of the M & E Programme, as no road has yet been completed.

7. Traffic volume (total daily average number of vehicle on the road). The Auditor was able to assist the MCA Economist to process the data collected from the traffic survey. Vehicles can pass several traffic counter points, therefore they may be an element of double counting, however the estimate should be sufficiently robust for the purposes of the monitoring as long as it is clearly defined.

8. The M & E Plan should clearly indicate that the indicator refers to the sum of the average number of vehicles passing over selected checkpoints on the road concerned.

9. The Origin Destination Survey seems a very valuable way of tracking the use of the road over time, and indicating who the major beneficiaries are of the road. The users of the two roads are currently very different and should prove helpful to those evaluating the MCA programme.

10. The enumerators should be fully trained and supervised during the survey. Written instructions are needed for the interviewers, and better quality control and editing of the data is needed to eliminate erroneous dates from the dataset. Several dates were found which were outside the survey period and this makes the estimation process difficult.

11. Where possible, the interviews should coincide with the traffic counters activity; this will ensure that the weighting procedures relate the interviews to the physical counts of data. Account should be taken of the presence of cruise ships in the islands. It is understood that a cruise ship was in Vila at the time of the previous survey in Efate. This may have an impact on the survey results.

12. The MCA economist will require additional support and equipment to undertake the data collection to the quality standards require, to relieve him of some of the pressure.

13. Number of days the road is closed. These data are collected from PWD – due to illness and time constraints this indicator was not reviewed. The MCA Economist reported no problems with this straightforward indicator.

14. Share of road length in 'fair condition'. The exact calibration of this indicator was discussed at length and piloted in Efate in the first visit of the Data Quality Auditor (2007). Since this first visit, the same exercise was carried out on the Santo East Coast Road. This was carried out in 2008 after the road had benefitted from routine maintenance prior to its handover to the contractors responsible for construction. The proportion of road in fair condition was estimated to be 94% - a score which does not represent the true baseline condition of the road. There is little to be done retrospectively to redress this situation. The exercise should be repeated at the end of the MCA programme.

15. Annual PWD Score .The scheme for scoring PWD performance was devised on the first data quality mission. The first assessment took place in 2008 and achieved a score of 14 points. There are several quality assurance issues, but it is the view of the evaluator that the quality constraints are more likely to lead to unrealistically low scores rather than high scores.

16. At the operational level low scores were partly achieved due to very late disbursement of funds to the Public Works Department (PWD). Other reasons are the lack of a computerised system which records progress quantitatively and poor culture of form filling among PWD staff in the outer islands.

17. The AusAid computer system being introduced should be designed to meet the MCA reporting requirements. There should be further training in form-filling for all those involved in reporting on progress of road maintenance, and the ways in which maintenance of road sections are measured and reported should be standardised.

18. The timeliness of the MCA conducted surveys has been good with the surveys conducted on time, processing has taken longer largely because the MCA is not equipped with the software to undertake survey processing.

19. The integrity of the MCA conducted surveys is good, as the consultant checked the records of the origin and destination surveys and found no problems. However some oversight from the NSO may be preferable to ensure that the MCA is not open to any allegations of adjusting the figures to suit its own purposes. The roadside surveys are likely to contribute most of the evidence for the evaluation of the project, as they are available, attributable and of reasonable quality.

G. Support to NSO and MDG monitoring

1. The MCA programme has made a contribution to the statistical capacity in Vanuatu. Not only is this information important to the MCC, but it will also allow other development partners to monitor their programmes in respect of poverty, and will also provide information for statistical users in the country.

2. The HIES has allowed the NSO to report on the incidence of poverty in Vanuatu – this has allowed Vanuatu to produce for the first time data on Goal 1 Eradicate extreme poverty and hunger.

3. Consumption expenditure and cash incomes. This information has enabled NSO to modernise two key economic series. The CPI was last rebased in 1983 the HIES data has enabled a new rebased CPI to be produced.

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List of tables and figures

Abbreviations

ADB	Asian Development Bank
EA	Enumeration area
HIES	Household Income and Expenditure Survey
OPM	Oxford Policy Management
MCA	Millennium Challenge Account
MCC	Millennium Challenge Corporation
MDG	Millennium Development Goals
M & E	Monitoring and Evaluation
NSO	National Statistics Office
PWD	Public Works Department
PPS	Probability Proportional to Size
SPC	South Pacific Commission
UNDP	United Nations Development Programme
USD	United States Dollar
VNSO	Vanuatu National Statistics Office

1 Data Auditing for MCA-Vanuatu

1.1 Background

In January 2004 the United States Congress passed a new compact for global development to be managed by the Millennium Challenge Corporation. The Government of Vanuatu was an early beneficiary of this initiative and is receiving assistance to facilitate poverty reduction through economic growth in Vanuatu. MCA-Vanuatu is established as an independent unit within the Ministry of Finance and Economic Management to be the legal entity responsible for the oversight and management of the implementation of the Compact.

The project has developed an ambitious Monitoring and Evaluation Plan as part of the project implementation. The project has already contributed funding towards the collection of baseline information, and has included the services of a consultant data quality auditor. The main objective of this consultancy is to ensure that data collected for program monitoring and evaluation is of acceptable quality, reliability, and consistency.

1.2 Changes in the MCA project since the first visit

Since the first visit of the consultant several issue have arisen which have changed the scope and nature of the monitoring and evaluation component. The major change has been the reduction in the number of sub-projects from 11 in number to 2. The two projects which will go ahead, and are already in progress are the two road projects on the islands of Efate and Santo.

The full terms of reference for the consultant are reproduced in Annex A; these have not changed since the revisions to the project. The consultant is to review the data gathered, to ensure that data reported are valid, reliable, timely, and precise as resources allow. This is to verify the quality and consistency of data across different implementing entities and reporting institutions. The data quality reviews will also assist in identifying key issues or problematic areas regarding data quality and identifying mitigation measures to correct the problems. The Consultant shall review the following but not limited to;

- the methodology in which the data are collected;
- the accuracy of analysis to determine computed indicators;
- the methodology in computerizing of indicators;
- the flow of data from the various institutions to MCA-Vanuatu;
- the accuracy, consistency, and reliability of primary and secondary data;
- the review the print format and interface of the data in the database; and
- review methodology and accuracy of reporting to both MCA-Vanuatu by implementing institutions and reporting from MCA-Vanuatu to MCC.

1.3 MCC Quality Criteria

The MCC has recently introduced a data quality policy, the “MCC Policy on Monitoring and Evaluation of Compact and Threshold Programs”. This has much in common with other international data quality standards, particularly the IMF’s DQAF.

MCA-Vanuatu and the data quality reviewer are asked to ensure that M&E data used to measure indicators meet the following standards:

1) **Validity:** Data are valid to the extent that they clearly, directly and adequately represent the result that was intended to be measured. Measurement errors, unrepresentative sampling and simple transcription errors may adversely affect data validity. Data should be periodically tested to ensure that no error creates significant bias.

2) **Reliability:** Data should reflect stable and consistent data collection processes and analysis methods over time. Project managers should be confident that progress toward performance targets reflects real changes rather than variations in data collection methods. Reliability can be affected by questionable validity as well as by changes in data collection processes.

3) **Timeliness:** Data should be available with enough frequency and should be sufficiently current to inform management decision-making. Effective management decisions depend upon regular collection of up-to-date performance information.

4) **Precision:** Data should be sufficiently accurate to present a fair picture of performance and enable project managers to make confident decisions. The expected change being measured should be greater than the margin of error. Measurement error results primarily from weakness in design of a data collection instrument, inadequate controls for bias in responses or reporting; or inadequately trained or supervised enumerators.

5) **Integrity:** Data that are collected, analyzed and reported should have a mechanism in place to reduce the possibility that data are subject to erroneous or intentional alteration.

The data quality checklists are appended to this report, as requested. In addition the data quality reviewer has paid particular attention to replicability and appropriateness of scale of the monitoring demands made on the government and the MCA staff, as this small island nation has limited capacity. The MCA is making a very welcome substantial contribution to building statistical capacity in this small nation, and those indicators which have a wider use beyond the project are of particular value and comments will be made on this issue throughout the report.

1.4 Data Auditing Plan

Three missions to Vanuatu are planned over the life of the project, the plan for data auditing were as follows. These were amended as follows following the project changes during the mission of 2009.

1.4.1 Mission 1

This was carried out in November 2007 and the initial quality review was made of the proposed indicators. Since that report several changes have been made to the M & E Plan and the HIES data has been used to create a poverty line, and poverty headcounts for Vanuatu after some further cleaning and imputations of missing records.

The NSO is to be congratulated on developing the first poverty statistics for Vanuatu, and making further use of the HIES (2006) to rebase and improve the CPI and National Accounts. This will have wide implications for monitoring and policy making among all partners and within the government.. The MCA project has made a very positive contribution to the advancement of official statistics in Vanuatu, about which more will be said later in the report.

1.4.2 Mission 2 (2009)

The second mission took place between 10th and 24th July 2009. The original report intended that the auditor:

- Follow-up on recommendations made during mission 1
- Check poverty estimation methodology and comment
- Review results of tourism survey – compare tourist business survey with any results from NSO's Business Survey (Business survey not yet done – planned for 2010)
- Review results of agricultural survey – make recommendations on using this methodology in next HIES (not now thought to be useful)
- Examine data collected for all newly collected indicators – from PWD, wharf managers, Air Vanuatu etc. (These indicators have largely been retired).
- Re-examine road condition survey – (progress after 2 years).
- Make further recommendations on next HIES for inclusion in survey
- Comment on feasibility of M & E process when in operation and the adequacy of resources to undertake it – suggest efficiency measures.
- Report her findings to stakeholders (limited due to illness among MCA staff – but debriefed Economist and NSO).

The M & E Plan has changed considerably since the last mission, and in addition the auditor was asked to comment on the timescale for the future data collection activities, and the contribution the monitoring data may be able to make to the evaluation of the project which is due to take place towards the end of 2010.

It should be noted that the ill health and influenza affected members of the MCA team and the auditor during the visit. In addition the computer of the MCA economist suffered a catastrophic failure which meant that some of the data needed could not be recovered. In the event the auditor was able to cover the terms of reference and some of the addition requests made of her by the local MCC representative.

Some guideline were received from the MCC at the end of the mission, these have been incorporated in the report wherever possible.

1.4.3 Mission 3

The initial mission recommended the following steps: these will be amended in the recommendations to this report.

- Follow-up on recommendations of mission 2.
- Review results of all surveys (HIES and Tourism) – and quality of comparisons. How robust are the findings. (it is now understood that the HIES will not be conducted until 20111 which is beyond the contract period therefore the findings of the Tourism, Traffic and Enterprise surveys will be reviewed)

- Ensure all data is properly recorded and archived.
- Comment on M & E Process

1.5 Structure of the report

The report is organised according to the indicators and studies contained in the Monitoring and Evaluation Plan. This report will focus largely on the goal indicators, as these are the indicators for which data has recently been collected, and for which baseline data is derived.

In addition several additional intermediate indicators have been proposed which are likely to be available before the final evaluation of the programme. As the HIES will not be conducted until 2011 some intermediate indicators which relate to the goals will be required. These intermediate indicators have the following advantages:

- They relate directly to the road projects and have fewer problems of attribution than the current goal indicators.
- They are practical, cost-effective and relatively easy to collect
- Baseline data already exists, as these studies are included in the M & E plan
- The indicators are likely to react more quickly to the projects on completion, than the current indicators which are expected to move slowly over time and which have large measurement errors.
- Measurement error is smaller – with suitable supervision and quality control.

The report then examines the objective and outcome indicators, and looks at capacity building components of the programme. Finally the final evaluation is discussed briefly.

From the list of indicators in the original project a number have survived, the original list and the deletions are shown in Table 1.1 below. The new indicators and their baseline data will be discussed below.

Table 1.1 Revised MCA-Vanuatu Indicators

Indicator No.	Description	Data Source
1	Increase cash income per capita of beneficiaries	HIES
2	Reduce poverty	HIES
3	Increase tourism employment	Tourist enterprise survey
4	Number of new hotel rooms	VTO/Councils
5	Number of tourists per annum	NSO & tourism surveys
~~6~~	~~Number of hotel rooms occupied (bed-nights)~~	~~NSO~~
~~7~~	~~Air freight uplifted from Malekula~~	~~Air Vanuatu~~
~~8~~	~~Cargo shipped from Loltong Wharf~~	~~TBD~~
9	Average annual daily traffic volume	MCA/PWD
~~10~~	~~Days road is closed~~	~~PWD~~
~~11~~	~~Number of S.W. Bay flights cancelled~~	~~Air Vanuatu~~
~~12~~	~~Time at wharf~~	~~TBD~~
~~13~~	~~Warehouse damaged cargo and revenue~~	~~TBD~~
14	Share of roads in good or fair condition	MCA
15	Roads upgraded	MCA
~~16~~	~~River crossing constructed~~	~~MCA~~
~~17~~	~~Airstrips upgraded~~	~~MCA~~
~~18~~	~~Maritime wharves reconstructed~~	~~MCA~~
19	Annual PWD Score	PWD/MCA

2 Compact Goal Indicators

2.1 Summary on goal indicators

Reduce Poverty by Increasing Economic Activity and the Incomes of Men and Women in Rural Areas through the amelioration of transport infrastructure

There are three goal indicators for the project, increased cash income, poverty rates and increased tourism employment. It should be noted that all three indicators are difficult to measure accurately, and that change in the poverty rate is likely to occur rather slowly among the proposed project beneficiaries. As the MCA programme has so far not completed any of it projects it is rather unlikely that the goal indicators will show significant movement prior to the end of this compact. In the limited time left for the project to meet its goals it is unlikely that a change in the indicators will be distinguished from the sampling and non-sampling errors in the data. For this reason the auditor recommends some additional intermediate or outcome indicators, which may present proxies for the impacts that the MCA is hoping to monitor at the goal level with these indicators. These are more likely to monitor changes within the life of the project, and to contribute to the final evaluation of this MCA project. It should be noted that the next HIES will not be conducted before the final evaluation takes place, therefore none of the current high level goals will be able to be measured in the evaluation. The last goal indicator (tourist related employment) was intended to be measured by the series of tourism surveys planned in 2010, but the quality of this data is assessed as very unreliable and other data sources are recommended in preference.

The three high level indicators should continue to be measured – in the longer run it is hoped that they will yield useful results for the country; for monitoring support from other development partners; and for the MCC in any future support to Vanuatu or longer run evaluation of the programme.

2.2 Goal Indicator 1: Increase cash income per capita of beneficiaries

The source for this indicator is the 2006 Household Income and Expenditure Survey (HIES) carried out by the National Statistics Office, with financial support from the MCA.

2.2.1 Cash income per capita of the population living in the project catchment area (Efate Round island road and East Coast road, Espiritu Santo)

- **Definition:** The variable in question is not currently well defined. In respect of the catchment or the unit of measurement.
- **The catchment** should be all persons living in the islands of Santo and Efate, as to use a smaller catchment invites problems about defining beneficiaries, and then calculating estimates from potentially small sample sizes. The improved roads are likely to benefit all residents of the two islands, although the benefits in Santo will be unevenly spread. A question remains to be answered about whether the offshore islands should be included, the likely answer to this is yes, as it may cause the VNSO problems in isolating the main islands from their offshore satellites.
- It is assumed that the measure is the *mean* annual per capita **cash income** expressed in US dollars. Therefore the definition of income would be the annualised per capita monthly cash income (monthly cash income *12) of

households in the catchment area. To create the cash income statistic, the total cash income in each household must be divided by the persons (not using equivalence scales) resident in each household to give a household per capita income[3]. The indicator is expressed as US dollars – in the Alevy document from which the estimates were drawn, the exchange rate was 106.48 vatu per dollar to enable the results to be expressed in dollars. Care should be taken on future exchange rate parities when comparing the variable over time.

Commentary on the definition of Cash Income: There are risks in using mean cash income, as the results are easily disturbed by extreme values, for example if a large cash income sum was received by one of the sample households during the reference period, then this would affect the mean value. If income is measured over a short period of time the results will tend to over or under-estimate the annual or monthly income because of its sporadic and irregular nature, wrongly allocating households to rich and poor categories. This is particularly the case in subsistence economies like Vanuatu. Asking for income over the long reference period leads to large reporting errors as respondents are not able to recall their income over such a long period. Expenditure on the other hand tends to represent a more steady and regular stream of consumption, as households smooth out the peaks and troughs of their incomes[4]

'The empirical literature on the relationship between income and consumption has established, for both rich and poor countries, that consumption is not closely tied to short-term fluctuations in income, and that consumption is smoother and less-variable than income…. As a result, in circumstances where income fluctuates a great deal from year to year-as in rural agriculture-the ranking of households by income will usually be much less stable than the ranking by consumption, though exceptions can occur as discussed in Chaudhuri and Ravallion (1994). Even limited smoothing gives consumption a practical advantage over income in the measurement of living standards because observing consumption over a relatively short period, even a week or two, will tell us a great deal more about annual-or even longer period-living standards than will a similar observation on income[5]'

This weakness is exacerbated by collection of some forms of cash income in the weekly diaries completed by households.

- In some instances (see mission report 1) a single item of cash income is weighted up as a regular income to give an annual total (for example a one-off large gift in a diary then multiplied by 30/14*12, although I understand that these were 'treated' following the first audit report) or seasonal sales from crop sales recorded over a 30 day period were then multiplied by 12 to give an annual monthly total, this kind of inappropriately annualised income leads to extreme values. It is not possible to distinguish regular from seasonal or ad hoc incomes, except in the case of regular wages and salaries which are uncommon outside the two urban areas. (see Table 2.1 for annualisation procedures).

- Income estimates often relate to a 12 month period, and are very susceptible to recall errors, as farmers and small informal businesses often have no clear idea of

[4] See Angus Deaton and Salman Zaidi; Guidelines for Constructing Consumption Aggregates for Welfare Analysis' LSMS Working Paper 135, World Bank, Washington, 2002 pp 11-13

[5] ibid

earnings and profit, because their income is earned erratically. Wages and salaries are just 35% of all income in Vanuatu[6], although in the two urban areas wages and salaries are much more important (75%). Income is therefore likely to be of reasonably good quality in urban areas, but poor in the rural catchment areas of the project. VNSO does not use the income data for the reasons stated above, and uses the mean cash expenditure in its place

Table 2.1 Annual estimates of cash income in HIES: potential sources

	Cash Income	Annualisation	VNSO use[7]
Wages	30 days	x 12	used
Sales Crops	30 days	x 12	used
Business	12 months	1	used
Other jobs	12 months	1	used
Odd jobs	12 months	1	used
Welfare benefits	12 months	1	used
Other income	12 months	1	not used
Cash gifts	7 days (2 diaries)	30/14*12	not used
Winnings	7 days (2 diaries)	30/14*12	not used

One alternative is to use expenditure data, which tends to show a smoother distribution of outgoings over a year, with households retaining seasonal income for expenditure over future months. The list of what constitutes a major purchase is clearly set out in the household questionnaire in section 6. This list might be reviewed in the design of the HIES 2 to ensure that any major purchases found in diaries in HIES 1 are on the list of major items, to ensure a good fit of what a common major purchase is in Vanuatu; for example few rural households will be purchasing large items of furniture and for them shoes or uniforms for children may be major items. Any large purchases should be recorded over a 12 month period, to avoid distortions from 'grossing-up' expenditures made over a 2-weekly period to an annual estimate. If they do occur, then part of the editing procedures should be to remove them from the diary and treat them as an annual purchase. This approach is recommended by the VNSO and the MCA-V indicators and definitions might be amended to take account of this.

[6] Source HIES Report Figure 2-1 page 26

[7] Based on VNSO comments received in May 2010

Table 2.2 Annual estimates of expenditure in HIES

	Cash Expenditure	Annualisation
Rent	Respondent determined, actual or imputed rent	
Mortgage	Excluded and treated as savings	
Insurance	Respondent determined	
Building home (not normally regarded as consumption expenditure)	12 months	1
Home maintenance	12 months	1
Major purchases	12 months	1
Utilities	1 month	12
Licences	12 months	1
Hire charges	12 months	1
Vehicle purchase	12 months	1
Vehicle repairs	12 months	1
Travel international	12 months	1
School & health	12 months	1
Cash Purchases	2 weeks	30/14*12

Response to the problems of using cash income: There are several alternatives which could be chosen from the survey to give a value less susceptible to extreme values.

- Median cash income, this avoids distortion from extreme values but does not avoid seasonal issues.
- Trimmed mean income – the extreme 5% of values are ignored (does not avoid seasonal problems).
- Per capita cash expenditure – a smoother proxy for income avoiding cash sales of seasonal crops of unusual cash winning or gifts.

The results for the overall mean, median and expenditure options are described in the tables below. The cash income and expenditure estimates for Shefa are reasonably similar; however in rural areas and Sanma the cash income described is well above the estimated cash expenditure (see tables Table 2.4 and Table 2.3), perhaps illustrating the problem of seasonal cash incomes from agricultural sales being inappropriately annualised. Rural households receive very irregular amounts of cash, as a result of seasonality and sales of seasonal harvest produce. Figure 2.1 demonstrates a particularly big gap between cash incomes and cash purchases in Sanma.

2.2.2 Means and medians

The graphs below illustrate the difference in using mean or median as the statistic. In the case of income the median can be a better measure, as a few people tend to have large incomes and many people have smaller ones. In other words income is not normally distributed. The graphs below illustrate this gap which is particularly true of Shefa – where there is high equality; and also shows the lower values of the median as a statistic.

Figure 2.1 Comparison of cash income and cash purchases – Sanma and Shefa urban & rural[8]

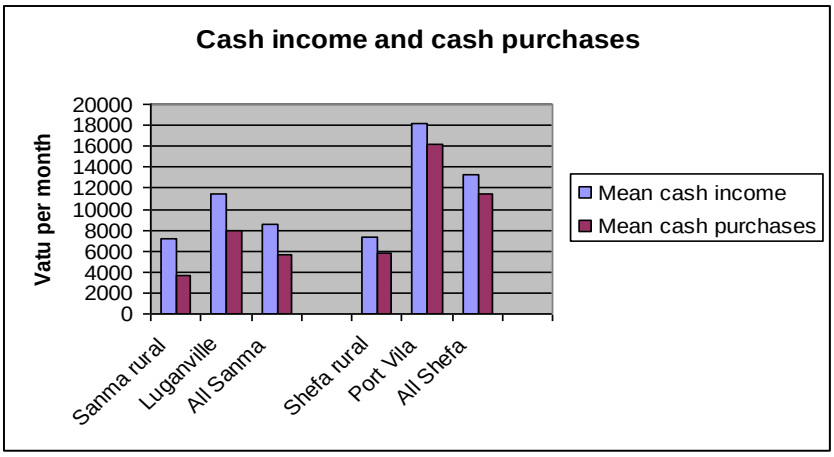
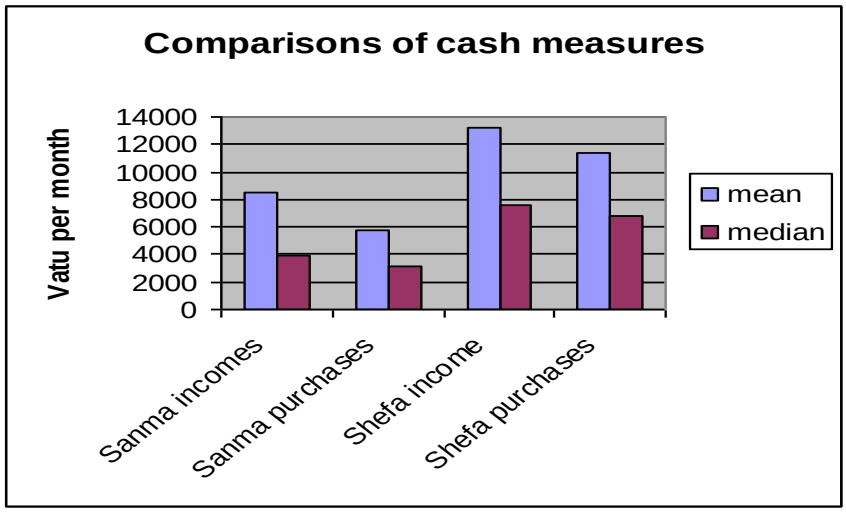


Figure 2.2 Cash income and purchases in the two catchments



[8] The 'All Efate' label includes Port Vila plus all rural Shefa

2.2.3 Cash incomes or cash purchases?

Figure 2.3 Cash incomes – urban and rural

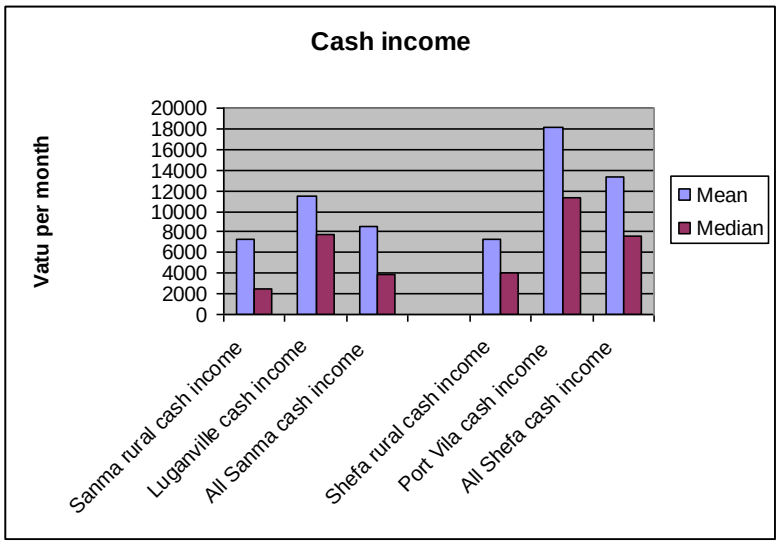


Table 2.3 Alternative statistics for per capita cash purchases (vatu)

	Mean	Median
Sanma	3,669	2,289
Luganville	10,657	8,006
SANMA	**5,718**	**3078**
Shefa	5,803	3,048
Port Vila	16,147	10,698
SHEFA	**11,440**	**6,773**

Note: calculated by the author from 2007 dataset –NSO may wish to check data for inclusion in the M & E plan if used

Table 2.4 Alternative statistics for per capita cash income (vatu)

Province	Mean	Median
Sanma	7,247	2,429
Luganville	11,456	7,782
SANMA	**8,481**	**3,875**
Shefa	7,345	3,957
Port Vila	18,213	11,325
SHEFA	**13,267**	**7,600**

Note: calculated by the author from 2007 dataset – should be recalculated by NSO for inclusion in the M & E plan if used

The report of the HIES includes the Relative Standard Error (RSE) of the estimates of income and expenditure. This presumably relates to the mean total sum of purchases and income for each stratum, rather than the per capita estimate. However it does give an indication of the relative variability of the estimates. It shows particularly high RSE for cash income in Santo, confirming the point about extreme values in Luganville. The standard errors for the expenditures are lower than those of incomes, as would be expected. This supports the assertion that households' income can often be erratic, but the outflow of expenditure is smoother over the year to accommodate consumption needs. For this reason expenditure may be the preferred choice over the various options for income.

Table 2.5 Relative Standard Error from HIES report

	Household Purchases	Household Cash Income
Sanma	7.32	9.93
Luganville	7.35	12.23
Shefa	10.26	8.55
Port Vila	8.70	9.32

2.2.4 Values in the M & E Plan

Of particular concern is the appearance in the M & E Plan of higher estimates for Santo than for Efate. Incomes are expected to be higher in Efate. It is probable that the Santo estimates included some extreme values, but the method of calculation is a little unclear. The auditor recalculated the mean cash incomes of the two islands, using new data files provided by NSO. The mean per capita income was calculated for each household and the results weighted using the person weight, the sum of incomes replicates that which appears in the published HIES report. The results are somewhat different for the results which appear in the M & E Plan (Table 2.6), and have been converted to dollars using the Alevey rate of Vt.106 to the US$.

Table 2.6 Comparison of cash incomes

Mean cash income	Unit of Measurement	M & E Plan	Auditors Estimate of mean per capita income[9]
Cash income per capita – Shefa	(US$)	$1,291	$1,502 **(Vt.13,267/month)**
Cash income per capita - Sanma	(US$)	$2,122	$960 **(Vt. 8,481/month)**

Source: M & E Plan and HIES (2006) data

2.2.5 Recommendations on the per capita cash income indicator

Validity and Reliability:

The catchment area referred to should be clearly defined, to enable the data to be accessible and transparent to users. It is therefore proposed that the data for all of Sanma and Shefa be included in the catchment. This will enable users to compare the M & E results with official statistics from elsewhere in government and will lead to sustainable monitoring systems consistent with Government's own regions.

Comparing with the results in the M & E Plan with the HIES data, the baseline value printed appears far too high. The baseline values in the M & E Plan should be amended using cash expenditure rather than cash income, to eliminate extreme values and problems associated with the highly seasonal nature of cash income.

The mean per capita (unadjusted for adult equivalents) household cash expenditure data from the HIES should be used. The cash expenditures will be measured in year 1 and year 5 using the 2011 HIES.

Several recommendations relate to the conduct of the HIES in 2011. These include the following:

- Longer training of supervisors and enumerators, with particular emphasis on the importance of the diary component and its full and accurate completion.
- Elimination of non-vital areas of questioning to reduce respondent burden. This might include deleting any questions on the person questionnaire relating to health and education which have not been used subsequently. Some of the other income questions – in the diary and for other jobs were never used and could be excluded.
- More frequent visits to encourage households to complete the diary including the possible appointment of a diary assistant.

[9] Individual cash income = income of household/no of adults in household. Statistic used is the mean of individual cash income.

- Taking care to remove large cash purchases from the diary and to include these in the list of purchases in the household questionnaire (section 6). An analysis of major cash purchases found in diaries should be undertaken in order to amend the list of major purchases in the 2011 HIES.

- Conduct of a panel survey in 2011 to reduce the impact of using two sets of independent sampling errors when comparing change between the two surveys[10]. Respondents are sensitive to confidentiality issues and the re-appearance of enumerators at households may cause loss of trust in the confidentiality of the data. A decision to use a panel approach should be accompanied by better publicity about the survey and about how confidentiality is maintained.

- Full metadata on the data cleaning, imputation and aggregation used to compile the cash income and expenditure variables should be compiled and made available as metadata. This will improve interpretability and help ensure that the same methodology is followed in 2011.

- The 2011 survey should be conducted during the same months as the 2006 survey to avoid distortions due to seasonality which will be particularly important in the rural areas, and potentially in the urban areas where tourism is seasonal.

Precision and reporting requirements:

- The precision of the estimates is unlikely to be sufficient to distinguish error from real change. The estimated increase in cash incomes of 25% seems high, and if lower will reduce the likelihood of measuring real change.

- In any case the delivery of the HIES 2011 will be after the final evaluation of the MCA programme. No obvious alternative data source is available. A proxy might be the increase in the number of road users taking goods to market from the Origin Destination Survey, or an increase in the number of small enterprises operating along the roads from the Roadside Enterprise Survey which is discussed later in the report.

Timeliness:

The survey was completed before the project commenced and was well timed for a baseline study. The results relating to income and poverty have not been made available on a timely basis, but this is because the NSO did not have the capacity or knowledge to undertake this highly complex work. The NSO had not previously calculated poverty or household income and required a considerable amount of time and support from international experts to complete the work.

Future surveys to collect this information will be collected after the end of the compact it is therefore not going to be possible to assess the impact of the project on poverty and income before the final evaluation. To ensure that future data is completed in a timely manner full metadata should be completed by the NSO.

[10] Although a panel survey approach is widely recommended by poverty experts as the best methodology for monitoring poverty changes, it does increase the administrative burden on the national statistical office. The author has been advised that the VNSO does not have the resources to do this. The panel survey enables actual changes in household welfare to be measured, and sampling error and issues of precision do not arise in comparing poverty over time. If a panel approach is not possible, then is advisable to focus the available human resources on collecting consumption expenditure data to the highest standard possible.

Integrity:

There is no integrity problem connected with the income or poverty estimates. The data have been carefully checked by a number of international experts, and no signs of interference with the data have been noted. The data were collected according to international norms, and under the provisions of the national statistical law.

2.3 Goal Indicator 2: Reduce the poverty rate

The source for this indicator is the 2006 Household Income and Expenditure Survey (HIES) carried out by the National Statistics Office, with financial support from the MCA.

2.3.1 The proportion of households living below the national Basic Needs Poverty Line (BPNL), in the project catchment area.

Definition: The percentage of households whose total per capita consumption expenditure is below the BNPL in the islands of Efate and Santo, to satisfy the need for coherence it may be preferable to calculate the poverty line for Shefa and Sanmo. This estimate is based on the NSO published poverty line for basic needs and its associated food basket, and is the proportion of households whose per capita cash consumption expenditure is below the BNPL (as defined at current prices, using adult equivalence scales as described in the metadata where each adult is valued at 1.0; and each child under 15 years valued at 0.5).

Commentary: Following the first visit of the quality auditor, and following the recommendations made in her report, The Vanuatu National Statistics Office has sought assistance from the Asian Development Bank and UNDP to produce a Basic Needs Poverty Line (BNPL). The NSO has now published a report on the incidence of poverty in Vanuatu at the time of the 2006 HIES. Poverty rates have also been calculated by Dr Jonathon Alevy a consultant hired by the MCC to carry out imputations on consumption records of poor quality and to make an estimation of poverty in the catchment areas. The results of his work have been included in the baseline data of the M & E Plan. Now that official data has been published by the NSO I would recommend replacing the results of Dr. Alevy in the M & E Plan with those of the NSO/ADB for the reasons described below.

The NSO has been able to produce documentation of the processes used for imputing data; for correcting estimates where data was of poor quality; and for calculating the poverty line and the poverty headcount and other poverty statistics. Imputations for missing or inadequate data have been made by the ADB consultant in collaboration with NSO.

Some of the documentation was made available to the auditor – but not all. In the short time available the auditor was not able to follow all the steps or to replicate the poverty headcount results. Overall the NSO methodology is consistent with the approach taken in most developing countries, and with those of other countries in the Pacific region. In the interests of using a country's official statistics, of replicability in future years, and ensuring consistency between users of data and in particular donor monitoring systems, it is highly desirable to use official statistics wherever possible.

While Dr Alevy's poverty estimates are likely to be valid, there is insufficient metadata to compare his methodology with that used by the ADB and NSO. However the rates calculated by Dr. Alevy appear at first sight to be too high for Efate. He estimates a figure of 37.7% of households in Efate and 14.6% in Santo. The published NSO report using the now official BNPL, show estimates of 27.2% in Luganville and 32.8% in Port Vila, with a rural poverty rate of 10.8%. Using simple population weighted averages of the urban and rural rates the result would be around 16% of households in Sanma and 23% in Shefa; substantially different (and lower) than the figure in the report by at least 10%. However it may be that rural poverty rates in Santo and Efate are different, and higher than in other rural areas. There can be no certainty until the NSO has calculated rates for the islands of Efate and Santo, or regions of Shefa and Sanma. This should be done using the same poverty line for both islands, and separate poverty rates should be calculated for each island region.

Poverty rates are highly sensitive to methodology and price estimates, the important point is that a consistent method is used over time to ensure comparability. It is probably not worth arguing about which method is better, but rather to ensure that the method used is consistent over time and with that of neighbouring countries.

Recommendations Goal 2 – Validity and Reliability:

1. It will be preferable to use the official poverty data for a number of reasons:
    - The metadata used by NSO – although complex and difficult to follow - is available from NSO. It should be fully documented and made available to users.
    - NSO now has the capability, with support, to produce poverty estimates in future years using the ADB methodology and will be able to replicate the process on the 2011 HIES.
    - The poverty estimation methodology is consistent with that used by other Pacific countries, and commonly used in the developing world. This supports comparability and consistency with internationally accepted practices.
    - The Paris Declaration, subscribed to by the donor community, advises donors to support country systems wherever possible in the interests of reducing transaction costs and supporting countries' own capacities.
    - The official estimates are likely to be used by other partners and the international community and it would be advantageous for the MCC to utilise the same data and statistics as others.

5. To request that VNSO and the ADB consultant calculate the poverty headcount and rate for Efate and Santo (or Shefa and Sanma if VNSO preferes) using the same methodology as was used for the official report, this is the VNSO/ADB methodology. To reduce time and costs it may be advisable for the rates to be calculated for the 2006 and 2011 HIES simultaneously. This will also ensure that the methodologies are identical. It should be added that the 95% confidence intervals around the estimates should be calculated to enable users to determine whether any change is significant.
6. The VNSO should prepare a full methodological report on the estimation and imputation processes used to clean the 2006 HIES and to estimate the poverty rates. Exactly the same method of calculating poverty should be used with the 2011 HIES; therefore the methodology used should be clearly documented in a manner which will enable the same process to be followed in 2011 by other consultants and staff in the NSO. Poverty estimates are extremely susceptible to small changes in method and the institutional knowledge can be easily lost if the processes are not well documented. The comments received on the earlier version of the report suggest that some of the procedures for treating large items in the diary are a little uncertain, and a clear methodology for the consumption aggregate construction should be available to the VNSO.
7. A poverty specialist should be recruited in 2011 to estimate and compare the changes in poverty using a common methodology; he or she should also estimate the sampling error around the estimates. It is recommended that an expert who is skilled in developing country poverty estimation is recruited.

8. As recommended in my first report, much better collection of local prices is needed at the time of data collection. As is the calibration (weight or volume) of non-standard units such as baskets of produce. Prices and weights are needed to standardise nationally, the value per unit of the home grown commodities consumed by households.
9. Other recommendations are identical those described for indicator 1, which uses the same data source. These recommendations relate to longer training for enumerators, better field supervision and the treatment of major purchases in the daily diaries completed by household to record consumption.

Recommendations Goal 2 - Precision and reporting requirements:

10. To reduce sampling error a panel survey approach is recommended in 2011. This will mean re-interviewing the same households as were approach in 2006, and having a sound procedure for replacing households that have moved or cannot be found. The NSO have pointed out that households were promised confidentiality and may be confused by the reappearance of enumerators. If a panel survey is carried out then good publicity will be required to explain how confidentiality is preserved and kept secret to the NSO staff alone[11].
11. The results of the 2011 HIES will not be available for the MCA evaluation planned for the end of 2010, therefore there will be no new poverty estimate until 2011. It would be unwise to bring forward the date of the next survey, as this would clash with the population census activities, and would be unlikely to yield useful results. It would be helpful to develop some poverty proxies using the 2006 HIES for more rapid poverty estimation; however this may be beyond the scope of the current MCA programme. Alternative indicators from the roadside enterprise survey are proposed later in the report.
12. Poverty rates change extremely slowly, even in countries which have had large amounts of aid and infrastructure improvement. For example poverty in Rwanda fell by just 3% during the 5 year period covered by the last Poverty Profile, despite improvements to all its major roads, *'At the national level the proportion of the population identified as poor fell from 60% in 2000–01 to 57% in 2005–06[12]'.* This is not atypical; therefore the expected reduction of between 6% and 7% in the compact period which is due to end in 2010 may be optimistic, particularly as no road is yet complete. The poverty estimates are very sensitive to methodological changes and price assumptions it may therefore be difficult to attribute any change in poverty rates to the programme, or to distinguish change from error.
13. The issues relating to timeliness and integrity are identical to those discussed in section 2.2 and will not be repeated.

[11] See previous comment – the panel survey idea was not followed up due to resource constraints.

[12] National Institute of Statistics Rwanda, Profile Of Living Conditions In Rwanda, 2005–06. May 2007 Republic of Rwanda.

2.4 Goal Indicator 3: Increase tourism employment

2.4.1 The number of additional tourist related jobs created in the Efate and Santo catchment areas.

This indicator relates to the number of additional tourism jobs created in the two islands.

Commentary: This is the most problematic of the three goal indicators, as the methodology used was not robust and will be difficult to replicate. The data auditor is proposing using a different data source and changing the consultants' terms of reference for the enterprise survey in 2010.

While timeliness is adequate there are several problems with the other quality indicators which are discussed below.

The **definitions** are so far inadequately defined, for example what exactly is a tourist job? Many occupations which serve tourists also serve the local population – examples of this are bank staff, retail shop workers and bus drivers.

The **data source** was intended to be the Tourism Survey Baseline Study which was conducted in 2007/08. The consultant had a number of data quality issues relating to the survey and doubts whether reliable employment estimates could have been obtained from such a study. Good quality data will be hard to obtain from the survey for the following reasons:

- **Lack of exhaustive frame** for selection of all tourism enterprises, see comments below.
- **Difficulties in defining the universe of enterprises** in scope – and inconsistencies in the enterprises selected and those omitted. The tourism database from the Vanuatu Tourism Office was used this includes:

  Tour operators and sporting activity operators; Hotels, motels and bungalows etc.; Airlines; Car and scooter hire; Restaurants; Wedding coordinators; Shops including, handicrafts, art galleries and museums; fashion boutiques; duty free shops; florists; beauty salons; hair salons, commercial banks, media and newspapers; medical centres and clinics; dental surgeries; Nightclubs and bars; some large supermarkets such as Au Bon Marche.

- **Unclear definition** of what a tourist job is (appears to include only employees working in the companies listed above – not other categories of employment)
- **Non-random selection processes** used (companies who responded were included in the sample).
- **Low response rates** (24%).

  '*The Business Survey was emailed out using the Vanuatu Tourism Office database of approximately four hundred and twenty seven companies operating in the sector in Vanuatu. Follow up emails and telephone interviews were undertaken between September 2007 and February 2008, to increase the response rate to the targeted*

level. A total of 103 questionnaires were completed within the survey period, against an original target of 100[13]*.*

- **The use in the questionnaires of wide employment ranges** to capture numbers of employees which would result in a lack of precision.

Table 2.7 Employee ranges used

1 – 3 employees	13 -15 employees	31 – 40 employees
4 – 6 employees	16 – 20 employees	41 – 50 employees
7 – 9 employees	21 – 25 employees	50 – 100 employees
10 – 12 employees	26 – 30 employees	100 plus employees

- **Omission of unpaid family workers from the questionnaire**. The questionnaire is not appended to the report, but the report quotes numbers of employees (see table below)[14]. The HIES indicates that over 20% of the employed persons in tourism related industries are family workers – a category excluded by the Trip Consultants survey.

Table: Numbers of employees in the sample broken down by Islands

Number of full time employees in the sample	EFATE	SANTO	MALEKULA	TANNA	OTHER	Total
Number of full-time employees	1009	140	2	68	30	1249
Breakdown	80.8%	11.2%	0.2%	5.4%	2.4%	100.0%
Number of part-time employees in the sample						
Breakdown	295	66	5	25	148	539
	54.7%	12.2%	0.9%	4.6%	27.4%	100.0%
Number of expatriate employees						
Breakdown	48	4	0	0	2	54
	88.9%	7.4%	0.0%	0.0%	3.7%	100.0%

Source: Page 10 Appendix iii H: Key Findings from The Tourism Business Survey

- **Doubtful grossing up procedures.**

The estimates obtained from the Tourism survey were adjusted by the value added estimated from the visitor survey conducted by the same consultants. This is described below by Alevy, but it should be noted that the 18 billion Vatu is not derived from the National Accounts as stated by Alevy – but from the visitor survey also conducted by the TRIP consultants. In fact

[13] MCA Vanuatu – Tourism Survey – Baseline Study Final Report

[14] It should be noted that work includes unpaid family workers, paid workers, and proprietors. While these could have been included by respondents it is not certain that they were.

the value added for accommodation and meals in the TRIP report of 3.82 billion vatu exceeds 2.94 billion vatu which is estimated in the Vanuatu National Accounts for 2006[15].

> *'Table 5 presents additional information on the tourism sector. The extrapolation factor (EF) of 2.57 used in Table 5 is derived from the[*business survey*] survey sample turnover of 7 billion Vt and the national account estimate [*visitor survey is the source*] of total turnover of 18 billion Vt, so the EF = 18/7 = 2.57. Thus estimates of FTE employment derived from the survey of 1155 in Efate and 166 in Santo are multiplied by the EF to get an estimate of the province-wide employment.*[16]*,*

- The estimates drawn from the TRIP survey are printed in the M & E Plan as 2,968 and 427 respectively. It is my view that adjusting employment on the basis of turnover and total tourist spend is unlikely to be a good method of grossing up employment. There is no demonstrated correlation between turnover and employment, and businesses are likely to understate their turnover for a variety of reasons. All the variables in use are subject to error – this includes tourist spending, business turnover and employment. Grossing up from one to another is unlikely to yield an accurate result. The HIES data – though error prone – may be a more reliable source than is the TRIP data.

- **Lack of corroborative data from other sources.** Using both occupation and industry classifications the HIES estimates of persons working in tourism related jobs in Shefa and Sanma are in the order of 1,800 and 420 respectively. In Efate this is much smaller than the Tourism Survey estimate of 2,968 full-time equivalent employees (see commentary below)

- **Difficulties in replicating the survey (from an unknown sample) in 2010.** The list of responding companies is presumably known to the consultants, and to ensure comparability in 2010 the same companies should be interviewed, together with a sample of newly formed enterprises. The quality of the results will be difficult to assure, but more importantly the grossing-up factor remains hugely problematic. The proposed formal and informal enterprise survey may provide better information for grossing-up the 2010 tourist enterprise survey according to the size of the enterprise; however this will not solve the problem of the baseline data.

- **Concerns about the validity of the data.** Some stakeholders have suggested that the results of the tourist enterprise survey may have been biased. There is no evidence for or against this assertion but trust in statistics is a valid quality concern and this should be addressed by closer collaboration between the consultants and the VNSO. The report should clearly separate out the opinions of the consultants from the empirical evidence provided by the surveys undertaken, in line with the UN fundamental Principles of Official Statistics. The other visitor surveys undertaken appear to be of acceptable quality and the findings consistent with those of the similar survey of 2004. There is no reason to dispute the findings of the visitor surveys although these have not been inspected closely, as the results are not used directly in the list of MCA indicators.

Commentary: The Revised Monitoring and Evaluation Plan quotes baseline numbers of 2,968 tourist jobs in Efate and 427 in Santo. Given the lack of robustness of the instrument this appears to be rather a spurious level of accuracy.

[15] National Accounts, NSO 2007 edition

[16] Jonathan Alevy, Transport Infrastructure Evaluation Indicators for Port Olry Road, Santo & Round Island Road, Efate, MCC, October 2008, Updated December 13, 2008

The quality auditor looked for alternative data sources to corroborate the tourism surveys results. The HIES data was used to construct tourist related employment, using both occupations related to tourism in the broadest sense; and as a separate exercise tourist related industries in which the respondent was working according to the HIES.

The estimates from the HIES source are also subject to sampling and non-sampling errors, but sampling errors of the HIES can be calculated, and the many of the non-sampling errors are reduced due to much higher response rates. The estimate of the total number of paid private employees is consistent with the National Provident Fund totals. The estimates from the HIES are also capable of being compared with other sources such as the forthcoming Informal and Formal Survey, the Population Census (2009) and can be more easily replicated in the next HIES. Comparability is a major consideration in comparing trends in project monitoring. The baseline methodology must be repeated as closely as possible.

In terms of defining tourism jobs, these should include all those working (as employees (full-time and part-time), as proprietors, or those working unpaid in family business) in the following industries. The auditor explored the choice of occupation or industry. After a long consideration banking was excluded, as it was thought that most tourists would use ATM machines and banking was more indirectly connected with tourism industries. 15 occupations were selected and ten industries, which are listed below. In Shefa the results give us 3000 workers in tourist occupations, but just 1700 jobs by industry. In Sanma the workers in tourist occupations are 870, and by industry 420. In other words the two categorisations are not consistent. A closer inspection of the data provides an explanation. The occupational codes also include those people who describe their industry as a private household or an international organisation. 850 Shefa workers, and 220 workers are classified as working in private households. A further 210 and 50 workers are classified as 'extra territorial organisation' as their industry. This explains 1060 of the 1,300 job difference in Shefa; and 470 of the 450 difference in Sanma. This suggests that the estimates are reasonable consistent, but of the two classifications industry provides the most consistent and easily used definition.

Table 2.8 Tourist occupations by province

	Shefa	Sanma	Other Rural	Total
Managers in hotels	18	0	0	18
Musicians, artists and creative	125	0	18	143
Sports workers	36	0	9	45
Air and ship technicians	54	73	22	149
Travel agents	48	0	0	48
Travel and information clerks	18	17	0	35
Travel Attendants and Guides'	199	26	39	264
Hotel and catering workers	668	147	80	895
Personal service workers	156	23	52	231
Shop and market Salespersons	853	320	1038	2211
Handicraft workers	134	11	110	255
Bus and vehicle drivers	567	200	303	1070
Boat & ship crew	76	40	52	168
Street vendors	46	16	16	78
Total	**2998**	**873**	**1739**	**5610**

Table 2.9 Tourist related industries

	Shefa	Santo	Other rural	Total
Retail Trade of general merchandise goods	143	57	125	325
Hotels & Rest houses, Motels	332	17	55	404
Restaurants and cafes	365	63	4	432
Land Transport via Pipelines	263	101	136	500
Water Transport	59	80	14	153
Air Transport	165	16	20	201
Motion picture and similar entertainment services	0	11	0	11
Other Personal Service Activities	164	72	133	369
Libraries, museums and other cultural services	18	0	17	35
Recreational, Cultural & Sporting Activities	179	6	54	239
Total	**1688**	**423**	**558**	**2669**

Using industry, the estimate for Shefa appears to be approximately 1,700 jobs, based on industry codes, while that of Sanma is around 423. This seems to be largely confirmed by the occupational codes when those working in private households and international organisations are removed. Obviously many of these industries also serve the local population – as is evident for the results for 'other rural'.

Had the consultants been able to interview all those enterprises listed by the tourist office and asked more precise employment questions, or had drawn a sample which had allowed the results

to be grossed-up by size and type of industry then the results may have provided a better alternative. Now it is too late to provide alternative baseline data.

Returning to the enterprise survey results – where the estimates of tourist employment contrast with those of the HIES. It is clear that the estimate in Efate is much too large. In addition to this the HIES includes family workers – either unpaid or working in household businesses these categories are regarded by the ILO as employed – these workers were not covered by the enterprise survey, these are estimated to be 350 workers (although the sampling error will be high for such a small number). The enterprise survey estimate for Efate seems much too large.

Table 2.10 Comparison of the Enterprise Survey and HIES results of tourism jobs

	Enterprise survey	2006 HIES	Number of family workers
Sanma	400	430	151
Shefa	2,968	1,800	205
Total	3,368	2,230	

The Enterprise Survey estimates therefore overstate tourism employment. While not all employment in these industries can be attributed to tourism, and not all of that to the MCA programme. The estimates from the HIES have the advantage that they:

- Can be estimated using the HIES, and corroborated using the population census or other regular household survey.
- They are sustainable and likely to be collected by the NSO on a regular basis.
- The definition is clear and unambiguous.
- Family workers (paid and unpaid) are included who are likely to be found in many smaller enterprises in the rural areas of Efate and Santo.

  Alternative indicator: I have looked at the results of the employment questions in the road-side enterprise survey. These results have the advantage that they are conducted by the MCA itself, and the response rates are known and data collection can be easily supervised. The respondents are 100% of all enterprises and household businesses which are situated directly within 2 km of the road and are therefore direct beneficiaries of the road improvement. This survey can be easily replicated at a low cost, and the results are available in time for the evaluation of the MCA programme. The results of these surveys can supplement the HIES results and provide timely information for the evaluation.

Indicator 3 Recommendations:

20. To make a major revision to the baseline numbers of workers (paid employees, self-employed and unpaid family workers) in service industries in Santo and Efate from the HIES. The methodology is clearly defined and the result is consistent with the published

official estimates, and the metadata is available to stakeholders. The result is capable of being replicated using the 2010 HIES. It can also be checked in the 2009 Population Census.

21. Abandon the business survey carried out by the consultants and replace this with a hotels survey – to be described below. The lack of precision in the employment estimates will also impact on the estimates of tourism earnings. While it is appreciated that some data is better than no data, the ideal would be for NSO to conduct a robust national income inquiry among scientifically selected enterprises for national accounts purposes.

22. The results of the roadside enterprise survey should also be added as a more direct measure of roadside enterprise and employment generation. An additional indicator should be included on the number of enterprises and employees situated on the Efate ring road and East Coast Santo Road.

- The baseline figure for Efate is 247 businesses and 248 persons employed. In Santo the enterprise survey showed 113 enterprises and 145 people employed.

23. The methodology for the roadside enterprise survey should be written up in a report that will allow the survey to be replicated in 2010. The original instructions have been lost following the loss of the MCA computer hard disk.

2.5 Additional intermediate goal indicators recommended

The three goal indicators are unlikely to show significant change in the period from year 1 and year 5, as the programme is due to end next year and no road is yet completed. Much of the change measured will be attributable to sampling and non-sampling data errors, and the latter cannot be measured. Therefore the results of the goal indicators will be unlikely to be useable with any degree of certainty.

The final evaluation will take place at the end of 2010, and a simpler set of more easily measured intermediate indicators is recommended for this, based on the tourism surveys conducted by TRIP and using the surveys which have been managed and implemented by the MCA.

2.5.1 Intermediate indicator 3: Number of roadside enterprises and employed persons

Two roadside enterprise surveys (as discussed above) were conducted by the MCA, in Efate the fieldwork took place between 23 and 25 April 2008, while in Santo the dates were 30 April 2008 – 2 May 2008. The surveys sought to identify and interview all enterprises along the roads being improved in Santo and Efate.

This survey could be used to generate a new indicator which could be monitored regularly – perhaps yearly. The enterprises are directly in the catchment of the road programmes and any increase in their numbers or workers could be more directly attributable to the Compact – and this would be:

The number of enterprises and the numbers of persons employed in enterprises situated on the Efate Ring Road.

The number of enterprises and the numbers of persons employed in enterprises situated on the East Coast Santo Road.

The baseline results are:

	Number of Enterprises	Number of persons employed
Efate	254	472
Santo	106	300

Note: (Number of persons employed include: employees (full and part-time), proprietors and family workers)

The results of the roadside enterprise survey have been collated and tabulated by the Economist in the MCA and further analysed by the Auditor. They have yielded useful results which are appended in Annex C. The results are summarised below.

254 enterprises were identified in Efate and 106 in Santo. It should be note that the number for Santo is only for the first 30km of road as previously MCC funding was to fund only 15km seal and 15 standard upgrade but now that NZAID has provided enough money to complete the 57km it means that there should be more business in the remaining 27km that was not surveyed. The Efate enterprises employed 472 persons and the Santo enterprises 300 persons. Around one half of those working in roadside enterprises were family members rather than employees (this point should be noted in relation to the tourist employment information collected by TRIP which excluded this category of employment). 17% of enterprises had been operating for a year or less and a further 42% for 2 to 5 years. The mean age of enterprises was 7 years in both islands.

The dominant activity was retailing, baking and transport enterprises. In Santo some 37% of workers were employed in agriculture, while in Efate 14% of workers were engaged in tourism.

Table 2.11 Type of employment in roadside enterprises

	Efate		Santo	
	No. workers		No. workers	
Number of Full time Employees	147	31%	90	30%
Number of Part time Employees	70	15%	72	24%
Number of Family Workers	255	54%	138	46%
TOTAL	472	100%	300	100%

Table 2.12 Enterprises and employment by industry

	Efate	Santo	Efate	Santo
	Employment		**Enterprises**	
Agriculture Production	7%	37%	2%	4%
Bakery	7%	4%	11%	8%
Hotel, Bungalow & Resort	3%	4%	2%	2%
Kava Bar	6%	4%	9%	9%
Open Air Vendor	8%	1%	8%	1%
Other	4%	3%	4%	4%
Restaurant & Café	5%	2%	3%	1%
Retail Trade	31%	33%	41%	50%
Sawmill	3%	3%	1%	7%
Tailor	2%		3%	0%
Tour	15%	4%	4%	3%
Transport	10%	6%	13%	12%
Total	**100%**	**100%**	**100%**	**100%**

2.5.2 Intermediate Indicator 4.1: Percentage of tourists travelling to other parts of Efate

The Tourism Survey conducted by the consultants is a useful information source, and its results relating to international visitors could be used in the M & E Plan. One potential impact of better roads is that an increasing number of international visitors visit other destinations in Efate and in Santo. These results can be extracted from the tourist survey of 2007, which is due to be repeated in 2010. These would provide useful information for the forthcoming evaluation.

Information can be obtained from the Air Departures Survey Q11 & Q12 and from the Cruise Passenger Survey Q8a. The baseline results are extracted from the survey report published by TRIP.

Percentage of international air visitors travelling to other parts of Efate:

Baseline 2007: 59%

Definition: Proportion of visitors arriving by air who visit areas of Efate beyond Port Vila.

Percentage of Efate cruise visitors travelling to other parts of Efate:

Baseline 2007: 37%

Definition: Proportion of visitors arriving in Vila by cruise ship who visit areas of Efate beyond Port Vila.

Percentage of international air visitors travelling to Santo:

Baseline 2007: 10%

Definition: Proportion of visitors arriving by air who visit Santo during their visit.

Quality issues: The report is rather difficult to follow from the point of view of auditing and making use of the results. I would recommend that future report from TRIP provide separate sections on full tabulations and commentary about the tabulations; a methodological section outlining data treatment and potential data problems; and a section of further analysis which attempts an analysis of the data, and includes the opinions of the authors. Separating fact from opinion and obtaining full data for interpretation is not always possible.

The Yacht sample is probably too small, and the sampling errors too large for useful results, and has not been included in the indicators above.

In general the visitor survey is of reasonable quality and the indicators selected should be able to be used in the M & E Plan. However some arithmetic errors have been spotted. An example of this is the statement that 22.6% of all tourism expenditure went on local transport; they calculated this as 3.3 billion vatu. However, if you do the maths, then 3.3 billion out of 17.9 billion vatu is 18.4% and not 22%.

The results are timely and the integrity of the data appears to be good, although the unit records were not available for inspection.

2.5.3 Intermediate Indicator 5: Tourist spending in Vanuatu

Spending by tourism is of considerable importance to the Vanuatu economy – according to the consultants it may comprise up to 20% of GDP. It would be helpful if this indicator could be included in the list of MCA indicators.

The 2004 Visitor Survey report publishes a total visitor expenditure of Vatu 7.865 billion[17], this only covers visitors arriving by air and is therefore comparable with the Vatu 9.735 billion expenditure estimated from international air tourists in 2007. Tourism has risen by 32% and expenditure by 24%.

Total expenditure by international visitors by air:

Baseline 2007: Vatu 9.7 billion

Definition: Estimated total expenditure of air visitors to Vanuatu.

An alternative might be per capita expenditure which would be Vt. 119,675

[17] Page 11, 2004 Visitor Survey Report, NSO, Port Vila

3 Objective and outcome indicators

Objective Indicator 1: Facilitate Transportation to increase tourism, business development and agricultural production

Four objective and outcome indicators have been set for the two sub-projects. These will be addressed in turn.

3.1 Number of hotel rooms constructed

Objective Indicator 1.1: Number of new hotel rooms constructed

1.1.1 Cumulative number of new hotel rooms constructed – Efate

1.1.2 Cumulative number of new hotel rooms constructed – Santo

This indicator has proved to be difficult to collect. The MCA economist has pursued a number of officials to try to determine a reliable source. The two authorities of Santo and Efate rural have proved to be reasonably reliable sources, but the authorities of Port Vila have no formal mechanism operating to authorise the completion of new hotel rooms, and do not keep a comprehensive list of hotels with room number. A proposal to award hotel rooms a tourism rating standard may be useful in the future, but to date no reliable source has been found. The indicator lacks good quality baseline data, and has no prospect of obtaining good information in the near future. The indicator is of doubtful quality until reliable records are kept.

Recommendations on indicator 1.1: Number of new hotel rooms

1. Economist is to keep in contact with Vila authorities to pursue a better data source.
2. Until a better source is found, this indicator should be abandoned as of insufficient quality because of the lack of cooperation of Port Vila hoteliers with the government.
3. As an alternative it is recommended that the consultants divert their contract resources away from the Tourism Business Survey to a specific hotels census. The consultants are said to have good relationships with many of the tour operators in Vanuatu and may be more successful than the NSO in getting the hoteliers to cooperate with surveys.
4. The proposed hotel census should cover all hotels in Efate and those in Luganville and in the catchment of the Santo East Coast Road. The informal and formal sector survey should provide a register for this census, but additional research will be required to establish if any new hotels have been added or have been closed since that survey.
5. The following areas of questioning should be included in the hotels census.
    a. Number of rooms and bed-spaces available for letting.
    b. Number of room and bed-spaces which have been constructed since 2006, with the year of completion clearly indicated.
    c. Plans for constructing future accommodation – with reasons
    d. Numbers of persons employed – males, females, ni-Vanuatu, expatriates, proprietors, full-time employees, part-time employees, unpaid family workers.
    e. Increase – decrease in staff numbers in the last 12 months.
    f. Turnover – if this can be collected without impacting negatively on response rates.

3.2 Number of international tourists

Objective Indicator 1.2: Number of International Tourists (arrivals) per annum

1.2.1 Quarterly number of tourist visitor arrivals. This is collected by the immigration and customs officials, processed by the NSO and is of good quality. It is available on a monthly basis. No problems are anticipated with these data. The figure posted M&E Plan of 61,453 contradicts the NSO official visitor number of 62,123 for 2005. It should be noted that the Year 5 has already been exceeded – and stood at 90,657 in 2008 – the MCA target is 87,743. The official estimates are found in Annex D.

The first visit of the data auditor recommended that the Ministry of Internal Affairs add an additional question to the departures card for visitors. This question would ask which islands visitors had during visited during their stay – the response categories would be the 5 main islands and a code for others. The suggestion has been well received by the authorities. When existing stocks of cards have been exhausted new forms will be printed asking questions about visits to the main islands.

The data is of good quality, part of official statistics and is produced on a timely basis. It is collected with high integrity.

Recommendations on indicator 1.2: Number of International Tourists (arrivals) per annum

1. Revise the baseline number to conform to the official published data, unless there is a good reason to depart from this, in which case the reasons should be clearly footnoted.
2. The MCA may wish to review the target in the M & E Plan as this has already been exceeded. Meeting this target is clearly not the result of the M & E Programme, as no road has yet been completed.

3.3 Traffic volume on the roads

Objective Indicator 1.3: Traffic volume (total daily average number of vehicle on the road)

The Auditor was able to assist the MCA Economist process the data collected from the traffic survey. The baseline data in the report relate to data collected in 2008, and represents the sum of the average numbers of vehicles passing at 4 traffic points in Efate and 3 in Santo. Vehicles can of course pass several traffic counter points therefore they may be an element of double counting, however the estimate should be sufficiently robust for the purposes of the monitoring as long as it is clearly defined.

1.3.1 Efate ring road: the baseline estimate of an average 860 vehicles per day appears robust, but there is an element of double counting which is discussed below.

The definition is the sum of the average number of vehicles passing over 4 checkpoints on the Efate Ring Roads over a 7 day period.

1.3.2 Santo east coast road**:** the baseline estimate of an average 920 vehicles per day appears robust, but there is an element of double counting.

The definition is the sum of the average number of vehicles passing over 3 checkpoints on the Santo East Coast Road over a 7 day period.

These data are to be collected in the Baseline year, Year 4 and Year 5. A traffic volume survey was carried out since the Auditor's last visit, and the data were inspected and worked on during this mission to produce additional results which may be helpful for use in the evaluation.

The data is timely and of good quality. There are no concerns about its integrity.

Recommendations on indicator 1.3: Traffic volume (total daily average number of vehicle on the road)

The totals computed will include some double counting as several vehicles can be expected to cross over more than one traffic counter. From the passenger survey it is known that a high proportion (71% Efate and 42% Santo) of vehicles travelled over 11 km on their trips, therefore there is a high probability that vehicles will be double counted by the traffic counters. However as long as the indicator is clearly defined in the M & E Plan as the sum of the average number of vehicles passing over a number of checkpoints on the roads then this should be unproblematic as an indicator. As formulated the indicator will not only capture the number of vehicles on the road, but any increase in journey length due to better road conditions will also be captured in the indicator.

Recommendations on indicator 1.3: traffic volume

1. To clearly indicate that the indicator refers to the sum of the average number of vehicles passing over selected checkpoints on the road concerned.

3.3.1 Results of the passenger survey

In addition to the traffic counters which count the number of vehicles passing, there was a roadside passenger survey whose proposed methodology was described in the first audit report. While the results of this survey are not proposed as an indicator in the M & E Plan, the results will

be invaluable for the final evaluation and could potentially form the basis of an indicator in any future MCC programmes in the country.

The brief results of the passenger survey are as follows. The most common road users were drivers of pick-up trucks (47%); Efate had a higher proportion of buses (26%) using the roads, than Santo (11%). 40% of vehicles were driven by their owners, but in Santo 38% were driven by employees of the owner, compared with just 17% in Efate. Hire cars were much more common in Efate (18%) than was the case in Santo (1%). Relatives and friends of vehicle owners were more likely to be driving vehicles in Efate than they were in Santo

Business use was much more significant in Santo (84%) than it was in Efate (69%). This is consistent with the findings on use of vehicles for pleasure in Efate, where 17% of cars were being used for pleasure and another 14% for social activities. In Santo only 2% of journeys were for pleasure and 7% social use. Any tourism impact of the upgrading of the Santo road would require much greater use of the road for leisure purposes.

Business was a major reason for the journey in Efate (38%) and Santo (25%), but going to work or school was more important in Santo (59%) than in Efate (18%). Almost three quarters of journeys were made regularly. Journeys were shorter in length in Santo with 30% of journeys reported as less than 5 km in length. This compares with Efate where only 17% of journeys were less than 5km, and almost half were between 6 and 20 km.

For those whose journeys were for business 35% of Efate trips were made for family business reasons, 21% were made for larger more formal businesses with premises, and 35% were (public) transport companies primarily taking small traders to market. In Santo 82% of business trips were classified as public transport, which are largely private vehicles used as shared transport.

Full tabulations and the methodology for treating the results can be found in Annex E.

3.3.2 Quality issues

The survey seems a very valuable way of tracking the use of the road over time, and indicating who the major beneficiaries are of the road. The users of the two roads are currently very different and should prove helpful to those evaluating the MCA programme. The type of use to which the road is put is very different between the two islands and the use of the roads can be expected to change as the completion of the road improvements occurs.

The survey took place between 27 May to 2 June 2008 on Efate, and 20th to 28th August 2008 on Santo, although the majority of interviews took place from 20th to 24th August 2008. 386 interviews were conducted in Efate and 270 in Santo. It is thought that a passenger cruise ship was moored in Vila harbour during the Efate survey which may have had an impact on the results.

The enumerators were reported to have needed more supervision, especially in Efate, and this can be seen in the quality of some of the questionnaires, which lacked vital dates and times to enable the survey to be appropriately weighted by the results of the traffic counters. The methodology, the data treatment and the weighting of the data to represent road usage using traffic counter information can be found in Annex E.

The data has not been reported in a timely way, largely due to the lack of a computer system for processing survey data. The integrity of the data is good, unit records were inspected. Oversight by NSO of the data may reassure any users of its quality and freedom from influence by the MCA.

Recommendations on the Roadside passenger survey:

1. The enumerators should be fully trained and supervised during the survey. Supervisors should be appointed to check the completeness of the work during data collection, and to ensure that enumerators do not cheat, skimp, leave omission or falsify information.
2. Written instructions are needed for the interviewers.
3. The dates of interviews in the database look a little suspect, therefore better quality control and editing of the data is needed to eliminate erroneous dates. Where possible the interviews should coincide with the traffic counters activity, this will ensure that the weighting procedures relate the interviews to the physical counts of data.
4. Account should be taken of the presence of cruise ships in the islands. It is understood that a cruise ship was in Vila at the time of the previous survey. This may have an impact on the survey results.
5. The origin and destination codes should be grouped by area and traffic counter segment to allow an analyst to estimate the proportion of traffic crossing over the traffic segments. The majority of Efate journeys originate and/or end in Port Vila and the Vila results should be grouped. A similar situation is found in Santo with journeys centred on Luganville.
6. The MCA economist is will require additional support to undertake the data collection to the quality standards require, and to relieve him of some of the pressure. The support needed includes:
    a. SPSS or similar survey package – and training - to analyse the results.
    b. Support to develop computerised data-entry routines which incorporate edit checks and improve data quality.
    c. Additional human resources to supervise and train enumerators.

3.4 Number of days road is closed

Objective Indicator 1.4: Days road is closed (number per annum) Efate Ring road

These data are collected from PWD – due to illness and time constraints this indicator was not reviewed. The MCA Economist reported no problems with this straightforward indicator.

3.5 Improved road maintenance

Objective Indicators 2: Improved road sustainability through increased funding and improved maintenance.

Objective Indicator 2.1: Share of road length in 'fair condition' (percent)

The exact calibration of this indicator was discussed at length and piloted in Efate in the first visit of the Data Quality Auditor (2007). Since this first visit, the same exercise was carried out on the Santo East Coast Road. This was carried out in 2008 after the road had benefitted from routine maintenance prior to its handover to the contractors responsible for construction. The proportion of road in fair condition was estimated to be 94% - a score which does not represent the true baseline condition of the road. There is little to be done retrospectively to redress this situation.

The Auditor was unable to inspect the data due to the complete loss of the computer hard disc of the MCA economist – and the unavailability of back-up. The measure is of course subjective and would benefit from the presences of a neutral person if it conducted on another occasion.

The exercise should be repeated at the end of the MCA programme.

4 Institutional strengthening:

Indicator: Annual PWD Score estimated as a composite for all 8 key performance indicators.

The scheme for scoring PWD performance was devised on the first data quality mission. The first assessment took place in 2008 and achieved a score of 14 points out of a maximum possible score of 40. The reasons for the low score were assessed during the mission and described in the following paragraphs. There are several quality assurance issues, but it is the view of the evaluator that the quality constraints are more likely to lead to unrealistically low scores rather than high scores.

At the operational level low scores were partly achieved due to very late disbursement of funds to the Public Works Department (PWD).

However there are other systemic reasons for the low scores. This is the lack of a fully computerised record system in PWD, and difficulties in ensuring that all clerks of works and foremen in the island submit quantitative data in their reports. Despite contracts being let with clear quantities of roads to be maintained in metres and kilometres, this is not linked to a progress reporting system which reports back to headquarters on quantities achieved.

A new quantitative performance tracking form is being used this year, this is appended in Annex F. It is hoped that there will be a better reporting system in place in 2009 and this will improve further with AusAid support to a computerised system.

The following issues led to very low scores in 2008

1. Late disbursements of funds. The 2008 road fund was released in November 2008, and for 7 months no funds were available for maintenance due to the state of the Government's cash flow.
2. High rainfall throughout the country led to diversion of available resources to dealing with emergencies which were not foreseen in the performance contract.
3. Lack of private sector capacity in fulfilling all the anticipated works.
4. Difficult to get the PWD staff in the islands to complete the proforma reporting progress in an accurate quantitative manner, despite attempts to train them.
5. Lack of expertise to set up a fully computerised system – a database is to be set up supported by AusAid.

The Director of PWD demonstrated reports and forms which were of a more quantitative nature, the following recommendations are made:

Recommendations on PWD score indicator

1. Develop the AusAid computer system to meet the MCA reporting requirements.
2. Introduce a contract tracking system which maintains constancy in the quantities and lengths of road being maintained throughout the period of contract implementation.
3. Improve the training in form-filling for all those involved in reporting on progress of road maintenance.
4. Standardise the ways in which maintenance of road sections are measured and reported.

4.1 Support to NSO and MDG monitoring

One aspect of the MCA programme which has not fully been recognised is the contribution made to statistical capacity in Vanuatu. Not only is this information important to the MCC, but it will also allow other development partners to monitor their programmes in respect of poverty, and will also provide information for statistical users in the country.

The HIES has allowed the NSO to report for the first time on:

- The incidence of poverty in Vanuatu – this has allowed Vanuatu to produce for the first time data on Goal 1 Eradicate extreme poverty and hunger.
- Consumption expenditure and cash incomes. This information has enabled NSO to modernise two key economic series
    - CPI – the CPI was last rebased in 1983 the HIES data has enabled a new rebased CPI to be produced
    - National Accounts has been improved.

The tourism survey has improved the regularity of more detailed tourism information and facilitated better estimation of tourist income for national accounts. The forthcoming formal and informal business survey will further support better national accounts and economic data in the country.

5 Additional evidence on the estimation of poverty

5.1 The calculation of poverty lines and poverty estimates

The National Statistical Office of Vanuatu is charged with the collection and publication of official statistics. It was responsible for carrying out the 2006 Household Income and Expenditure Survey (HIES; it has now published its final report as an official statistical publication. In addition to this report the NSO has been assisted by the Asian Development Bank and UNDP in developing a poverty line and poverty estimates for the country. These have now been published and constitute the official statistics on poverty in the country.

In 2008 the data quality auditor identified several data quality challenges to the HIES – and identified some 228 records which appear to have inadequately captured expenditure. These records have been replaced by imputations made by the MCC consultant, Jonathan Alevy of the University of Nevada who has recently provided the MCA programmes. His report to the NSO summarises the imputation method as follows:

> *'The original imputation method identified a single donor whose location, household size, quality of structure, and other characteristics made it the 'nearest neighbor' to one of the 228. Once the donor was identified her cash income replaced the cash income value for her neighbor. The alternative imputation makes use of several regression models so that the imputed value for any household is a linear combination of the values of similarly situated households*.[18]'

The NSO with the support of the ADB has also carried out imputations and further editing to the data in the production of its poverty estimates. The NSO poverty rates have been calculated as three separate domains: rural Vanuatu, Port Vila and Luganville. Given the very different living conditions of the three populations in these domains, this is a reasonable approach, and takes account of some of the data limitations. A number of issues concerning the NSO poverty estimates should be noted;

> The cost of a minimum food basket in Port Vila is around twice the value of that in rural areas. This is accounted for by different dietary habits and the predominance of the cash economy in Port Vila. Those in the rural areas consume the majority of their food from their own gardens or those of the community, while residents of Port Vila tend to buy their food from a much more diverse choice of items. While it would be possible in theory to derive a common value of the diet, this would rely on having good spatial deflators, and these do not exist and the diets of the urban and rural populations are too different from one another. Therefore the decision to publish different costs for different domains is entirely reasonable.
>
> For non-food needs (NSO/ADB) the costs of the rural dweller is estimated to be just 13% of those of the Port Vila inhabitant. The rural dweller has quite different, and less expensive, housing, utilities, clothing and other costs. The inhabitant of Luganville has needs somewhere between those of Port Vila and the rural areas. The values of the poverty lines are set out in Table 5.1.

[18] Jonathon Alevy, 'Transport Infrastructure Evaluation Indicators For Port Olry Road, Santo & Round Island Road, Efate, University of Nevada – Reno, October 2008

Applying this line to the HIES expenditure data gives results which may not have been entirely anticipated – the highest poverty rates are to be found in Port Vila, and the lowest rates are to be found in the rural areas. This is because poverty is a relative concept comparing households' consumption with the costs of the basic needs of individuals living in it, and the needs differ markedly in the three domains. Needs are much higher in Port Vila. Food poverty in the country is relatively low, just 7.4% of the population, with a slightly higher incidence in the rural areas. However adding in the non-food needs the rate for individual is pushed up to 15.9%, with the highest incidence in Port Vila (32.8%).

The BPNL of the three domains is as follows:

Table 5.1 Basic Poverty Needs Line

	Port Vila	Luganville	Rural Vanuatu
Food Poverty Line	5,034	3,594	2,589
Non-food basic needs	6,041	2,516	777
Basic Needs Poverty Line	11,075	6,110	3,366

Table 5.2 Incidence of poverty (population)

	Port Vila	Luganville	Rural Vanuatu
Food Poverty Line	5.4	2.2	6.6
Non-food basic needs	32.8	`10.9	10.8

Table 5.3 Incidence of poverty (households)

	Port Vila	Luganville	Rural Vanuatu
Food Poverty Line	4.7	2.2	5.1
Non-food basic needs	27.2	`9.2	8.5

This contrasts with the baseline estimates for the MCA project baseline data of Efate 37.7% of households and 14.6% of households in the Santo catchment area.

It is worth noting the non-food basic needs are normally met in cash payments, therefore the Compact goal of increasing cash incomes is entirely consistent with reducing poverty. To provide the official baseline estimates for the MCA indicators the data will need to be re-analysed to obtain poverty incidence estimates for the islands of Efate and Santo. (see section 2.3).

5.1.2 Which poverty line to use?

The NSO has published its Poverty Report, and has used an absolute poverty line methodology; this is consistent with the normal practise in developing countries worldwide.

> *'While absolute poverty lines have dominated the practice of poverty measurement in developing countries, relative poverty lines are considered more relevant in several developed nations*[19]

In the interests of comparability and conforming to international norms and standards it would seem beneficial for Vanuatu to use the accepted absolute poverty line methodology (although had they had the imputed microdata from Dr. Alevy the results may have been of higher quality).

The MCC consultant Dr Alevy has calculated a relative poverty line, based on the values for each project area. The following is extracted from Dr. Alevy's report.

> *'The FPL was calculated independently for each project area as the mean expenditure for the 2,100 calories for households with per capita kilocalorie consumption in the range of plus or minus 10% of the threshold nutritional intake. For this group, all other expenses are considered non-food 'basic needs' and the total mean per capita expenditure for this group comprised the Basic Needs Poverty Lined (BNPL) for the project area'.*

There are now two estimates of poverty connected with this project – the official estimate using the ADB methodology, and that produced by the MCC in the USA. This is confusing for users and stakeholders and will be a continuing source of problems unless common ground can be found. In current the M & E Report, the Dr Alevy estimate has been used. Efate's poverty rate among households is given as 31.2%, while Santo's is 7.3%[20].

As the full methodology and resulting estimates have not been made fully available to the MCA (Vanuatu) or the NSO it is impossible to comment on their quality. Due to this I am not able to comment on the comparative soundness of the two poverty estimates as such, however I would comment that the method used by the NSO conforms to international and most importantly regional norms and standards for developing countries. It has the advantages of simplicity and transparency, the 'basket' of goods relates to a typical diet from that region, and can be updated and re-costed according to price movements. This allows the poverty line to be updated periodically and to be used as a policy instrument, and it therefore a more sustainable technique for the NSO to replicate in 2011.

This approach also helps politicians and policy makers unfamiliar with poverty concepts to understand what is meant by the term, as a relatively straightforward principle being used. It should be noted that poverty is a new statistical for local stakeholders to come to terms with.

It is desirable to use official statistical estimates wherever possible for monitoring purposes. This ensures that all partners are using the same data, and is consistent with the Paris Declaration Aid Effectiveness principles for donors to use strengthened country systems, it has already been noted that the MCA programme has achieved substantial progress in raising the capacity of the NSO in Vanuatu.

[19] Rio Group Expert Group on poverty statistics p. 73. also See Ravallion (1994: 37-42) and Sen (1983: 153-169).
[20] Incidentally poverty rates are more usually expressed as percentages of persons, although either can be used and the NSO/ADB report presents both.

> *"Using a country's own institutions and systems, where these provide assurance that aid will be used for agreed purposes, increases aid effectiveness by strengthening the partner country's sustainable capacity to develop, implement and account for its policies to its citizens and parliament. Country systems and procedures typically include, but are not restricted to, national arrangements and procedures for public financial management, accounting, auditing, procurement, results frameworks and monitoring[21]".*

5.1.3 Completing the poverty work on the HIES

The basic needs poverty line (BNPL) has been computed for households in Vanuatu according to three domains:

1. Port Vila 53,159
2. Luganville 26,883
3. Rural 14,809
4. Vanuatu average 21,692

The same method should be used to compute the poverty estimate for the MCA catchments. This will involve carrying out exactly the same procedures for the islands of Efate, and Espiritu Santo.

5.2 Number of tourism related jobs created: discussion of sources and alternative estimates

5.2.1 Tourist Business Survey

There are a number of potential sources of this information, but none are ideal for the purposes of monitoring this programme. The information for the programme monitoring was intended to have been taken from the tourism surveys, specifically the Tourism Business Survey undertaken by the Consultants. The first quality audit expressed some concerns about the potential quality of that data, and the opinions of the auditor have not changed.

The consultants contacted 350 businesses and obtained results from 103 (30% response rate). As the consultants' report mentioned it is not possible to 'gross-up' the responding units to account for the non-responding ones, as enterprises are of vastly different sizes and types. While the sample yielded some useful information about business operation and profitability, it is unsuitable for estimating total employment, due to its low precision. The 'extrapolation factor' used is particularly debatable and has been already discussed in section 2.4.1.

The estimates provided by Enterprise appear in the following table.

[21] Paris Declaration on Aid Effectiveness, High Level Forum Paris, February 28 – March 5 2005, OECD, Paris, para 17.

Table 5.4 Enterprise Survey estimates of tourism related employment

Employment	Hotels	Tour operation	Other transport	Retail	Other	TOTAL
Full-time	615	206	145	98	185	1249
Part-time	182	92	25	35	205	539
ALL	797	298	170	133	390	1788
Full-time	615	206	145	98	185	1249
FTE	61	31	8	12	68	180
TOTAL	724	241	153	110	255	1483

5.2.2 Dr. Jonathon Alevy

The MCC requested that Dr. Jonathon Alevy add some additional comments and calculations on tourist employment in the two catchment areas. He notes;

> *'One difficulty in extending the project impact zone beyond the rural catchment areas is that the tourism survey does not identify the locations of the firms with more specificity than the island on which they are located. In particular the urban/rural split cannot be observed. Estimates of the location of tourist employment is inferred from the HIES data (ADB 2008a) which suggests that 32% (68%) of tourism related employment is in the rural (urban) areas'*

He includes the table below which shows his estimate of the number of tourist jobs in Efate and Santo, based on an ADB estimate of tourism employment taken from the HIES. I do not have access to this document, but I see no good reason why the HIES could not be used to develop an estimate of tourism employment, and have carried out an analysis of the HIES data.

Table 5 Tourist Employment from the Alevy Report

Employment	EFATE	SANTO
Full Time	1009	140
Part-time	295	66
FTE	98	22
Expatriate	48	4
Survey Sample FTE	1155	166
Extrapolation Factor	**2.57**	**2.57**
Estimated Total FTE	2968	427

5.2.3 The Enterprise Survey estimates.

These estimates were the basis of the Alevy estimates – and have estimated the number from the sample by using the ratio of total tourist expenditure from their visitor surveys and the turnover of the businesses in the sample.

Table 14: Employment in the Businesses Sample by the Island

		EFATE	SANTO	MALEKULA	TANNA	OTHER	Total
Full Time		1009	140	2	68	30	1249
Part-time		295	66	5	25	148	539
FTE	3.0	98	22	2	8	49	180
Expatriate		48	4	0	0	2	54
Total FTE		1155	166	4	76	81	1483
	Breakdown	77.9%	11.2%	0.2%	5.1%	5.5%	100.0%
Part-time as % Full-time		29.2%	47.1%	250.0%	36.8%	493.3%	43.2%
Expatriate as % FTE		4.2%	2.4%	0.0%	0.0%	2.5%	3.6%

Source: Tourism Business Survey 2007/08

Another method of estimating employment is to take the sample statistics of 1483 FTEs and gross up by the ratio between Total Tourist Expenditure in Vanuatu (approx Vatu 18 billion) and the turnover in the sample (approx Vatu 7 billion). This gives a figure of approximately 3,800 full time equivalent employment generated by tourism spending. This method is considered to be suitable for the establishment of a Baseline figure on employment.

5.2.4 HIES Tourism Employment

The published HIES report does not include tables on tourism employment, but it is possible to derive some estimates using the data which was provided to the consultant by the NSO.

The HIES estimates some 93,000 persons were employed during the 30 day reference period. Of these 23,000 were paid employees of whom 6,000 were civil servants. This seems to fit reasonably well with the VNPF estimates of 20,538 of paid employment in 2006 quoted by the Consultants' report.

Table 5.5 Employment estimates from the HIES

HIES 2006 Work status	Type of work: pqfq3b				
	Work for pay or profit	Unpaid help in family business	Subsistence farmer	Other work unpaid	Total
Businessman	1,500	1200	100	100	3000
Civil Servant	6,000	100	0	0	6100
Private employee	12,600	600	500	300	1400
Subsistence farmer	200	600	6100	800	62400
Volunteer Community workman	500	200	200	500	1400
Pastor Work for the church	500		100	200	800
Other	1700	400	300	2700	5000
Total	23,000	3,100	62000	4600	93000

Source: HIES 2006

The HIES gives an estimate of around 1,800 inhabitants of Shefa employed in tourism related industries. In Santo the results indicate around 450.

These estimates are smaller than the grossed up figures from the Enterprise Survey, which are 2968 for Efate and 427 for Santo, even though all shop workers, bank clerks and drivers have been included. The Luganville and Port Vila estimates have an unweighted sample size of around 100 cases, which may be adequate for use. This estimate obtained from the HIES throws considerable doubt on the tourism enterprise survey numbers, which I consider to be of unsatisfactory quality.

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6 Evaluation component

6.1 Proposed methodology

The M & E Plan defines the sources of information which will be used to evaluate the programme in late 2010. These are as follows:

The role of transportation infrastructure on agricultural production and sales and development of businesses in the project areas will be based primarily on the:

- Roadside Enterprise Survey
- The NSO formal and informal sector survey
- The monitoring data (e.g. traffic volumes and tourism activity); and
- The Household Income and Expenditure Survey (2006 & 2011).

For the impact of the roads on the tourism economy (including income, tourism expenditures, and tourism employment levels), which will be based on the:

- Tourism Income and Expenditure Survey (2007 and 2010);
- Visitor arrival data; and
- Other tourism data, such as number of new hotel rooms, if available and considered reliable.

Impact of transport infrastructure on household income and poverty in Vanuatu, based on the:

- Household Income and Expenditure Survey (2006 & 2010).

The impact of transport infrastructure on access to schools, healthcare, and other social services, based on the:

- Interpretation of the results of the HIES (2006 & 2010);
- Possible ad-hoc surveys of villages in the catchment areas of the projects through stakeholder consultations; and
- stakeholder evaluation of vulnerable groups such as plantation workers, women's group, youth groups and the disabled.

6.2 Surveys

1. Accommodation Survey. It was originally intended that a routine monthly survey of a sample of hotel and bungalow accommodation would be done by the National Statistics Office (NSO) for major establishments in Port Vila, Santo, and Tanna.

Comment: This has proved to be impossible to collect reliably, and was abandoned in the M&E Plan revisions. If required a hotels census could be conducted by consultants in 2010 as a replacement to the tourist enterprise survey.

2. Household Income and Expenditure Survey (HIES). The HIES is conducted by the NSO, and was provide the basis for measuring the extent to which the Goal for the project of increasing formal personal income and reducing poverty is achieved. The survey will explicitly account for income from agricultural activities (as distinct from salaries/wages paid by employers) and will have a higher rate of sampling of project beneficiary groups to ensure statistical validity. The 2006

iteration of the survey provided baseline data. MCA-Vanuatu will fund and coordinate with NSO implementation of a follow-up survey in 2011, to measure end-of-compact and post-compact results.

Comment: This survey will be conducted and will report too late to provide results for the evaluation as currently planned.

3. Road-side Enterprise Survey. A special survey was conducted by MCA-Vanuatu in 2008 create a census of all businesses along the two project roads. The survey captured the type, size of business, gender of owner and time period in operation. It will be important to track business development along the roads, as the rise in the number of business establishments will provide a secondary indicator of the impact of the road projects on prompting commercial activity.

Comment: The response rates have been high and will provide useful and direct information on the growth of enterprises and employment along the two roads improved by the project. The changes may be more easily attributed to the MCA programme than the other indicator sources proposed. The survey will provide information on business development and direct beneficiaries of the project. Additional questions in the Formal and Informal Survey may add further value to this useful exercise.

4. National Formal and Informal Sector Surveys. To track business development at the end of the compact and compare with the ex-ante information captured in the Road-Side Enterprise Survey, MCA-Vanuatu will provide funds to the NSO to incorporate this information collection into their National Formal and Informal Sector Surveys in 2010. The entire sample of businesses along the two project roads will be included in the total samples of these surveys, and NSO will adjust the questionnaires to capture additional information relevant to tracking the impact of the compact.

Comment: This will prove to be a very useful source of information to verify tourism employment and the roadside enterprise survey. Care should be taken to utilise the same questions to avoid changing the responses and losing comparability. The response rate on the first enterprise survey was 100% and this response should not be jeopardised by overloading the questionnaire. If the tourist enterprise survey is to be replaced by a hotels census, then business turnover should be included.

5. Tourism Surveys and Expenditure Study. This survey, contracted by MCA-Vanuatu to a private firm, captures and estimates baseline and end-of-compact data on tourism expenditure, tourist behaviour pattern, tourism employment, and other impacts of the tourism industry on the Vanuatu national economy, such as contribution to GDP. The baseline survey was conducted in 2007, and the follow-up survey will be conducted in 2010 and 2011.

Comment: The tourism surveys provide a very useful estimate of the contribution of tourism to GDP. The target figure of international arrivals has already been met, and problems of attribution may arise. It should be noted that per capita air tourist expenditure has fallen since 2004. The enterprise survey is of very limited use in estimating tourist employment. The turnover figures may be useful, but may be more accurately collected by the NSO in its informal and formal enterprises survey. The consultants should focus instead on a hotels census of Efate and Santo, to replace the accommodation survey which has had to be abandoned. NSO is looking for better methods to collect hotel occupancy, but may still find reluctance among Vila hoteliers to cooperate. The good relationship between consultants and the hotel industry may encourage better response rates if they were to turn their attention to hotels rather than an unscientific sample of some tourism industries.

6. Traffic Count Surveys. MCA-Vanuatu and the PWD will work together to conduct baseline and follow-up traffic counts on the project roads, using automated traffic counters. This work also will include an Origin and Destination survey on a selected sample of vehicle. Surveys are undertaken for seven days at each location during different times of the year so that fluctuations in demand by day of week and time of year can be taken into account and to ensure statistical significance given the generally low levels of traffic. As there is little traffic at night, each survey will be undertaken for a 12 hour period. Follow up surveys will be conducted during the dry season of 2009 (May-September 2009), the wet season which should be late 2009 and early 2010 (December 2009 – March 2010) and the dry season of 2010 (May-September 2010) and the wet season which should be late 2010 and early 2011 (December 2010-March 2011).

Comment: The origin and destination surveys have proved to be very valuable when used in conjunction with each other. It would be useful to conduct the surveys during different seasons and in the presence and absence of cruise ships. The passenger surveys provide information on the beneficiaries of the programme, about who is using the road and for what reason. Not only can the volume of traffic be expected to rise, but the purpose to which the road is used will change. The users of the Efate and Santo roads are very different from one another; this will be a most useful tracking devise and provide direct evidence of the impact of the road improvements. MCA should conduct origin and destination surveys at least once more before the close of the programme, with the traffic counters.

7. Road Condition Survey. A survey of road conditions will be conducted to monitor change in road conditions, as well as performance of PWD. The survey will assess the condition of the road through a visual assessment of its condition and how fast it is possible to drive on the road under certain consistent conditions, holding other factors constant. The condition of the road will be measured on comfortable speed which will be subjective and depend on the age, type and condition of the vehicle and the attitudes of the driver and passenger. Baseline values have already been collected for the Efate and Santo roads. At least one follow-up will be conducted, and possibly more depending on the construction timeline. It should be noted that the approach for conducting this survey may be subject to change as the methodology and approach continues to be reviewed.

Comment: This survey may not be useful in the time remaining for the programme. The roads can be expected to be in good condition on completion and will take time to deteriorate.

6.3 The Evaluation

It is expected that the evaluation planned by the MCC for 2010 will be data hungry; it may be useful for the data quality auditor to time her visit to coincide with the evaluation. A 2010 evaluation will not be able to assess progress against the goal indicators, as the second HIES will not have been completed and the employment estimates from the tourism enterprise survey are not thought to be reliable.

A 2010 evaluation is likely to focus on the data which will have been collected by the MCA in respect of roadside enterprises, traffic surveys and the changes in the way that the roads are being used which will be extracted from the origin and destination surveys. A 2010 evaluation date will require that a traffic count and an origin and destination survey are completed. It will also use the official tourism data and the passenger survey data.

In making its decision about the coverage of roadside enterprises in the informal and external sectors the MCA should consider whether the results in this much larger scale survey will be available in time for the evaluation. It may be advisable to repeat the roadside enterprise survey later in 2010 to ensure that there are timely, comparable results for use in the evaluation.

On the other hand if the evaluation is not to be conducted until 2011, then the availability of census, formal and informal survey data and possibly the HIES would provide a richer data source to draw upon, however it is anticipated that there will be problems in attributing relatively small changes in income and poverty to the MCA programme. The roadside survey may in the end prove to be a more reliable source of data on income and employment generation.

List of Persons Met

Name	Designation	Agency
Johnson Wabiat	Director	MCA-Vanuatu
Tony Amos Sewen	Economic Analyst	MCA-Vanuatu
Chris Cookson	Resident Country Director	MCC Vanuatu
Allen Faerua	Director	Public Works Department
Simil Johnson	Acting Government Statistician	National Statistics Office
Pita Toa	Statistician	National Statistics Office
Benuel Lengue	Population Census Coordinator	National Statistics Office
Pioni Willie	Statistician	National Statistics Office
Anna Tavoa	Statistician	National Statistics Office
Leon Pietsch (by e-mail)	Statistician Technical Assistance	Independent Consultant
Richard Gaeta (telephone)	Monitoring and Evaluation	MCC Washington
Anne Reader (by e-mail)		Australian Bureau of Statistics

References/Bibliography

Alevy, Jonathon (2008) *Transport Infrastructure Evaluation Indicators for Port Olry Road, Santo & Round Island Road, Efate,* University of Nevada - Reno

Asian Development Bank (2003): *Priorities of the People : Hardship in Vanuatu,*January 2003

Deaton, Angus and Zaidi, Salman (2002); *Guidelines for Constructing Consumption Aggregates for Welfare Analysis LSMS Working Paper 135,* World Bank, Washington.

Government of Republic of Rwanda (2002): *A Profile of Poverty in Rwanda,* Ministry of Finance and Economic Planning, Kigali, Rwanda.

National Statistics Office (2004): *2004 Visitor Survey,* Port Vila, Vanuatu

National Statistics Office (2008): *Report on the Estimation of Basic Needs Poverty Lines, and the Incidence and Characteristics of Poverty in Vanuatu,* Port Vila, Vanuatu

TRIP Consultants: Tourism Survey Baseline Study – Final Report, June 2008

Expert Group on Poverty Statistics (2006) *Compendium of best practices in poverty measurement,* Rio Group, Rio de Janeiro, September 2006

Annex A Quality Checklists

A.1 Goal Indicator: Cash Income

Data Quality Review Checklist *per capita cash income*	
Name of Project	Vanuatu Transport Infrastructure Development Program
Data source(s)	Household Income and Expenditure Survey (HIES)
Agency and/or individual who provided the data (if applicable)	National Statistics Office
Year or period for which the data are being reported	2006
Date(s) of assessment	July 2009
Location(s) of assessment	Vanuatu MCA and NSO Office
Assessment team members	Mary Strode
If applicable, date and author(s) of previous independent assessment. (These should be attached to the final main report).	November 2007 – Mary Strode

1. VALIDITY—Do the data adequately represent performance?			
Goal Indicator 1: Cash Income	**Yes**	**No**	**Comments**
Definition			
➢ Is the indicator well defined? Is the definition sufficiently precise that a reader could reproduce the statistic with the same dataset?	❒	☒	No a more precise definition of catchment is required. Suggest using all population of Efate & Santo. Per capita is not defined –adult equivalents should not be used. Is it the mean of household per capita incomes or the sum of income/sum of persons? Should be the mean of individuals in households incomes, not total cash/total persons
➢ Is the indicator reported in an appropriate format?	❒	☒	Cash income is very variable – cash expenditure a better proxy as less prone to distortion by extreme values.
Measurement Error			
Sampling Error (only applies when the data source is a survey)			
➢ Were the questions in the survey/questionnaire clear, direct, easy to understand?	☒	❒	Yes clear, but compiled by means of a complex aggregate. Potential for some double counting between household and diary questionnaires. Some further cleaning has been done to eliminate this error. Care should be taken in the design of HIES 2 in eliminating potential duplication.
➢ If the instrument was self-reporting were adequate instructions provided?	❒	❒	Interviewer administered, but diary completed by households. Written instructions good – but low literacy rates in country, may have needed more interviewer callbacks
➢ Were response rates sufficiently large?	☒	❒	Overall – yes
➢ Has non-response rate been followed up?	☒	❒	Imputations have also been made in some cases. Unit non-response problematic in some cases.
Non Sampling Error			
➢ Is the data collection instrument well designed?	☒	❒	It accords with international standards – but questionnaires long and complex, and burden on respondents and interviewers high.
➢ Were there incentives for respondents to give incomplete or untruthful information?	❒	☒	They may have helped, but would set a precedent which would have implications for future surveys in the country.
➢ Are definitions for data to be collected operationally precise?	☒	❒	Yes but better metadata on the construction of aggregates needed
➢ Are enumerators well trained? How were they trained? Were they insiders or outsiders? Was there any quality control in the selection process?	❒	☒	Trained but one week probably insufficient for the complexity of the instruments administered. A point recognized by NSO in lessons learned discussions with auditor
➢ Were there efforts to reduce the potential for personal bias by enumerators?	☒	❒	Yes supervision and training. Bias generally unlikely. 85% response rate, but lower in Port Vila 69%.

Transcription Error			
➢ What is the data transcription process? Is there potential for error?	☒	❒	Editing and data cleaning carried out and supported by consultants from Australian Bureau of Statistics
➢ Are steps being taken to limit transcription error? (e.g., double keying of data for large surveys, electronic edit checking program to clean data, random checks of partner data entered by supervisors)	☒	❒	Electronic checking programmes used. Double data entry used. Field entry using handheld PCs would help reduce field errors in future. The largest problem was unit non-response.
➢ Have data errors been tracked to their original source and mistakes corrected?	☒	❒	Yes
➢ Do raw data need to be manipulated to produce the data required for the indicator?	☒	❒	Complex aggregates required
➢ Are the correct formula being applied?	☒	❒	
➢ Are the same formulae applied consistently from year to year, site to site, data source to data source (if data from multiple sources need to be aggregated)?	❒	❒	Non applicable – this is the first time the survey has been conducted.
➢ Have procedures for dealing with missing data been correctly applied?	☒	❒	Not always possible to see – but appears correct (checked on first visit)
➢ Are final numbers reported accurate? (E.g., does a number reported as a "total" actually add up?)	☒	❒	
Representativeness of Data			
➢ Does the sample from which the data are drawn correspond to the population served by the activity?	☒	❒	Yes, national coverage and catchment area can be defined.
➢ Did all units of the population have an equal chance of being selected for the sample?	☒	❒	PPS sampling, with a know chance of selection within strata and corrective weights were applied. Some areas excluded from outlying islands and very remote areas. These are not in project catchment areas.
➢ Is the sampling frame (i.e., the list of units in the target population) up to date? Comprehensive? Mutually exclusive (for geographic frames)	☒	❒	Yes, NSO frame used and EA maps official.
➢ Are the data complete? (i.e., have all data points been recorded?)	☒	❒	Yes

Recommendations for improvement:

- Recommend using cash expenditure – NSO to do for Efate and Santo (see report)
- Define catchment area as the entire island of Efate and entire island of Santo
- In future longer training of enumerators, and supervisors (2 weeks rather than 1).
- More field supervision required
- Eliminate double counting of cash income between diary and household questionnaire

2. RELIABILITY—Are data collection processes stable and consistent over time?			
	Yes	**No**	**Comments**
Consistency			
➢ Is a consistent data collection process used from year to year, location to location, data source to data source (if data come from different sources)?	❒	☒	First survey of its kind
➢ Is the same instrument used to collect data from year to year, location to location? If data come from different sources are the instruments similar enough that the reliability of the data are not compromised?	❒	☒	First survey of its kind – recommend that the same instruments are used
➢ Is the same sampling method used from year to year, location to location, data source to data source?	❒	☒	First survey of its kind – recommend panel survey approach for 2011 HIES to limit sampling errors
Internal quality control			
➢ Are there procedures to ensure that data are free of significant error and that bias is not introduced?	☒	❒	Yes, but better field supervision needed
➢ Are there procedures in place for periodic review of data collection, maintenance, and processing?	☒	❒	See above
➢ Do these procedures provide for periodic sampling and quality assessment of data?	❒	☒	More supervision in the field needed – handheld computers would help but are expensive
Transparency			
➢ Are data collection, cleaning, analysis, reporting, and quality assessment procedures documented in writing?	☒	❒	Yes, but these are not accessible to users in the form of clear metadata
➢ Are data problems at each level reported to the next level?	☒	❒	Yes, data collection and cleaning procedures follow standard practice
➢ Are data quality problems clearly described in final reports?	☒	❒	To some extent, and there is a good table on standard errors and the fitness for use of the data.

Recommendations for improvement:

- Full methodological report is recommended to ensure that the next survey uses exactly the same procedures.

3. TIMELINESS—Are data collected frequently and are they current?

	Yes	No	Comments
Frequency			
➢ Are data available on a frequent enough basis to inform program management decisions?	❒	☒	The next survey will be after the end of the Compact
➢ Is a regularized schedule of data collection in place to meet program management needs?	☒	❒	The population census and other surveys planned will mean that the HIES will be conducted after the completion of the compact. Earlier survey is unlikely to yield results showing change and would overburden the NSO
Currency			
➢ Are the data reported in a given timeframe the most current practically available?	☒	❒	The preliminary report was available in 2007 and the final report appeared recently (report is not dated). The next HIES should be produced more quickly due to better familiarity with the subject matter.
➢ Are data from within the policy period of interest? (i.e., are data from a point in time after intervention has begun? *If applicable*)	☒	❒	The survey was conducted prior to the start of the road projects.
➢ Are the data reported as soon as possible after collection?	☒	❒	The preliminary data appeared in 2007. the complexity of the survey, and the inexperience of the NSO in this field delayed the final report.
➢ Is the date of collection clearly identified in the report?	☒	❒	

Recommendations for improvement:

- Ensure metadata is fully written up and accessible to speed analysis of the 2011 HIES

4. PRECISION—Do the data have an acceptable margin of error?			
	Yes	**No**	**Comments**
➢ Is the margin of error less than the expected change being measured?	❒	☒	Unless a panel survey is conducted in 2011 the change being measured will be subject to 2 sets of sampling errors. Cash income RSE reported as 9% Vila, 12% Luganville, 7% Shefa and 17% Sanma. The expected change is 25%, at the 95% (RSE for each of 2 surveys) the confidence interval the change is smaller than the margin of error in Santo. A 25% increase is perhaps an optimistic prediction.
➢ Is the margin of error acceptable given the likely management decisions to be affected? (consider the consequences of the program or policy decisions based on the data)	❒	☒	See report
➢ Have targets been set for the acceptable margin of error?	❒	☒	Non-sampling error likely to be more significant than sampling error. The sampling error has been minimized to acceptable limits within the resources available.
➢ Has the margin of error been reported along with the data?	❒	☒	Yes in the quality section of the report.
➢ Would an increase in the degree of accuracy be more costly than the increased value of the information?	☒	❒	

Recommendations for improvement:

- Choose cash expenditure where RSE is smaller.
- RSE for cash purchases
  - Sanma 7.3
  - Shefa 10.26
  - Vila 9.66
  - Luganville 7.35
- RSE for cash income
  - Sanma 16.68
  - Shefa 8.55
  - Vila 9.32
  - Luganville 12.23

5. INTEGRITY—Are data are free of manipulation?			
	Yes	**No**	**Comments**
➢ Are mechanisms in place to reduce the possibility that data are manipulated for political or personal reasons?	☒	❒	Statistics Act and neutrality of NSO in respect for political processes
➢ Is there objectivity and independence in key data collection, management, and assessment procedures?	☒	❒	Standard NSO procedures have been followed
➢ Has there been independent review?	☒	❒	Several consultants from ABS and ADB have worked on and reviewed the data

Recommendations for improvement:

- None

6. Other — Do the data serve the reporting requirements of MCA/MCC?			
	Yes	**No**	**Comments**
Can the data be disaggregated by . . .			
➢ . . . Income level?	❒	☒	The variable in question is income.
➢ . . . Gender?	❒	☒	Data is collected at household level – only sex of head of household is possible. Collecting individual income data not possible except in the case of employment income.
➢ . . . Location?	☒	❒	Data significant at Provincial and Urban area level
➢ . . . Age?	❒	☒	Same reasons as gender.

Recommendations for improvement:

- None – further disaggregation is not realistic

For indicators for which no recent relevant data are available
If no recent relevant data are available for this indicator, why not? • It is collected by means of an expensive and national income and expenditure survey. In developing countries these surveys are rarely, if ever, collected at greater intervals greater than 5 years. This is for reasons of expense, capacity but largely because the variables of income and expenditure do not change year on year and collecting every 5 years is considered optimal by most countries.
What concrete actions are now being undertaken to collect and report this data as soon as possible? • Next survey is planned for 2011
On what date will data be reported? • Survey should be conducted in the same month as the 2006 HIES to avoid seasonality issues in comparing the results. If the survey were conducted between September and December 2011 then the results would be available late 2012. If it were brought forward to 2010 then the results would be available late 2011.

A.2 Goal Indicator: Poverty rate

Data Quality Review Checklist *Reduce Poverty Rate*	
Name of Project	Vanuatu Transport Infrastructure Development Program
Data source(s)	Household Income and Expenditure Survey (HIES)
Agency and/or individual who provided the data (if applicable)	National Statistics Office
Year or period for which the data are being reported	2006
Date(s) of assessment	July 2009
Location(s) of assessment	Vanuatu MCA and NSO Office
Assessment team members	Mary Strode
If applicable, date and author(s) of previous independent assessment. (These should be attached to the final main report).	November 2007 – Mary Strode

1. VALIDITY—Do the data adequately represent performance?			
Reduce Poverty Rate	**Yes**	**No**	**Comments**
Definition			
➢ Is the indicator well defined? Is the definition sufficiently precise that a reader could reproduce the statistic with the same dataset?	☒	❒	Now the NSO has published a poverty line the definition is well described. The full and complete metadata on compiling the poverty aggregate is not available yet, therefore the estimate is difficult to reproduce.
➢ Is the indicator reported in an appropriate format?	☒	❒	Yes – catchment should be clearly defined as the islands of Efate & Santo
Measurement Error			
Sampling Error (only applies when the data source is a survey)			See responses to Goal Indicator 1 where the same comments apply.
➢ Were the questions in the survey/questionnaire clear, direct, easy to understand?	☒	❒	
➢ If the instrument was self-reporting were adequate instructions provided?	☒	❒	Population has high illiteracy rates – depends on good explanations from interviewers.
➢ Were response rates sufficiently large?	☒	❒	See Goal Indicator 1. In addition the indicator is highly dependent on good diary completion, this was poor in some areas and not adequately supervised. See Quality Auditor's report trip 1.
➢ Has non-response rate been followed up?	☒	❒	Yes and imputations made.
Non Sampling Error			
➢ Is the data collection instrument well designed?	☒	❒	Accords with international norms
➢ Were there incentives for respondents to give incomplete or untruthful information?	❒	☒	
➢ Are definitions for data to be collected operationally precise?	☒	❒	
➢ Are enumerators well trained? How were they trained? Were they insiders or outsiders? Was there any quality control in the selection process?	❒	❒	Insufficient training (7 days) and field practice (1 day). This should be lengthened. Enumerators recruited by NSO.
➢ Were there efforts to reduce the potential for personal bias by enumerators?	☒	❒	
			See comments on Goal 1

Transcription Error			
➢ What is the data transcription process? Is there potential for error?	❒	☒	Next survey should include greater number of call-backs or diary supervisor. May be better to increase data collection costs and reduce sample size? Comments on incomplete data included in First Visit Report
➢ Are steps being taken to limit transcription error? (e.g., double keying of data for large surveys, electronic edit checking program to clean data, random checks of partner data entered by supervisors)	☒	❒	Yes – more edit checking of improbably low total consumption values needed.
➢ Have data errors been tracked to their original source and mistakes corrected?	☒	❒	
➢ Do raw data need to be manipulated to produce the data required for the indicator?	☒	❒	Consumption aggregates required computing, and procedures to estimate if household was above or below the BNPL.
➢ Are the correct formula being applied?	☒	❒	Procedures complex and very difficult to assess in the time available. Better metadata required as unable to replicate results in the many interconnected spreadsheets.
➢ Are the same formulae applied consistently from year to year, site to site, data source to data source (if data from multiple sources need to be aggregated)?	❒	☒	Not yet – the procedures used must be very carefully written up to ensure that exactly the same procedures are followed.
➢ Have procedures for dealing with missing data been correctly applied?	❒	❒	Unable to say from the information made available – likely to be correct as supported by ADB consultant and ABS.
➢ Are final numbers reported accurate? (E.g., does a number reported as a "total" actually add up?)	❒	❒	Not really applicable. Was unable to replicate poverty rate in the time available.
Representativeness of Data			
➢ Does the sample from which the data are drawn correspond to the population served by the activity?	☒	❒	
➢ Did all units of the population have an equal chance of being selected for the sample?	☒	❒	PPS sampling used – probabilities calculated and weights applied.
➢ Is the sampling frame (i.e., the list of units in the target population) up to date? Comprehensive? Mutually exclusive (for geographic frames)	☒	❒	NSO census based frame.
➢ Are the data complete? (i.e., have all data points been recorded?)	❒	☒	Unit and household non-response catered for by weights and imputations (methods described in final report of HIES)

Recommendations for improvement:

- Much better price collection required in future as unit values varied dramatically between island which make island comparisons difficult, however this has a very limited impact in the project catchment areas.
- Improvements relate to much better training and field supervision.
- Full metadata is urgently required and the poverty variable added to the database to enable others to replicate and cross-tabulate the results.
- I was unable to replicate the results from the data.
- The MCC should use the official poverty results published by the NSO on behalf of the government.
- In comparing the results of the 2006 and 2011 HIES it is recommended that a specialist consultant be contracted to support the NSO in tracking changes over time. This will be a significant piece of work 3-4 weeks of input will be required.

2. RELIABILITY—Are data collection processes stable and consistent over time?			
	Yes	**No**	**Comments**
Consistency			
➢ Is a consistent data collection process used from year to year, location to location, data source to data source (if data come from different sources)?	❒	☒	Because this is the first estimate of its kind. It is of great importance that future estimates use exactly the same procedure as poverty estimates are very sensitive to method.
➢ Is the same instrument used to collect data from year to year, location to location? If data come from different sources are the instruments similar enough that the reliability of the data are not compromised?	❒	☒	Not yet applicable – see above
➢ Is the same sampling method used from year to year, location to location, data source to data source?	❒	❒	Not yet applicable – same sampling method or panel survey recommended to reduce sampling errors for comparing the results of the 2006 and 2011 surveys.
Internal quality control			
➢ Are there procedures to ensure that data are free of significant error and that bias is not introduced?	☒	❒	Yes editing programmes in place – but see comments on outliers in the consumption aggregate and impossibly low values.
➢ Are there procedures in place for periodic review of data collection, maintenance, and processing?	❒	❒	Not applicable – only one survey conducted.
➢ Do these procedures provide for periodic sampling and quality assessment of data?	❒	☒	Not really applicable – survey conducted once only.
Transparency			
➢ Are data collection, cleaning, analysis, reporting, and quality assessment procedures documented in writing?	☒	❒	They are documented – but in several places and the procedures are difficult to follow.
➢ Are data problems at each level reported to the next level?	☒	❒	During fieldwork chain of command from enumerator to supervisor to NSO in place
➢ Are data quality problems clearly described in final reports?	❒	☒	No, only partially described in internal documents

Recommendations for improvement:

- The next survey should be conducted using the same methodology – except where it is necessary to change procedures to reduce error, non-response or other non-sampling errors. A panel survey is recommended.
- A full methodological report outlining the procedures used to clean and edit the data and documenting the data errors is advisable.
- The NSO should work with the ADB consultant to produce full metadata for the poverty estimation.
- The poverty rates for the islands of Efate and Espiritu Santo should be computed

3. TIMELINESS—Are data collected frequently and are they current?

	Yes	No	Comments
Frequency			
➢ Are data available on a frequent enough basis to inform program management decisions?	❒	☒	The HIES will be conducted on a 5-yearly schedule – this will be too late to inform the final evaluation of this first compact. On the other hand an earlier survey is not recommended as the variable in question are likely to change slowly and an earlier survey would not yield useful results.
➢ Is a regularized schedule of data collection in place to meet program management needs?	☒	❒	Yes but results will be available well beyond the close of this compact. See report for alternative suggestions
Currency			
➢ Are the data reported in a given timeframe the most current practically available?	❒	☒	The M&E Plan should use the official results rather than those calculated by Dr. Alevy
➢ Are data from within the policy period of interest? (i.e., are data from a point in time after intervention has begun? *If applicable*)	☒	❒	Yes they date from 2006 – prior to start of project works
➢ Are the data reported as soon as possible after collection?	☒	❒	Yes but reporting process slow, due to the complexity of the topic and because the NSO required several inputs of international support to clean the data and compute the estimate
➢ Is the date of collection clearly identified in the report?	☒	❒	Yes September to December 2006

Recommendations for improvement:

- Fully document metadata to enable analytical and computational procedures to be carried out quickly, efficiently and following the same procedures as in 2006.
- Compute poverty lines using the official method for the islands of Santo and Efate
- Use an intermediate indicator for a goal indicator substitute for the final evalauation

4. PRECISION—Do the data have an acceptable margin of error?			
	Yes	**No**	**Comments**
➢ Is the margin of error less than the expected change being measured?	❒	☒	Likely to be so – the sampling errors have not been computed for the poverty line, but these change remarkably slowly.
➢ Is the margin of error acceptable given the likely management decisions to be affected? (consider the consequences of the program or policy decisions based on the data)	☒	❒	Poverty has to be measured, but it should be supported by other indicators
➢ Have targets been set for the acceptable margin of error?	❒	☒	
➢ Has the margin of error been reported along with the data?	❒	☒	The sampling error complex and will need specialist support.
➢ Would an increase in the degree of accuracy be more costly than the increased value of the information?	☒	❒	

Recommendations for improvement:

- Poverty tends to show small increases over relatively long periods of time. As the first project has not yet been completed, it is unlikely to show any improvement by the time of the next evaluation.
- The official poverty lines and rates should be used by the MCA – and this will be consistent with rates used by other partners and the government.
- Sampling errors have not been calculated – and rates of poverty still need to be calculated for the two islands which form the catchment area. NSO and the ADB consultant should calculate the poverty rates for the two islands, and if possible estimate a sampling error.
- The expected change in poverty for the islands looks improbable.

5. INTEGRITY—Are data are free of manipulation?			
	Yes	**No**	**Comments**
➢ Are mechanisms in place to reduce the possibility that data are manipulated for political or personal reasons?	☒	❒	Several independent consultants have worked on this data.
➢ Is there objectivity and independence in key data collection, management, and assessment procedures?	☒	❒	Yes
➢ Has there been independent review?	☒	❒	Yes – self and several other consultants

Recommendations for improvement:
None

6. Other — Do the data serve the reporting requirements of MCA/MCC?			
	Yes	**No**	**Comments**
Can the data be disaggregated by . . .			
➢ . . . Income level?	☒	❒	
➢ . . . Gender?	❒	☒	Poverty is assessed at the household level. Number of females living in poor households, or poor female headed households can be reported on.
➢ . . . Location?	☒	❒	
➢ . . . Age?	❒	☒	Poverty is assessed at the household level. Number of person living in poor households by age group, or poor households by age of head can be reported on.
Recommendations for improvement: None			

For indicators for which no recent relevant data are available
If no recent relevant data are available for this indicator, why not? No further collection was planned until 2011
What concrete actions are now being undertaken to collect and report this data as soon as possible? Earlier collection not recommended – unlikely to yield useful results
On what date will data be reported? Recommend use of roadside survey data as intermediate outcome indicator – see report

A.3 Goal Indicator: Tourism Employment

Data Quality Review Checklist Increase Tourism Employment	
Name of Project	Vanuatu Transport Infrastructure Development Program
Data source(s)	Household Income and Expenditure Survey (HIES)
Agency and/or individual who provided the data (if applicable)	National Statistics Office
Year or period for which the data are being reported	2006
Date(s) of assessment	July 2009
Location(s) of assessment	Vanuatu MCA and NSO Office
Assessment team members	Mary Strode
If applicable, date and author(s) of previous independent assessment. (These should be attached to the final main report).	November 2007 – Mary Strode

1. VALIDITY—Do the data adequately represent performance?			
	Yes	**No**	**Comments**
Definition			
➢ Is the indicator well defined? Is the definition sufficiently precise that a reader could reproduce the statistic with the same dataset?	❒	☒	No the term tourist related job is not well defined and it is unclear as to whether this refers simply to employees or to other categories of worker, e.g proprietors, unpaid family workers etc.
➢ Is the indicator reported in an appropriate format?	❒	☒	No a spurious level of precision is used.
Measurement Error			
Sampling Error (only applies when the data source is a survey)			
➢ Were the questions in the survey/questionnaire clear, direct, easy to understand?	☒	❒	It was clear but insufficient precision in the questioning
➢ If the instrument was self-reporting were adequate instructions provided?	❒	❒	Not know – questionnaire is not available
➢ Were response rates sufficiently large?	❒	☒	Response rate of 25% only
➢ Has non-response rate been followed up?	☒	❒	Yes, only 100 responses were asked for
Non Sampling Error			
➢ Is the data collection instrument well designed?	❒	☒	Insufficient precision on employment categories and restricted categories of workers used.
➢ Were there incentives for respondents to give incomplete or untruthful information?	❒	☒	No incentive to collaborate
➢ Are definitions for data to be collected operationally precise?	❒	☒	Not known
➢ Are enumerators well trained? How were they trained? Were they insiders or outsiders? Was there any quality control in the selection process?	❒	❒	Self completion questionnaire
➢ Were there efforts to reduce the potential for personal bias by enumerators?	❒	❒	Not applicable – self completion
Transcription Error			
➢ What is the data transcription process? Is there potential for error?	❒	☒	Not know
➢ Are steps being taken to limit transcription error? (e.g., double keying of data for large surveys, electronic edit checking program to clean data, random checks of partner data entered by supervisors)	☒	❒	Double entry is not reported, but edit checks and outliers were checked
➢ Have data errors been tracked to their original source and mistakes corrected?	☒	❒	Yes
➢ Do raw data need to be manipulated to produce the data required for the indicator?	☒	❒	Estimates are made of total employment from grouped employment categories – the process was not described in the report. The survey figures are grossed up to estimate total

			employment in tourism.
➢ Are the correct formula being applied?	❒	☒	Use of turnover from the visitor survey is used, but is not adequate. Process of estimating employment and full-time equivalents in not adequately described.
➢ Are the same formulae applied consistently from year to year, site to site, data source to data source (if data from multiple sources need to be aggregated)?	❒	❒	First survey of its kind
➢ Have procedures for dealing with missing data been correctly applied?	❒	☒	Non-response not adequately dealt with in business survey
➢ Are final numbers reported accurate? (E.g., does a number reported as a "total" actually add up?)	☒	❒	Spurious precision to the last digit
Representativeness of Data			
➢ Does the sample from which the data are drawn correspond to the population served by the activity?	❒	☒	List obtained from Tourism Office, and added to by the consultants in a process which is not well described in the report.
➢ Did all units of the population have an equal chance of being selected for the sample?	❒	☒	No – some shops were selected and others not (e.g. one particular supermarket and all duty free shops)
➢ Is the sampling frame (i.e., the list of units in the target population) up to date? Comprehensive? Mutually exclusive (for geographic frames)	❒	❒	Not know –list from the Tourism Office not seen on this trip.
➢ Are the data complete? (i.e., have all data points been recorded?)	❒	❒	Not known

Recommendations for improvement:

- If this is to be repeated in its current form then the list of establishments should be provided by the NSO, and preferably be drawn from the informal and formal sector survey. This will cause problems in comparability.
- Better questionnaire design which includes actual employment, including proprietors, employees and unpaid family workers.
- Better metadata on the computation of the estimates of employment.
- Grossing-up procedures to be reviewed and carried out according to improved register of establishments.
- If this is not possible then a different approach should be found.

2. RELIABILITY—Are data collection processes stable and consistent over time?			
	Yes	**No**	**Comments**
Consistency			
➢ Is a consistent data collection process used from year to year, location to location, data source to data source (if data come from different sources)?	❒	☒	Not collected annually – first survey of its kind.
➢ Is the same instrument used to collect data from year to year, location to location? If data come from different sources are the instruments similar enough that the reliability of the data are not compromised?	❒	☒	As above
➢ Is the same sampling method used from year to year, location to location, data source to data source?	❒	☒	As above
Internal quality control			
➢ Are there procedures to ensure that data are free of significant error and that bias is not introduced?	☒	❒	Data editing processes described
➢ Are there procedures in place for periodic review of data collection, maintenance, and processing?	❒	❒	Not known
➢ Do these procedures provide for periodic sampling and quality assessment of data?	❒	❒	Not known
Transparency			
➢ Are data collection, cleaning, analysis, reporting, and quality assessment procedures documented in writing?	☒	❒	Partially – but very inadequately described
➢ Are data problems at each level reported to the next level?	❒	❒	Not known
➢ Are data quality problems clearly described in final reports?	❒	☒	No

Recommendations for improvement:

- Full methodological report required.

3. TIMELINESS—Are data collected frequently and are they current?

	Yes	No	Comments
Frequency			
➢ Are data available on a frequent enough basis to inform program management decisions?	☒	❒	Two surveys are planned for 2006 and 2010. This would be adequate if data quality was adequate.
➢ Is a regularized schedule of data collection in place to meet program management needs?	☒	❒	As above
Currency			
➢ Are the data reported in a given timeframe the most current practically available?	☒	❒	Data collection was carried out between September 2007 and February 2008, the final report was made available in June 2008.
➢ Are data from within the policy period of interest? (i.e., are data from a point in time after intervention has begun? *If applicable*)	☒	❒	
➢ Are the data reported as soon as possible after collection?	☒	❒	
➢ Is the date of collection clearly identified in the report?	☒	❒	

Recommendations for improvement:

None

4. PRECISION—Do the data have an acceptable margin of error?			
	Yes	**No**	**Comments**
➢ Is the margin of error less than the expected change being measured?	❒	☒	No confidence intervals can be calculated. The results do not match similar estimates from other sources.
➢ Is the margin of error acceptable given the likely management decisions to be affected? (consider the consequences of the program or policy decisions based on the data)	❒	☒	The target is within the error range – no significant change seems to be anticipated in the M & E Plan
➢ Have targets been set for the acceptable margin of error?	❒	☒	
➢ Has the margin of error been reported along with the data?	❒	☒	Sample not random and no margin of error can be given.
➢ Would an increase in the degree of accuracy be more costly than the increased value of the information?	☒	❒	Methodology is inadequate.

Recommendations for improvement:

➢ Recommend the roadside enterprise surveys are used as an alternative sources, supported by data from the HIES and the population census.

5. INTEGRITY—Are data are free of manipulation?			
	Yes	**No**	**Comments**
➢ Are mechanisms in place to reduce the possibility that data are manipulated for political or personal reasons?	❒	☒	The data are available to the NSO, but the interpretation in the report may be biased. Stakeholders report lack of confidence in neutrality.
➢ Is there objectivity and independence in key data collection, management, and assessment procedures?	❒	☒	As above
➢ Has there been independent review?	❒	☒	

Recommendations for improvement:

- Use a different data source

6. Other — Do the data serve the reporting requirements of MCA/MCC?			
	Yes	**No**	**Comments**
Can the data be disaggregated by . . .			
➢ . . . Income level?	❒	☒	Data collected at the enterprise level
➢ . . . Gender?	❒	☒	Data collected at the enterprise level
➢ . . . Location?	☒	❒	Data collected at the enterprise level and island is available
➢ . . . Age?	❒	☒	Data collected at the enterprise level
Recommendations for improvement: • HIES is capable of disaggregation by the above variables			

For indicators for which no recent relevant data are available
If no recent relevant data are available for this indicator, why not? **Two collections only are planned**
What concrete actions are now being undertaken to collect and report this data as soon as possible? **Enterprise survey could be a more regular source, but only two are planned.**
On what date will data be reported? **2010**

Annex B Terms of reference

DESCRIPTION OF SERVICES

1. BACKGROUND

The Government of the Republic of Vanuatu has received a grant from the Government of the United States of America through the Millennium Challenge Corporation (MCC) to support a five-year Program of investments in the Transport Sector, aimed at facilitating poverty reduction through economic growth. Vanuatu is now beginning the implementation phase, including set-up of performance monitoring and data collection. The Program, which was developed by the country through a consultative process, is designed to reduce poverty through infrastructure development to enable farmers in rural areas to get their produce to the markets and to foster development of the tourism industry.

The Government of Vanuatu has established an MCA-Vanuatu Unit within the Ministry of Finance and Economic Management to work full-time on implementing and managing the Program. Given that the Compact and supplemental agreements have been signed, MCA-Vanuatu has now become a Project Management Unit charged with the responsibility of managing and implementing the Program. The Compact and other supplemental agreements can be viewed on the MCA-Vanuatu's website http://www.governmentofvanuatu.gov.vu

The Project Management Unit is governed by the Compact and other Supplemental Agreements. One of the main responsibilities of the Unit is to monitor and evaluate the progress of the program, as outlined in the Monitoring and Evaluation Plan. Given the amount of data to be collected and reported on, a Consultant is required to regularly assess the monitoring work. The Consultant's main task is to review all program data for quality and reliability. The Consultant shall also provide support and advice to MCA-Vanuatu on developing a data quality manual, a management information system, planning and overseeing surveys, and other data quality issues.

2. OBJECTIVE OF THE ASSIGNMENT

The main objective of this consultancy is to ensure that data collected for program monitoring and evaluation is of acceptable quality, reliability, and consistency. The consultant shall carry out three reviews and provide quality assurance for surveys and other data collection initiatives. The Consultant is to review the data gathered for the program in three separate inputs, to ensure that data reported are valid, reliable, timely, and precise as resources allow. This is to verify the quality and consistency of data across different implementing entities and reporting institutions. The data quality reviews will also assist in identifying key issues or problematic areas regarding data quality and identifying mitigation measures to correct the problems. The Consultant shall review the following, but not limited to:

- the methodology in which the data are collected;
- the accuracy of analysis to determine computed indicators;
- the flow of data from the various institutions to MCA-Vanuatu;
- the accuracy, consistency, and reliability of primary and secondary data;
- data warehousing;
- survey quality and accuracy; and
- review methodology and accuracy of reporting to both MCA-Vanuatu by implementing institutions and reporting from MCA-Vanuatu to MCC.
-

3. METHODOLOGY AND SCOPE OF WORK

3.1 Content of Data Quality Audits and Analysis of Indicators

The Consultant shall carry out an analysis of the indicators and data yield that should include, but not be limited, to:

- Reviewing the data collection methods for the indicators, in addition to the data itself
- Ensuring that all data meets the standard required by MCC throughout the program;
- Identifying data weaknesses and proposing strategies for remedial measures;

- Flagging indicators that may be too weak, or have become inappropriate or irrelevant, and should be removed from program monitoring.
- Identifying replacement indicators and data collection methods that might supplant those that need to be removed.

3.2 Methodology

The Consultant will be based primarily in Port Vila. The Consultant shall review all data collected and relevant monitoring documents, make random site visits when required, and conduct interviews with relevant stakeholders. It is anticipated that the Consultant will engage in sufficient field visits to program activities and site visits to the sources of secondary data to observe and verify, through a methodology to be described below, how data are actually collected and calculated.

In order for the Consultant to perform the tasks thoroughly, he or she will need to work closely with MCA-Vanuatu, MCC, the National Statistics Office (NSO) and other institutions that are involved in data collection. Timing of proposed inputs need to agreed in advance as agencies such as the NSO have other responsibilities to manage. Reviews should include the following, but not be limited to:

i. Data mining - searching databases, registers, personal files, expert informants, agencies as well as conducting interviews;
ii. Site visits to the sources of data to observe and verify indicator accuracy, reliability, and consistency;
iii. Analysis on a sample of data to verify the outcome of the indicators;
iv. Identification of weaknesses in the data as well as in the mechanisms used in the data collection; and
v. Recommending remedial measures to address any weaknesses and assist in the implementation of the recommendations.

3.3. Key Tasks

The Consultant shall execute the following tasks:
Task 1: Carry out data quality reviews.
Specifically:

- Provide a Quality Auditing Plan (QAP) during the first assignment applicable for each review stating methods, frequencies, etc, during the initial phase of the contract.
- Conduct reviews of the quality of data gathered as mandated by the M&E plan to ensure that data reported are valid, reliable, consistent, and timely.
- Verify the quality and consistency of data across different implementing entities and reporting institutions through spot checks, detailed review of database content, and other techniques.
- Identify key issues and concerns regarding data quality.
- Identify strategies and recommendations for improving data quality and addressing any concerns raised during an audit.
- Make additional recommendations for modification of the monitoring and evaluation plan and data collection procedures, if necessary, to address any systemic data quality issues identified.
- Provide assistance to MCA-Vanuatu, if necessary, in implementing any recommendations.

Task 2: Provide advice and support to MCA-Vanuatu on its Database setup..
Specifically:

- Provide input and comments to MCA-Vanuatu about the content and structure of the Database to ensure that the system adequately addresses data quality and control issues.
-

Task 3: Carry out technical assistance and training related to data quality.
Specifically:

- Provide technical capacity building and training to MCA-Vanuatu to carry out interim data quality reviews and spot checks in between the data quality audits. In particular, the auditor shall develop written guidelines that will assist MCA-Vanuatu in carrying out ongoing data quality reviews.
- Provide technical assistance to the National Statistics Office to improve its data quality and

develop data quality procedures and guidelines for its own data quality audits

- Provide data quality orientation and training to all institutions that will be responsible for the collection and reporting of data

Task 4: Provide advice and support to MCA-Vanuatu on survey documentation and oversight.
Specifically:

- Assist with the development of survey documentation for all baseline and follow-up surveys.
- Provide technical advice and assistance as necessary to address data quality issues during survey implementation and dataset preparation.

4. DELIVERABLES

The Consultant shall be responsible for submitting the following deliverables. All deliverables must be submitted in English, and in both hard-copy and electronic form, unless otherwise agreed to with MCA-Vanuatu. Deliverables will be submitted according to a timeline agreed to by the Consultant and MCA-Vanuatu at the start of the Contract. MCA-Vanuatu will have one (1) week to review the deliverable and notify the Consultant of any questions or concerns, and the Consultant will then make any necessary revisions. The Consultant will provide to MCA-Vanuatu and MCC the Final Report or deliverable no later than two (2) weeks after the clarification meeting occurs, as outlined below. The deliverables are as follows:

(i). During the initial stage of the contract the Consultant is expected to provide a Quality Auditing Plan. This is expected to be done prior to proceeding with the first review. This document will serve as the baseline to the guidelines for MCA-Vanuatu interim reviews.

(ii). At the conclusion of each input, the Consultant shall make an oral presentation to MCA-Vanuatu, MCC-Vanuatu and key implementing entities. In the presentation the Consultant will include a description of the methodological approach taken and persons interviewed and any changes that may have been made during the engagement, and a description of the findings, conclusions and recommendations;

(iii). Following its initial review at the start of the program of all indicators, data collection methods, and reporting procedures, the Consultant will provide a preliminary written report to MCA-Vanuatu. The Preliminary Report will include, but not be limited to, a description of the methodological approach taken and persons interviewed. The report should include a description of findings, conclusions and recommendations for moving forward. The report should be provided in both hard and soft copy to MCA-Vanuatu.

(iv). Once MCA-Vanuatu receives the preliminary report it will carry out such analysis and discussions on the Consultant's recommendations and will communicate any comments on the recommendations requiring modification and/or issues requiring further clarification to the Consultant. Based on those discussions, the Consultant will provide the final report and assist MCA-Vanuatu in prioritizing the recommendations and developing strategies to be implemented by MCA-Vanuatu to address the issues that arise during the engagement.

(v). Provide three audit reports following each input, which should include the content outlined in item (iii) above. Audit reports will be submitted according to a timeline agreed upon between the Consultant and MCA-Vanuatu at the start of the contract. The reports should include the methodology, findings, conclusions and recommendations.

(vi). Provide written report summarizing input and comments provided in development of the database and management information system.

(vii). The Consultant shall deliver to MCA-Vanuatu written guidelines for spot checks and data quality reviews to assist MCA-Vanuatu in conducting quarterly reviews.

(viii). Provide the National Statistics Office written guidelines for improving that office's data quality.

Annex C Roadside enterprise survey

Comment [t1]: Survey methodology describe in annex e should be moved here.

C.1 Tabulations

C.1.1 Gender of business owner by island

Gender of Business Owner * Island Crosstabulation

Count

		Island		
		Efate	Santo	Total
Gender of Business Owner	Community	11	4	15
	Company	2	2	4
	Family	0	1	1
	Female	62	19	81
	Male	179	79	258
	School	0	1	1
	Total	254	106	360

Gender of Business Owner * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Gender of Business Owner	Community	4.3%	3.8%	4.2%
	Company	.8%	1.9%	1.1%
	Family		.9%	.3%
	Female	24.4%	17.9%	22.5%
	Male	70.5%	74.5%	71.7%
	School		.9%	.3%
	Total	100.0%	100.0%	100.0%

C.1.2 Industry of business by island

Type of Business * Island Crosstabulation

Count

		Island		
		Efate	Santo	Total
Type of Business	Agriculture Production	5	4	9
	Bakery	28	8	36
	Hotel, Bungalow & Resort	4	2	6
	Kava Bar	23	10	33
	Open Air Vendor	21	1	22
	Other	9	4	13
	Restaurant & Café	7	1	8
	Retail Trade	104	53	157
	Sawmill	2	7	9
	Tailor	8	0	8
	Tour	9	3	12
	Transport	34	13	47
	Total	254	106	360

Type of Business * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Type of Business	Agriculture Production	2.0%	3.8%	2.5%
	Bakery	11.0%	7.5%	10.0%
	Hotel, Bungalow & Resort	1.6%	1.9%	1.7%
	Kava Bar	9.1%	9.4%	9.2%
	Open Air Vendor	8.3%	.9%	6.1%
	Other	3.5%	3.8%	3.6%
	Restaurant & Café	2.8%	.9%	2.2%
	Retail Trade	40.9%	50.0%	43.6%
	Sawmill	.8%	6.6%	2.5%
	Tailor	3.1%		2.2%
	Tour	3.5%	2.8%	3.3%
	Transport	13.4%	12.3%	13.1%
	Total	100.0%	100.0%	100.0%

C.1.3 Length of operation of business

Years Operating * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Years Operating	1 year and under	19.2%	13.1%	17.3%
	2 to 5 years	42.4%	39.4%	41.5%
	6 to 10 years	18.8%	29.3%	22.0%
	11 to 15 years	6.2%	8.1%	6.8%
	16 to 20 years	6.2%	4.0%	5.6%
	Over 20 years	7.1%	6.1%	6.8%
	Total	100.0%	100.0%	100.0%

Table 1

		Island		
		Efate	Santo	Total
		Length of time in business	Length of time in business	Length of time in business
		Mean	Mean	Mean
Type of Business	Agriculture Production	14	18	16
	Bakery	6	6	6
	Hotel, Bungalow & Resort	3	2	2
	Kava Bar	5	4	5
	Open Air Vendor	5	7	5
	Other	9	2	7
	Restaurant & Café	8	2	7
	Retail Trade	6	7	6
	Sawmill	6	2	3
	Tailor	12	.	12
	Tour	14	11	14
	Transport	7	8	7
	Total	7	7	7

C.1.4 Type of employment

Table 1

	Island	
	Efate	Santo
	Sum	Sum
Number of Full time Employee	147	90
Number of Part time Employee	70	72
Number of Family Employee	255	138

Annex D Tourism Official Estimates

D.1

D.1.1 Tourism Statistics

NUMBER OF VISITOR (NON-RESIDENTS) ARRIVALS BY PURPOSE OF VISIT

Year	Holidays	Visiting Friends or Relatives	Business, Meetings, & Conference	Stop Over	Other Purposes	Not Stated	Total
1995	31,340	3,209	6,390	737	747	1,298	43,721
1996	33,652	2,944	5,833	937	891	1,866	46,123
1997	36,194	3,449	5,992	1,276	1,272	1,441	49,624
1998	36,441	3,076	6,081	699	1,094	1,694	52,085
1999	37,725	4,262	5,649	1,800	722	588	50,746
2000	44,992	3,486	5,857	1,109	1,083	1,063	57,591
2001	41,612	3,691	6,586	1,145	111	155	53,300
2002	38,740	3,563	6,544	611	1	3	49,462
2003	38,924	3,887	6,746	835	6	2	50,400
2004	47,516	4,662	7,741	1,534	0	0	61,453
2005	47,897	4,464	8,409	1,324	29	0	62,123
2006	53,030	5,061	9,312	775	1	0	68,179*
2007	63,325	6,162	10,838	1,021	-	-	81,345
2008	70,313	9,784	9,965	594	-	-	90,657

Source: Department of immigration

Note: * International visitor arrivals and departures to Luganville commenced in November 2006

Source: VNSO website http://www.spc.int/prism/country/VU/stats/TOURISM/tourism-purpose.htm

Annex E Passenger Survey Results

E.1 Methodology

The survey covers 2kms on either side of the road in both islands. Anything that is outside the 2km is not included, so on Efate 370km2 (4kmx92.5km) was covered; and 120 km2 was covered on Santo.

Before conducting the survey listings of all the businesses were obtained from the Shefa Provincial Government for Efate; and from Sanma Provincial Government for all businesses on the Santo East Coast Road. The list of business licences was used to cross check the businesses in each village. It should be noted that businesses that did not have a business license were also covered. Businesses that do not have a business license either operate illegally or were in operation after the close of paying business licenses. It was observed that most businesses on Efate had not paid for business licenses, whereas on Santo almost all the businesses had a licence.

The survey was carried out as a census or business inventory along the road, therefore all businesses were covered. Beforehand, notices and announcements were broadcast on the radio about the forthcoming business census. There were no non-responses to the enumerators and all the businesses responded to the questions.

There were two enumerators used on each island, so there are four enumerators in all. The enumerators were selected from previous enumerators from NSO who participated in the HIES. The MCA Economist personally supervised the census by traveling along the road to visit all villages and households along the road to check for operating businesses and to cross check with the list of business licenses list from the provincial government.

Comment [t2]: I think this relates to the road-side enterprise survey and not the passenger survey. There should in annex C.

E.2 Tabulations

Type of vehicle * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Type of vehicle	Bicycle	10.5%	.8%	5.2%
	Motor cycle	2.0%	1.0%	1.4%
	Car	7.6%	33.8%	21.8%
	Pick-up truck	43.6%	49.1%	46.6%
	Minibus	4.9%	.8%	2.7%
	Bus	25.6%	10.9%	17.6%
	Trailor and vehicle	2.7%	.2%	1.3%
	Other	3.3%	3.3%	3.3%
	Total	100.0%	100.0%	100.0%

Owner of vehicle * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Owner of vehicle	Driver	35.1%	43.2%	39.5%
	Driver's household	13.2%	13.6%	13.4%
	Driver's employer	16.9%	38.0%	28.4%
	Friend/ relative	16.9%	4.0%	9.9%
	Hire company	17.8%	1.2%	8.8%
	Total	100.0%	100.0%	100.0%

Used for business * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Used for business	Yes	69.2%	84.0%	77.2%
	No	30.8%	16.0%	22.8%
	Total	100.0%	100.0%	100.0%

Type of business * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Type of business	Household business	34.4%	8.2%	19.0%
	Enterprise with premises	21.4%	4.7%	11.5%
	Government/NGO	9.5%	5.0%	6.8%
	Public transport	34.6%	82.1%	62.6%
	Total	100.0%	100.0%	100.0%

Activity of business * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Activity of business	Farming or fishing	5.4%	2.2%	3.5%
	Public transport	43.6%	82.0%	66.4%
	Construction	6.9%	.5%	3.1%
	Trade	1.1%	1.8%	1.5%
	Tourism	14.7%	.4%	6.2%
	Government/ NGO	17.1%	4.6%	9.7%
	Other	11.2%	8.5%	9.6%
	Total	100.0%	100.0%	100.0%

Kilometres travelled last week * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Kilometres travelled last week	Zero	7.7%	28.5%	19.0%
	1 - 20	28.3%	15.6%	21.4%
	21 - 50	9.2%	12.3%	10.9%
	51 - 100	5.4%	5.9%	5.7%
	101 - 150	9.3%	1.2%	4.9%
	151 - 200	7.4%	11.5%	9.6%
	201 - 300	4.8%	5.3%	5.1%
	300+ km	27.9%	19.7%	23.4%
	Total	100.0%	100.0%	100.0%

Purpose of trip * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Purpose of trip	Pleasure	17.1%	2.0%	8.9%
	Work/ school	18.1%	58.9%	40.3%
	Shopping	5.9%	3.6%	4.7%
	Goods to market	6.8%	2.8%	4.6%
	Business	38.0%	25.4%	31.1%
	Social/ private	14.1%	7.4%	10.5%
	Total	100.0%	100.0%	100.0%

Regular Journey * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Regular Journey	Yes	72.6%	70.6%	71.5%
	No	26.6%	29.4%	28.1%
	4	.9%		.4%
	Total	100.0%	100.0%	100.0%

Distance of this trip * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Distance of this trip	Less than 1 Km	4.6%	.7%	2.5%
	1 - 2 Km	10.2%	2.4%	5.9%
	3 - 5 Km	2.6%	27.0%	15.9%
	6 - 10 Km	11.8%	11.5%	11.6%
	11 - 20 Km	36.8%	3.8%	18.8%
	21 - 50 Km	8.4%	4.7%	6.4%
	51 - 100 Km	14.6%	23.1%	19.3%
	More than 101 Km	11.0%	26.8%	19.6%
	Total	100.0%	100.0%	100.0%

Number passengers * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Number passengers	0	1.4%		.7%
	1	18.0%	35.2%	27.3%
	2	13.7%	14.4%	14.1%
	3	6.9%	15.1%	11.4%
	4	13.3%	12.2%	12.7%
	5 - 10	24.7%	16.1%	20.1%
	11 - 15	13.5%	4.2%	8.5%
	16 - 20	4.6%	1.5%	3.0%
	21 or more	3.6%	1.3%	2.4%
	Total	100.0%	100.0%	100.0%

Weight loaded * Island Crosstabulation

% within Island

		Island		
		Efate	Santo	Total
Weight loaded	None	30.7%	86.3%	61.3%
	1 - 100 kg	10.2%	7.5%	8.7%
	100 - 500 kg	8.8%	1.5%	4.8%
	500 - 1000 kg	20.1%	.8%	9.4%
	1,000 - 2000 kg	14.5%	1.2%	7.2%
	2,000 - 5000 kg	6.2%	.3%	3.0%
	5,000 - 10,000 kg	3.3%	2.0%	2.6%
	More than 10,000 kg	6.2%	.5%	3.0%
	Total	100.0%	100.0%	100.0%

E.3 Data treatment and methodology

The data were weighted using the information from the trip counters at the 7 locations to weight up the journeys to a weekly total in three time bands:

06.00 to 9.59

10.00 to 13.59

14.00 to 17:59

Narrower time bands were not possible because of the relatively small sample size and the large weights which would result from this. Data was not collected from vehicles after 18:00, therefore this represents only daytime traffic. Only at Mele was there a substantial volume of traffic after 18:00 hours

The weights used were as follows:

Table 6.1 Passenger Survey weights

EFATE			
Mele	43.38	17.80	60.00
Tanoliu	9.35	6.68	9.71
Takara	14.38	15.92	75.25
Rentapao	1.69	4.97	5.09
Pangpang	9.30	7.92	33.25
SANTO			
End of seal	10.89	19.73	22.63
Matevulu	28.89	27.26	48.04
Junction	10.60	16.40	27.33
Kole junction			

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Type of vehicle * Island	1.069E4	99.1%	92.680	.9%	10783.147	100.0%
Owner of vehicle * Island	1.069E4	99.2%	91.228	.8%	10783.147	100.0%
Used for business * Island	1.076E4	99.7%	27.844	.3%	10783.147	100.0%
Type of business * Island	8304.311[a]	77.0%	2478.836	23.0%	10783.147	100.0%
Activity of business * Island	8246.346[a]	76.5%	2536.800	23.5%	10783.147	100.0%
Kilometres travelled last week * Island	1.060E4	98.3%	182.037	1.7%	10783.147	100.0%
Purpose of trip * Island	1.074E4	99.6%	44.237	.4%	10783.147	100.0%
Regular Journey * Island	1.068E4	99.0%	103.724	1.0%	10783.147	100.0%
Distance of this trip * Island	1.033E4	95.8%	457.929	4.2%	10783.147	100.0%
Number passengers * Island	1.078E4	100.0%	0	.0%	10783.147	100.0%
Weight loaded * Island	1.057E4	98.0%	217.193	2.0%	10783.147	100.0%

a. Number of valid cases is different from the total count in the crosstabulation table because the cell counts have been rounded.

The weighted results show 19, 783 journeys – it should be noted that although the trip counters could record multiple journeys, drivers of vehicles were asked to participate just once, and a sticker was attached to vehicles that had already taken part.

The interviewers based at the 7 locations stopped passing vehicles as time permitted. No records have been kept of non-response and this should be done in future. In addition a number of enumerators in the Efate area were poorly supervised, and did not collect all the necessary information. Missing data on time has been imputed from the 'next neighbour' at the same location on the same day, 42 records were imputed from 615 valid cases. No other data were imputed.

Comment [t3]: Actually records have been kept but with my computer problems we could not access them.

E.4 Dates of survey

Date survey * Island Crosstabulation

Count

		Island		
		Efate	Santo	Total
Date survey	01-MAY-2008	3	0	3
	08-MAY-2008	2	0	2
	09-MAY-2008	1	0	1
	21-MAY-2008	1	0	1
	24-MAY-2008	1	0	1
	26-MAY-2008	1	0	1
	27-MAY-2008	92	0	92
	28-MAY-2008	94	0	94
	29-MAY-2008	69	0	69
	30-MAY-2008	37	0	37
	31-MAY-2008	47	0	47
	01-JUN-2008	22	0	22
	02-JUN-2008	9	0	9
	05-JUN-2008	1	0	1
	08-JUN-2008	1	0	1
	10-JUN-2008	1	0	1
	27-JUN-2008	1	0	1
	28-JUN-2008	1	0	1
	19-AUG-2008	0	2	2
	20-AUG-2008	0	73	73
	21-AUG-2008	0	61	61
	22-AUG-2008	0	72	72
	23-AUG-2008	0	29	29
	24-AUG-2008	0	16	16
	25-AUG-2008	0	8	8
	26-AUG-2008	0	9	9
	27-AUG-2008	1	0	1
	28-AUG-2008	1	0	1
	Total	386	270	656

E.5 The SPSS syntax used for processing the passenger survey

```
Date and Time Wizard: hour.
COMPUTE hour=XDATE.HOUR(Tos).
VARIABLE LABEL hour "hour of survey".
VARIABLE LEVEL hour(SCALE).
FORMATS hour(F8.0).
VARIABLE WIDTH hour(8).
EXECUTE.

RECODE Vil (CONVERT) ('1'=1) ('2'=2) ('3'=3) ('4'=4) ('5'=5) ('6'=6) ('7'=7) ('8'=8) INTO Zone.
VARIABLE LABELS  Zone 'Village sampled'.
EXECUTE.

IF  (Zone = 1 & Hour < 10) weight=43.38.
IF  (Zone = 1 & (Hour > 9 & Hour < 14)) weight=17.8043.
IF  (Zone = 1 & (Hour > 13 & Hour < 19)) weight=60.0000.
IF  (Zone = 2 & Hour < 10) weight=9.35.
IF  (Zone = 2 & (Hour > 9 & Hour < 14)) weight=6.6774.
IF  (Zone = 2 & (Hour > 13 & Hour < 19)) weight=9.7097.
IF  (Zone = 3 & Hour < 10) weight=14.38.
IF  (Zone = 3 & (Hour > 9 & Hour < 14)) weight=15.9231.
IF  (Zone = 3 & (Hour > 13 & Hour < 19)) weight=75.2500.
IF  (Zone = 5 & Hour < 10) weight=1.69.
IF  (Zone = 5 & (Hour > 9 & Hour < 14)) weight=4.9697.
IF  (Zone = 5 & (Hour > 13 & Hour < 19)) weight=5.0938.
IF  (Zone = 4 & Hour < 10) weight=9.30.
IF  (Zone = 4 & (Hour > 9 & Hour < 14)) weight=7.9231.
IF  (Zone = 4 & (Hour > 13 & Hour < 19)) weight=33.2500.
IF  (Zone = 6 & Hour < 10) weight=10.89.
IF  (Zone = 6 & (Hour > 9 & Hour < 14)) weight=19.7292.
IF  (Zone = 6 & (Hour > 13 & Hour < 19)) weight=22.625.
IF  (Zone = 7 & Hour < 10) weight=28.89.
IF  (Zone = 7 & (Hour > 9 & Hour < 14)) weight=27.2593.
IF  (Zone = 7 & (Hour > 13 & Hour < 19)) weight=48.0417.
IF  (Zone = 8 & Hour < 10) weight=10.60.
IF  (Zone = 8 & (Hour > 9 & Hour < 14)) weight=16.4000.
IF  (Zone = 8 & (Hour > 13 & Hour < 19)) weight=27.3333.
EXECUTE.

* Define Variable Properties.
*Q2.
MISSING VALUES Q2(0).
EXECUTE.
MISSING VALUES  Q3(0).
EXECUTE.
MISSING VALUES  Q5(0).
EXECUTE.
MISSING VALUES  Q6(0).
EXECUTE.
MISSING VALUES  Q7(0).
EXECUTE.
MISSING VALUES  Q10(0).
EXECUTE.
```

```
MISSING VALUES Q11(0).
EXECUTE.
MISSING VALUES  Q13(0).
EXECUTE.
MISSING VALUES  Q15(0).
EXECUTE.
MISSING VALUES  Q4(0).
EXECUTE.

WEIGHT BY weight.

CROSSTABS
  /TABLES=Q2 Q3 Q4 Q5 Q6 Q7 Q10 Q11 Q13 Q14 Q15 BY Isl
  /FORMAT=AVALUE TABLES
  /CELLS=COUNT
  /COUNT ROUND CELL.

CROSSTABS
  /TABLES=Q2 Q3 Q4 Q5 Q6 Q7 Q10 Q11 Q13 Q14 Q15 BY Isl
  /FORMAT=AVALUE TABLES
  /CELLS=COLUMN
  /COUNT ROUND CELL.
```

Annex F Public Works Department Monitoring

F.1 Example of new forms which has been introduced for monitoring

MONTHLY REPORT 2009

PENAMA DIVISION | **KPI**

	ACTIVITY	UNIT	PLANNED	ACTUAL	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1.0	ROUTINE MAINTENANACE,UNSEALED ROADS	KM	100	18.1	0	0	0	0	13.1	3			
2.0	PERIOD MAINTENANCE, UNSEALED ROADS	KM	148	36.68	7	13.1	8.98	3.6	2.6	4.6			
3.0	PERIOD MAINTENANCE, SEALED ROADS	KM	N/A	0	0	0	0	0	0	0			
4.0	POTHOLE AND EDGE, UNSEALED ROADS	KM	N/A	6	0	0	0	0	6.0	0			
5.0	VEGETATION CLEARANCE	KM	300	27.82	3	2.1	10	3.7	6.02	3			
6.0	ROAD FURNITURE	KM	50	0	0	0	0	0	0				
7.0	QUANHYING	M3	10,000 (6mths)	4356	0	1206	958	796	594	792			
8.0	ROAD INVENTORY	KM	200	0	0	0	0	0	0				
9.0	BRIDGES	KM	150	0	0	0	0	0	0				
10.0	DRAINAGES	KM	100	10	0	0	0	0	10				
11.0	ROAD INSPECTION	KM	300	279.5	0	160	93	0	6.5				

		UNIT	PLANNED
1.0	ROUTINE MAINTENANACE,UNSEALED ROADS	KM	100
2.0	PERIOD MAINTENANCE, UNSEALED ROADS	KM	148
3.0	PERIOD MAINTENANCE, SEALED ROADS	KM	N/A
4.0	POTHOLE AND EDGE, SEALED ROADS	KM	N/A
5.0	VEGETATION CLEARANCE	KM	300
6.0	ROAD FURNITURE	KM	50
7.0	QUANHYING	M3	10,000
8.0	ROAD INVENTORY	KM	200
9.0	BRIDGES	KM	150
10.0	DRAINAGES	KM	100