

Review of the Kiribati Education Management Information System (KEMIS)

Independent Consultant Report

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And

AusAID

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Acronyms and abbreviations

CFS	Child Friendly Schools
Digest	(Annual) Digest of Education Statistics
EFA	Education for All
EMIS	Education Management Information System
GoK	Government of Kiribati
KEIP	Kiribati Education Improvement Program
KEMIS	Kiribati Education Management Information System
KIT	Kiribati Institute of Technology
MFED	Ministry of Finance and Economic Development
MISA	Ministry of Internal and Social Affairs
MoE	Ministry of Education
PINEAPPLES	Pacific Island Nation Evaluation Analysis Policy and Planning Leveraging Education Statistics
PSSC	Pacific Senior Secondary Certificate
PSO	Public Service Office
TA	Technical Assistance
TL	Team Leader
ToR	Terms of Reference

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Executive Summary

Introduction

The Kiribati Ministry of Education (MoE) is responsible for the collection of annual school statistics from all primary and secondary schools in Kiribati. An annual survey form is sent out to schools to collect this data which is then tabulated within KEMIS and used for the production of the Digest (Digest), and for policy and decision-making. The KEMIS system can hold a wide variety of education data, currently primarily taken from the annual survey. In 2009, work started to import examination results from the MoE Examination Unit system (ATLAS) – currently this is a partial set of data, due to import module limitations. KEMIS can generate a wide range of reports, tables and statistics from the data it holds, including EFA indicator tables, Nation and District summaries (included with the Digest), and School Feedback Reports.

KEMIS was initially started as part of a six week project in 2002 involving UniQuest Pty Ltd, AusAID, and the Government of Kiribati (GoK). The purpose was to collect and compile data to establish the educational position of Kiribati under the “Education For All” initiative. The UniQuest system, later to be called PINEAPPLES, was established with this data requirement in mind. The education management information system was developed by UniQuest and is based Microsoft’s Access database - the system in Kiribati is known as KEMIS (Kiribati Education Management Information System).

Since that time, KEMIS has developed into an extensive system of data collection and data storage for use by the MoE. KEMIS and the annual survey are managed within the MoE by the Statistics Unit. The Statistics Unit is responsible for creating the survey, sending out the questionnaire to schools, and the data entry into KEMIS from the returned survey forms. The principal output from KEMIS produced by the Statistics Unit is the Digest. The Statistics Unit is responsible for the distribution within the MoE, and to other relevant government agencies, and to schools.

Under the May 2010 Terms of Reference provided by AusAID, the KEMIS was to be reviewed and evaluated, with a particular focus on the system, key outputs, sustainability, and end-use.

The review

The KEMIS review included the following components: preparatory work, including report reading and any communications prior to field visit; fieldwork in Australia and Kiribati, preliminary writing and verbal debrief to AusAID (Kiribati); draft and final reporting.

The team that conducted and implemented the KEMIS review in Kiribati consisted of:

- Mr. Oscar Struijvé (Team Leader)
- Mr. Brad Hinton (AusAID Representative, Canberra)
- Mrs. Maria-Teretia Kaiboia (GoK representative)

The Government of Kiribati representative joined the Team Leader and AusAID Representative in all meetings except for the debriefing with AusAID, and also participated in a number of team discussions, providing valuable background information on the Kiribati education system.

The Team Leader and AusAID Representative acted as a team during the meetings, visits and teleconferences in Kiribati, asking questions and leading discussion from their respective areas of expertise and in accordance with task descriptions as described in the ToR. They met with UniQuest in Brisbane before departing for

Tarawa, to ascertain their perspective and collect additional information on the development of the Pineapples software and the process and various stages of support and implementation activity for KEMIS provided as Technical Assistance to the GoK and the MoE in particular.

The Evaluation team thanks all individuals and organizations who provided the essential input and support for their work. The Team Leader is particularly grateful for the excellent contributions to the field work from Brad Hinton and Maria-Teretia Kaiboia. Brad Hinton also provided a stand-alone report that has fed into and significantly influenced this report. Adeola Capel (Senior Program Manager, Education for AusAID, Kiribati) and David Coleman provided insightful comments on an earlier draft, which have helped to shape this final version. The content, conclusions and recommendation in this report remain the sole responsibility of the TL.

The KEMIS information chain

It is important to understand the operational context within which KEMIS works, by looking at the information chain. The chain identifies each step from beginning to end for KEMIS, to identify the relationships between each step, potential constraints and blockages, and the implications for later steps along the chain.

The information chain for KEMIS can be described thus:

- Annual school survey/questionnaire developed by Statistics Unit in MoE (linked to fields in KEMIS)
- Questionnaire published with covering letter
- Questionnaire and cover letter sent to all schools with a fixed deadline for completion
- School principals or head teachers complete the survey
- Surveys sent back to the Statistics Unit of the MoE in Tarawa
- Statistics Unit inputs data into KEMIS
- Statistics Unit checks data against previous year to look for discrepancies
- Data collated for each field in KEMIS
- Statistics Unit chases up surveys not yet returned
- Data collection completed at cut-off date (usually June)
- Data entry completed and checked
- Annual Digest of Education Statistics produced by Statistics Unit of MoE
- Annual Digest of Education Statistics distributed

During the life of the information chain, the Statistics Unit responds to questions from stakeholders using the data from KEMIS. Stakeholders include the MoE, other government agencies such as the Ministry of Finance and the Public Service Office, government educational authorities such as Kiribati Teachers' College and the Kiribati Institute of Technology, and international agencies such as UNICEF. The provision of information from KEMIS is either in the form of raw data (in the majority of cases) or with some form of analysis (often comparative over time, or looking at relationships between fields – such as the relationship between student numbers and teachers).

Conclusions

The information chain for KEMIS starts with the data capture of school information from the schools and the reporting of the aggregated data in the Digest. In practice, the process is satisfactory but would improve with some refinements. Schools should have a greater appreciation of the purpose and use of the annual survey to ensure compliance, timeliness and data integrity. Schools need feedback and evidence that the data provided has some meaning for them.

Completion rates for Senior Secondary have been significantly lower than for Primary and Junior Secondary. Improvements in communication with and feedback to schools may improve this. If return rates remain low, making returns compulsory, and sanctions, can be explored as options. Reasons for non-completion must be established. Compulsory return requires a formal process that involves the Government Statistician.

The Statistics Unit is capable of managing the entire information chain, subject to improving communication and awareness about KEMIS with schools, other stakeholders, and within the MoE. Opportunities exist to optimize the use of data from the KEMIS by generating greater awareness among stakeholders.

Resource constraints in 2009 (Statistics Unit under-staffed by one person) meant that monitoring of data quality at entry-point has been very limited. With the Unit now fully staffed, this should be less of a problem. However options for streamlining data entry, such as recruitment of casual staff can be considered to allow permanent staff to focus on more advanced work including data quality / accuracy checking. Linking use of KEMIS data by MoE staff with feedback processes to the Statistics Unit to establish or improve data quality and veracity seems also possible, e.g. through District Education Officers or in school grants processing.

A potential time-saving mechanism for the MoE, proposed in the KEMIS sustainability plan by UniQuest, is the introduction of KEMIS@School, in schools with access to a computer and electricity, to compile annual school survey returns electronically. However, it needs to be established with a sample of schools if it would encourage participation in the survey by making survey return quicker and easier for them. This is expected to depend on their paper and electronic records keeping practices. From field work, we are concerned that school IT and data management practices are not favourable to electronic data exchange.

In the near-term ongoing technical assistance and support is necessary, at least until the Statistics Unit has the necessary expertise and confidence in KEMIS running on SQL Server. Major technical issues will continue to require external technical assistance, particularly for changes within the PINEAPPLES software that underpins KEMIS. There will be a need to provide targeted and specific training to MoE staff, either in person or in the form of a dedicated training manual and/or quick-start guide, depending on the level of data needs and desktop access to KEMIS. Enhancing awareness of KEMIS within the MoE, including the use of the data for analysis and reporting, would further enhance the effectiveness of KEMIS.

The review confirms that the data within KEMIS is relevant and important to the MoE and other stakeholders in GoK and beyond. Opportunities exist for more analysis with the data but at present there is little real demand for this analysis to be conducted by the Statistics Unit. Stakeholders indicated a satisfactory level of service in meeting relevant education data needs.

Nevertheless, in various discussions and communications, surprise and unease have been articulated that, eight years after work on KEMIS started, a fully sustainable system appears to be lacking. From examination of documents, observations and stakeholder discussions we note:

- With regard to the *external support / TA environment*: the actual work on KEMIS has been conducted over a period of around eight years, but ‘only’ through an intermittent sequence of shorter interventions with specific objectives (typically achieved) which don’t appear to have been designed to result in a situation that is sustainable without external support.
- With regard to *local capacity and resource environment* at MoE / GoK: the human, technical / IT and financial resources are very limited, making it challenging to develop and maintain capacity. Staff rotation in particular has also had a negative impact on attempts to widen the capacity for use of KEMIS and KEMIS outputs, and on the capacity of the Statistics Unit to manage and support it.
- With regard to *results*: a functioning EMIS system has been developed and populated, together with a basic level of local capacity to manage the system, support ‘ad-hoc’ user queries, conduct an annual survey and provide the annual Digest, which includes EFA indicator tables, and national and regional summary statistics.

This amounts to a fragile situation - the observations highlight barriers and limitations in the environment in which results (EMIS system and local capacity) had to be achieved. The recommendations that follow take this into account and seek to build on positive signals to improve stability and allow for and stimulate increased usage of the current KEMIS. The external environment is not sufficiently robust to allow for a much ‘bigger’ EMIS in the short or medium term – especially in terms of data capture and integration with other systems. Early opportunities for improvement relate to: increased knowledge, skills and awareness (at user level and for systems management/support); improvements in the data capture processes (via the survey and now also from the Examinations Unit) and associated feedback loops (the annual School Survey); and developing ‘shared’ structures to support the PINEAPPLES software that underpins KEMIS.

There appears to be an opportunity to integrate KEMIS more broadly within the National Education Framework – the review team heard how KEMIS has been a “stand alone” project. Integrating or networking data between KEMIS and other education statistical collection points, such as curriculum development, adult education, and other government agencies can be considered, but informants did not articulate a clear need to extend KEMIS’ analytical potential through new functionality or the incorporation of other data sources.

Only when significantly increased awareness and use of KEMIS is achieved, with better understanding of its potential, informed demand for additional data and functionality can be expected to emerge. Extending functionality and data coverage is not seen as a present priority: it may prove too heavy a load for the emerging support capacity in the Statistics Unit, and is not achievable without significant external support.

With the recent shift of KEMIS to SQL Server, the Statistics Unit needs to gain greater confidence in the system before a decentralized approach could be rolled out effectively. Longer term, the balance between centralized (Statistics Unit as intermediary for most KEMIS requests) and decentralized (users interrogate the system/data themselves ‘independently’) models of KEMIS use may shift, if appetite and need for independent use and data exploration increases. There is capacity in the Statistics Unit to provide end-user training within the MoE.

Support for skills and capacity building and transfer *within* the Statistics Unit is needed to reduce reliance on the head of the unit only. A bottleneck is the limited ‘spread’ of skills in the Statistics Unit and the MoE as a whole. Recommendations under “Areas for continued external support” address this through training and the improvement/development of documentation that can be used independently to become familiar with KEMIS. This addresses risks for capacity and skills loss in the unit and beyond, due to churn or retirement.

The overall emphasis we advocate is on increasing awareness and use of KEMIS data, with appropriate associated system and local support capacity; and on harnessing and mobilising what has been developed and

achieved, to create a more solid platform for future system functionality or data expansion, once demand for such emerges. This approach increases the probability of sustainable operation of KEMIS in the future.

Recommendations

The overall challenge looking forward is to ensure that education data continues to be collected and is used to support systematic analysis of patterns trends and progression (against stated MoE, GoK and development partner objectives, EFA indicators etc), and of problems and opportunities within the Kiribati education system. The recommendations below aim to harness KEMIS, its inputs, outputs and environment to deal with this challenge. We group recommendations under the following headings:

- The Annual School Survey
- Improving analysis and reuse of KEMIS data
- The KEMIS software
- Areas for continued external support

We have indicated our view on the priority of recommendations within the groups as follows:

- **priority 1:** Essential, to be addressed in the short term
- **priority 2:** Likely to improve value, use or sustainability; address as soon as resources allow
- **priority 3:** Can improve value, use or sustainability but may require longer lead-in time or conditions (addressed by other recommendations) to be in place; to be addressed medium term

The Annual School Survey

Recommendation 1: ensure that schools receive feedback **[priority 1]**

Each year, appropriate feedback needs to be provided to the schools. This can include a letter or other communication upon receipt of the completed form by the Statistics Unit, and/or a copy of the Digest.

There is a need to establish if individual School Feedback Reports are provided to schools. These reports have the potential to play an important role in creating 'buy-in' from the schools in the survey process. If the School Feedback Report is sent with the subsequent year's survey form, the covering letter should make reference to the report, and explain its value to the school. If the Feedback Report is sent separately from the survey form, we recommend keeping a record of when these are sent out, and addressed to whom. A sample of schools should be approached by the Statistics Unit to verify receipt. A covering letter to the Feedback Report should explain its value to the school and the relation with the annual survey.

Recommendation 2: improve School Survey covering information **[priority 1]**

To improve timeliness and compliance, and encourage accurate and full completion of the survey forms, ensure and verify in every year that the covering letter for the survey:

- *Is appropriate, explaining the purpose of the annual survey and how the information will be used in terms that make sense to the school recipients.*
- *Is reviewed, updated and approved by the Secretary, MoE, before finalization.*
- *Is really sent out and received by schools.*

Recommendation 3: analyse the free text responses to the annual School Survey **[priority 2]**

The concerns and issues expressed in the free text part of the School Survey need to be analysed to inform policy and planning processes and to provide feedback to schools. There is scope to index the free text responses against pre-determined categories to allow analysis of trends, themes and recurring patterns.

Recommendation 4: explore making the annual School Survey response compulsory [priority 3]

If return rates remain low despite efforts to improve the survey and associated communications, compulsory return can be considered, with possible sanctions on failure to comply. This requires a formal process that involves the Republic Statistician. Reasons for non-completion need to be researched and possible side-effects on veracity /accuracy of data need to be taken into account – if schools only return the forms because they have to, there is a risk that minimal attention is paid to correctness. (See also recommendation 7)

Improving analysis and re-use of KEMIS data

To stimulate wider, more systemic, ‘embedded’ use of KEMIS data, interventions throughout the data chain are required. The recommendations in this section focus on training in the MoE, involving potential users in feedback processes to establish and improve KEMIS data quality, and improving awareness and exposure to KEMIS in school and for stakeholders in GoK and beyond.

Recommendation 5: Training in data analysis for MoE [priority 1]

It makes sense to initially focus on the MoE. Staff churn has been a barrier for sustained training impact in the past. Nevertheless, training efforts should be continued, but with the main responsibility and leadership internal to the MoE. Training in data analysis is required to transform availability of KEMIS data into use for policy and planning. This holds for MoE internal and external stakeholders. The head of the Statistics Unit indicated that the capacity is there to provide significant elements of such training, depending on the exact requirements. It can be augmented by initial support to ensure that training materials and documentation are available and sufficient capacity exists in the MoE, notably the Statistics Unit, to internalize and fulfil this role.

Recommendation 6: conduct an information campaign about KEMIS amongst key stakeholders [priority 1]

Initiate a focused campaign to increase the level of awareness of KEMIS among key stakeholder groups, especially the GoK agencies and development partners beyond the MoE, to stimulate use of KEMIS outputs and address the current lack of, and unevenness in, awareness. Keep in dialogue to ascertain and understand their data needs. Over time, information within KEMIS and the way it is presented in reports and other outputs can be optimized to target specific (identified and recurrent) requirements.

Recommendation 7: involve data users more in verifying data quality and gaps [priority 2]

KEMIS data users can be encouraged to help determine the veracity and accuracy of data. More up-to-date information can be sourced from other areas within the MoE: e.g. the District Education Officers, when making preparations for visits, are using KEMIS data (e.g. School Feedback Reports and District Summaries). They may be able to establish anomalies (either for individual schools or at a higher level e.g. with Island Councils) and report these back to the Statistics Unit. Similarly School Feedback Reports and other KEMIS data can be used and verified by staff processing school grants/funding. This can help to mainstream KEMIS within the MoE and create more involved users. If schools understand that KEMIS data is used in these processes, this can be an incentive for survey participation. (See also recommendations 1 and 2)

Recommendation 8: attention to education statistics and KEMIS in teacher training [priority 2]

Given the crucial importance of the schools’ continued cooperation in the annual survey, attention should be paid to education statistics and the role of KEMIS in teacher training, to create awareness of the process teachers may be asked to participate in, and builds capacity in schools to interpret and use the feedback they

should receive. A short course or presentation on education statistics and the role of KEMIS should be part of on-going (in-service) teacher training and the Kiribati Teacher Training College curriculum for new teachers.

Recommendation 9: making KEMIS data readily available in the public domain [priority 3]

Convenient availability of KEMIS data to interested parties will stimulate demand and encourage further sharing of information. There is scope to have KEMIS data, as well as the Statistical Digest and other KEMIS products, made available in the public domain. Making the data accessible through easily and widely accessible services and systems, on a website, is recommended. With a lack of reliable Internet services in Kiribati, such a site may need to be hosted elsewhere by an international or regional agency. It can be linked to a regional shared service (See recommendation 11)

The KEMIS software / PINEAPPLES

The Statistics Unit can conceivably become and remain fully (or near) self-sufficient with regard to operation of KEMIS and provision of support to users through reporting, data analysis and end-user training. But it is not equipped to develop, change, or provide advanced support for PINEAPPLES software components. It is not realistic to expect the Statistics Unit, the MoE or GoK to develop this capacity. For these aspects technical system and system development support will be required into the future¹. The recommendations in this section are designed to make the necessary continued support better sustainable.

Recommendation 10: Stability of KEMIS / PINEAPPLES functionality [priority 1]

Stability in the KEMIS system is favoured over expansion of functionality. Issues and barriers have been identified in the system environment, which can and should be addressed to increase KEMIS value and use (see the other recommendations under all four headings) before expansion of the KEMIS system and data coverage. KEMIS/PINEAPPLES development work that is essential for MoE requirements will still require support.

Recommendation 11: investigate regional sharing and cooperation around PINEAPPLES [priority 1]

There is scope to explore cooperation models for PINEAPPLES users on a regional (Pacific) basis, in a context of “shared services” that may include: sharing and publishing data held by the various nations, sharing of PINEAPPLES expertise and experience, setting up and managing structures/facilities for joint system support (backup, second-tier technical support, help-desk etc) and joint negotiation, procurement and licensing. The aim is to improve sustainability of technical and system development support. The cost and effort that is required to run a regional forum and shared services to leverage needs to be taken into consideration.

Recommendation 12: establish the ownership and IPR situation surrounding PINEAPPLES [priority 2]

Uncertainties regarding ownership of the PINEAPPLES system and KEMIS data are barriers for development of shared services and KEMIS. UniQuest has advised that they believe that PINEAPPLES is still owned by AusAID. However, the review team did not see evidence that clarifies the current ownership of PINEAPPLES. It is important to ascertain the current ownership structure before looking at how collaboration, information-sharing and further system development can take place. It is important that AusAID determines the ownership and licensing details of PINEAPPLES as soon as possible, taking into consideration opportunities for use in other Pacific countries and for establishing regional groups, platforms or shared services. (See recommendation 11)

¹ E.g. it is expected that in the future the MoE will need to analyse and report on Pacific Senior Secondary Certificate (PSSC) results. This will require further development work on the import module for examinations data.

If the current situation is found to be inappropriate for effective and efficient continued use, development and roll-out of PINEAPPLES-based EMIS systems including KEMIS, AusAID should take the initiative to negotiate with rights-holders and licensees a more appropriate structure. Such a structure could be constructed, with the agreement of current rights holders, according to a variant of Open Source Licensing and could be linked to a regional entity, managing shared service provision for countries that use PINEAPPLES-based EMIS systems.

Areas for continued external support

Technical changes and development work for KEMIS will continue to require assistance. Recommendations in the previous section enable an environment within which this can be managed more easily. Two further areas are proposed in which external support is needed and can strengthen the independent capacity in the MoE.

Recommendation 13: external support: training for the Statistics Unit [priority 1]

With the relatively recent shift of KEMIS to SQL Server, the Statistics Unit needs to gain greater confidence with the new system before a decentralized training approach could be rolled out effectively.

The emphasis for training support should be on maintaining and improving expertise within the Statistics Unit, ensuring that the capacity of this unit reflects the critical importance of KEMIS maintenance, yearly conduct of the School Survey, production of the Digest and effective and efficient support for information requests. It is important that multiple staff members retain or acquire the ability to support KEMIS requests, can perform basic and advanced KEMIS management tasks, and can provide training in data analysis.

Recommendation 14: external support: documentation (training manual and quick-start guide) [priority 2]

Reliance on external technical assistance for training is insufficient: making available a targeted training manual and quick-start guide for KEMIS can support on-going, regular training for MoE staff within the available resources. The guide could cover the basics of importance of statistics, safe computer practices, and data analysis. The content of the training manual would need to consider the ways in which potential users are expected have access to KEMIS and to the annual Statistical Digest, and what their likely data use will be.

A dedicated and specific training manual would also help any new starter within the Statistics Unit gain a certain level of competence without the need for TA, or substantial delay in being able to use KEMIS.

Recommendation 15: investigate viability and impact on schools of introducing KEMIS@School [priority 3]

Establish with a sample of schools with access to a computer and electricity if using KEMIS@School to compile annual school surveys electronically, would make survey return quicker and easier for schools and encourage participation in the survey. It is a potential time-saving mechanism for the MoE but how it affects schools would depend on their paper and electronic records keeping practices. From field work, we are also concerned that school IT and data management practices are not favourable to electronic data exchange, and this needs to be taken into account when assessing the suitability and potential impact of KEMIS@School.

Evaluation Criteria Ratings

In this section we provide indicative ratings for the quality of the *aid activity*, based on analysis of the documentation provided to the team as well as meetings, observations and discussions as listed in Annex 5. The criteria and rating scale have been provided by AusAID.

The ratings of the aid activity (understood as the totality of KEMIS development, support and operation activity within the scope of the ToR) should be read and understood in conjunction with the conclusions and recommendations in this report and the specific questions and issues listed in the ToR (see (Annex 4) and addressed by this *review of KEMIS use and functionality*.

Evaluation Criteria	Rating (1-6)
Relevance	5
Effectiveness	4
Efficiency	5
Sustainability	4
Gender Equality ²	4
Monitoring & Evaluation	5
Analysis & Learning	4

Rating scale:

Satisfactory		Less than satisfactory	
6	Very high quality	3	Less than adequate quality
5	Good quality	2	Poor quality
4	Adequate quality	1	Very poor quality

² No specific information was made available that warrants a higher or lower score than 'adequate'. This score is about Gender Equality *in the aid activities* underpinning KEMIS. However, when considering the potential relevance and importance of the KEMIS system itself for monitoring, evaluating and improving Gender Equality in the Kiribati education system, a higher score (5) would be awarded.

Responses to the Terms of Reference

Timely collection and analysis of education system performance data

The information chain for KEMIS involves a systematic collection of educational statistical data and the input of that data into a computerized management information system. The collection of the data is annual. The data is used to produce the Digest. The Statistics Unit within the MoE is responsible for the collection, data entry, and analysis of the data. There is some awareness within the MoE, and in other government agencies, as to the existence of the Statistics Unit within the MoE.

Given the geographic context of Kiribati, delays occur in receiving the completed survey forms from schools due to transportation problems. However, not all delays and non-compliance can be attributed to this. The survey takes considerable time to complete and some questions are especially difficult to complete (e.g. the number of children within a community with disabilities). Interviews at schools indicated that there was no information surrounding the purpose and use of the survey information, and there was no feedback to the schools that completed the survey. Schools were complying out a sense of duty, but with little knowledge as to how the information would be of benefit to them. Given resource and time constraints on teachers and principals, the motivation to complete the survey and return the form in a timely manner was variable.

Once the information from schools is received by the MoE (Statistics Unit), the data is entered into KEMIS and checked against the preceding year's information. If there are discrepancies, a follow-up enquiry is made to the school concerned. The Statistics Unit has a list (in KEMIS) of the date at which survey forms are sent out. All survey forms are supposed to go out at the same time. However, when we examined KEMIS we noted that there were instances where the mail-out to schools had not been recorded. Since the physical distribution of the surveys is made by another section within the MoE, the Statistics Unit is reliant on that section sending out the forms and confirming distribution. When a school is expecting to receive a survey (usually based on past experience), but has not received one, they may contact the MoE.

KEMIS is reliant on the timely distribution of the survey form and the timely completion of the form by schools. We were assured by the Statistics Unit that a cover letter was sent with the survey form to schools explaining the purpose of the survey. The majority of Principal and Head Teachers we interviewed indicated that they had not seen it, or could not recall having seen it. In one instance we saw the 2010 survey form at a school with the cover letter. However, we noted that the text of this letter was identical to the 2009 version. It referenced a GoK and AusAID program, to explain why a new section (Building Inventory) had been added, emphasizing the importance of completion. This identical reference in subsequent years confounded the respondent and did not encourage a belief in genuine follow up action informed by schools' efforts to complete and return correct data. Without a relevant cover letter being distributed and received with the survey each year, explaining the purpose and importance of the information, there is a risk for delay and non-compliance with negative effects on completion rates and data quality. We did not see evidence to suggest that the Digest was unduly delayed by the lateness of data from schools.

We understand that completion rates for Senior Secondary schools have been significantly lower than for Primary and Junior Secondary. Improvements in communication and feedback to schools may improve this. Making returns compulsory, and sanctions, can be explored if return rates remain low and reasons for non-completion have been established. Compulsory return requires a formal process involving the Republic

Statistician. Effects on veracity /accuracy of data need to be taken into account – if schools only return the forms because they have to, there is a risk that no or minimal attention is paid to correctness.

We saw no evidence of delays in data entry of survey information once the information was received by the Statistics Unit. The Statistics Unit indicated that they follow up on forms that are not submitted in time.

KEMIS has provided a systematic infrastructure and encourages a set of behaviours for regular and timely collection of school information for the MoE. However, delays in returning completed forms, incomplete forms, and non-compliance are significant risks to data quality and, potentially, the timeliness of the Digest.

To improve timeliness and compliance, an informative and persuasive covering letter needs to be attached to the survey, explaining the purpose of the survey and how the information will be used. There needs to be feedback for the schools, either in the form of a letter or other communication upon receipt of the survey at the Statistics Unit, and/or a copy of the Digest distributed each year. A short individual School Feedback Report is also supposedly made available to schools. We did not hear from interviews of any school receiving it. Provision of such a feedback report, assuming it is indeed received by the intended targets (Principals and Head Teachers) in schools and properly introduced and presented, may contribute significantly to creating schools' engagement with the annual survey process and a sense of ownership of results.

Preparation, verification, dissemination and analysis of KEMIS data (for MoE)

The Statistics Unit with the MoE is primarily dependent on the information provided by schools to KEMIS via the Annual School Survey. It follows that accuracy and timeliness of the information from the schools is critical for provision of accurate systems data and in maximizing subsequent opportunities for analysis. Interviews at schools indicated a strong desire to complete the surveys as accurately as possible, despite the issues referred to earlier of lack of clarity around the purpose of the survey and perceived lack of feedback.

There is a risk that data quality could be compromised if the survey becomes too time consuming, or there is lack of commitment to complete the annual survey forms as accurately as possible. We did not see any evidence that data quality has been compromised in this way for the 2009 survey and earlier.

School survey data is normally checked against the preceding year and discrepancies are identified and followed-up with schools by the Statistics Unit. Due to resource constraints (Statistics Unit under-staffed by one person) monitoring of data quality in 2009 was very limited. With the Unit now being fully staffed, this should be less of a problem. Options for streamlining data entry, e.g. recruitment of casual staff, can be considered to allow permanent staff to focus on more advanced work including data quality / accuracy checks.

We were told that the National Statistics Office checks KEMIS data against the corresponding Census data. The Republic Statistician felt that KEMIS and Census education data were within acceptable bounds of data quality.

A short review of KEMIS and analysis of KEMIS documentation provided some comfort that the system is comprehensive and can cover the majority of needs of the MoE. The recent addition of examination results data to KEMIS has strengthened the potential usefulness of KEMIS within the MoE³. The key *regular* output from KEMIS is the Digest. Other than the annual School Feedback Reports that KEMIS can provide to schools, there was no other regular reporting or reporting requirement brought to our attention. The review team asked MoE stakeholders whether more regular and formal reporting should be provided. The response was

³ KEMIS can already import some examination data from the Exams Unit but in the future the MoE will need to analyse and report on Pacific Senior Secondary Certificate (PSSC) results, in which case the import module needs further work.

consistently that *on-demand* arrangements are working satisfactorily. This explains why there is currently little evidence of significant regular data analysis or formal reporting by the Statistics Unit using KEMIS.

Reporting requests from the MoE, and other stakeholders, are dealt with by the Statistics Unit at the time they are received. We did not see evidence that these requests were not met in a timely manner.

Many predefined reports can be generated by KEMIS. Data and tabular outputs from KEMIS can be used within Excel to produce further charts and graphs for reporting and analysis. Currently, stakeholders typically request specific information from the Statistics Unit who extract the information from KEMIS and provide the results to the client. This can take the form of an answer by phone, an email with the specific data or outputs, or more substantial system reports or tabulations provided as electronic files or in print.

Desire was expressed by interviewees within the MoE (confirmed by the Statistics Unit) to have the KEMIS system itself made more broadly available, but this would require considerable training and much improved levels of data security, including safe computer practices (e.g. avoiding viruses). The facility already appears to exist to access KEMIS functionality from various PCs in the MoE. With the exception of the Facilities Manager, none of the people we spoke to had been trained to use KEMIS (in part due to staff churn), or had the skills and confidence to attempt to use the system without training.

Therefore, the impact of *user-friendliness* of the system outputs is mainly felt within the Statistics Unit itself. There is potential to provide or conduct more analysis based on immediate KEMIS outputs in alternative user-friendly formats⁴, but there was no evidence of strong demand. As the former Director of Education put it, “the data needs for a small country as ours are not the same as for a developed country”.

Information provision within the MoE comprised mainly of data extracts or sections (tables, charts, etc.) from the Digest. For example, earlier this year (2010) the Director was asked to produce a report for the Secretary of Education. The Director requested the data from the Statistics Unit and used that data within the report.

Further data analysis can potentially be conducted from data and reports by the recipients, but very few interviewees were able to provide examples of such analysis actually taking place, within MoE or beyond⁵. As to potential demand, the examinations unit aspires to undertake an analysis of the school exam results but there are insufficient computer and data analysis skills in the examinations unit to do the work.

There was also no specific demand for the Statistics Unit itself to undertake deeper analysis of KEMIS data from the MoE or other stakeholders⁶. The Statistics Unit informed us that additional data analysis would be time-consuming, but possible, even in the short-term, if there was a demand for this type of service.

Provision of data to inform education planning, management and budgeting

Awareness of the Digest and the education information available within KEMIS is variable, both inside the MoE and externally. Part of the reason for this unevenness and lack of awareness in some quarters is the high turnover/rotation of staff within the MoE and in other government agencies. However, the rotation mechanisms also meant that some interviewees in other GoK agencies knew of KEMIS because they had

⁴ Much of the information can be presented in Excel workbooks, using pivot-tables which allow drilling-down to underlying data as well as relatively easy manipulation and alternative representation of data.

⁵ One example of external analysis of KEMIS outputs is presented in the next section.

⁶ Tentative suggestions for including new data and information not currently within KEMIS were made, but these referred to perceived information needs or gaps (e.g. with regard to accuracy and currency of payroll and annual leave data) which appear to be better served by information systems distinct from KEMIS. PINEAPPLES does however provide some functionality that would allow consideration of including such data, if a case was made to warrant this.

previously worked in the MoE. Improving the level of awareness about the KEMIS and what type of information it can provide more structurally would appear to be advantageous.

The Statistics Unit informed us that the Digest is made available to all Ministers as well as to relevant people inside the MoE. In addition, the Digest has been made available, but on request, to other government agencies, the Kiribati Institute of Technology, the Kiribati Teachers' College, and UNICEF.

In addition to requests for data and information internally within the MoE, requests are made by Parliament, other government agencies, and external stakeholders such as UNICEF. Each request is dealt with by the Statistics Unit at the time it is received. Similar to the MoE situation, we did not see evidence that these requests were not met in a timely manner. Several interviewees from the MoE and other government agencies said that KEMIS data requests made to the Statistics Unit using were answered to their satisfaction.

It can be argued that the provision of KEMIS reports or outputs with education data relating to EFA indicators to agencies including UNICEF (as well as GoK) is recurring regularly and can be seen as a regular output: predefined reports exist for this. Our understanding is however that reporting is triggered by specific requests.

Very few examples of data analysis or formal reporting using KEMIS were encountered: an analytical report was done by the Principal of KIT based on the Digest, and the Head of the National Statistics Office uses data from KEMIS to correlate and triangulate with Census data. Whilst there were some suggestions for new data and information not covered by KEMIS, there was little demand for deeper analysis of KEMIS data.

Initially, the review team was interested in, and looked for, evidence to support development of a more proactive approach to analysis and reporting, including the possibility of producing a variety of short but regular reports to key stakeholders. However, stakeholders quite clearly indicated that the current on-demand approach worked well. Moreover, stakeholders could not identify what type of regular information they would like to receive in a formal or regular publication produced using KEMIS.

In summary, collection, presentation and analysis of information for planning and budgeting all tend to happen "as-needed", although the Digest is used fairly systematically for the provision of data for reporting and budgeting requirements (e.g. to assess and plan response to school infrastructure requirements). There is evidence that more up-to-date information might be sourced from other areas within the MoE (e.g. the District Education Officers responsible for schools within particular geographic areas in Kiribati). We also heard evidence that the Digest was used for planning and reporting from the former Director of Education at the MoE, the Department of Finance (number of teachers), Kiribati Teachers' College (trained and untrained teachers), and at the Kiribati Institute of Technology (analysis of student numbers and examination results).

Users of KEMIS data could be encouraged to help determine the veracity and accuracy of data – e.g. District Education Officers, when going out to schools and making preparations for visits are furnished with KEMIS data (e.g. School Feedback Reports and District Summaries). They may be able to establish anomalies (either for individual schools or at a higher level e.g. with Island Councils) and report these back to the Statistics Unit.

Use and optimization of KEMIS products

The Digest is well used by stakeholders who know of its existence. However, it is important to consider frequency of use and effectiveness of use before determining how a product is optimized.

In Kiribati, the Digest is mainly used to inform planning and, to some extent, budgeting (e.g. the Facilities Management Unit uses KEMIS reporting on school infrastructure). The use of the Digest may be infrequent⁷, but when the information is required or requested at particular periods each year and in the multi-annual planning cycles, the information is important and of fundamental importance. Moreover, having the Digest allows reference to the information throughout the year. Since the information is updated once annually, it triggers a peak demand period followed by a longer on-demand period each year. The on-demand situation occurs throughout the year, and involves a mix of references made to the hard copy of the Digest and information request to the Statistics Unit who will use KEMIS to answer the request.

The review team had a discussion with stakeholders about KEMIS use for *regular* updating of information. For instance, the Public Service Office (PSO) was interested in having individual teacher information within KEMIS, including tracking of movement of staff. While the idea has some appeal, there are significant issues around data collection, data quality, sustainability, and efficiency. More regular updating was not seen as a high priority. Interestingly, stakeholders indicated that for more up-to-date information they generally knew where to go or who to ask for this information. An annual collection of key education data with subsequent compilation of statistics in one or more predetermined reports and combined with a capacity to respond to data queries remains the more realistic option for KEMIS, and corresponds with practice elsewhere. Nevertheless, as mentioned before, there is perhaps untapped scope to encourage users to help determine the veracity and accuracy of data and establish anomalies and feed such findings back to the Statistics Unit.

The biggest weakness around optimizing the information in KEMIS and the Digest relates to lack of and unevenness in awareness. There is some evidence to suggest that there are relevant people within the MoE and in other government agencies who might find value in the information contained within the Digest or via KEMIS more directly. There is also evidence to suggest that individual schools might be interested in the aggregated and disaggregated data within KEMIS if the information coverage of the system was more widely known. By increasing the awareness among key stakeholders, information within KEMIS and the way it is presented in reports and other outputs might be optimized to their specific requirements.

Effective functioning of the KEMIS

KEMIS is providing annual statistical education data to stakeholders, on request and through the Digest. Broadly, users and potential users of KEMIS-held data and outputs declare satisfaction with the service offered. KEMIS is a core data source for the MoE and other government agencies (such as Ministry of Finance, Ministry of Economic and Social Affairs, Public Works, etc.). KEMIS also provides data to stakeholders such as UNICEF, through e.g. its reporting options relating to EFA indicators. As such, it can provide a valuable service for many stakeholders. KEMIS can be used to generate and present data and a range of statistical indicators, including Gross and Net intake rates and enrolment ratios. These are the types of statistics that are provided to e.g. donors and agencies like UNESCO and UNICEF: they are included in the Digest or can be provided in separate reports and tables for further analysis. They should be used for monitoring, planning and reporting.

There are some constraints on how effectively KEMIS has been used by stakeholders and potential stakeholders. These occur at different points along the basic information chain presented earlier.

⁷ in terms of the number of references to the Digest over the course of the year

The schools

We mentioned that KEMIS relies on the timely and accurate completion of the School Survey. It is imperative that Principals and Head Teachers are informed of its purpose and use, receive feedback, and see result (e.g. the Digest and a disaggregated school summary, the School Feedback Report).⁸

Also, the concerns and issues expressed in the free text part of the survey (Section eight, General Comments⁹) need to be acknowledged, even if action is not possible within a time frame expected by schools and the opportunities to provide individual feedback on issues raised may be limited. There is scope to index / code the free text responses against pre-determined categories, to allow analysis for trends, themes and recurring patterns. Such analysis can inform MoE, GoK and external partners' policy and planning and can be offered as feedback to schools. We do not propose that the KEMIS system should be adapted to do this: it can be done externally, as part of annual planning and preparation, based on KEMIS outputs. There is opportunity for a first (manual) categorization when the text is entered in KEMIS from survey returns and a member of staff of the Statistics Unit will be reading and visually inspecting the text.

Given the crucial importance of the schools and their continued cooperation in the survey process, a short course or presentation on education statistics and the role of KEMIS should be provided as part of on-going (in-service) teacher training and at the Kiribati Teacher Training College for new teachers. This would help to create awareness of the process they may be asked to participate in, and builds capacity in schools to interpret and use the feedback they should receive, including the School Feedback Report and the Digest.

The Statistics Unit

Until recently, staff turnover within the Statistics Unit meant that training and development of new skills in data interpretation had to be repeated. It was not clear during the review whether staff turnover issues inside the Statistics Unit affected the effective collation and production of the Digest, but the on-demand service may have been hampered. This is likely given that the Manager of the Statistics Unit, who has been in the role for over four years, is also responsible for IT in the MoE, with limited time available for working with KEMIS. There is now scope for more stability with the employ of a third member of the unit, which brings it up to the intended strength in terms of FTE.

We referred to the option of hiring temporary staff for data entry. A possible time-saving option for the Statistics Unit proposed in the KEMIS sustainability plan by UniQuest, is electronic compilation of survey returns using KEMIS@School, by schools with access to a computer and electricity. How it impacts on the schools depends on their paper and electronic records keeping practices. It is an option to explore with a sample of schools if it makes survey return quicker and easier and encourages participation. This seems essential, if the time-consuming nature is a major reason for non-completion. From what we observed in a small number of schools, IT and data management practices are not favourable to electronic data exchange.

The MoE

At the MoE level, there is scope to increase the level of awareness of KEMIS within selected areas of the Ministry. New members of staff in the Facilities Management Unit and in Scholarships showed a desire to learn and use KEMIS. An education and awareness campaign would improve knowledge about KEMIS and the information that KEMIS holds. There has been some early discussion about making KEMIS more widely

⁸ See also further details under 'Timely collection and analysis of education system performance data'.

⁹ In the 2009 version of the MoE School Survey Form

available at the desktop to staff in the MoE, but this will require significant training and a much greater level of understanding about safe computer practices to avoid viruses and data corruption.

Training in data analysis is required to translate availability of KEMIS data (either from the Digest, on request via the Statistics Unit or direct at the desktop) into actual use of KEMIS for policy and planning. At present, it seems unlikely that wider meaningful rollout of 'direct use' at the desktop of KEMIS is a viable option.

Outside the MoE

From discussion with stakeholders outside the MoE, a picture emerged of a desire to have available and make use of education data more widely. However, much of the articulated potential demand is for information KEMIS does not currently collect. This is not to say that KEMIS does not collect the right data, but rather that interviewees, when prompted to think of their information needs, suggested that there might be opportunities (often by virtue of there being no alternatives) for data collected in other areas to be used within a single management information system – and KEMIS is the system that is known to them. Some of this additional data resides in other Ministries and a subset might be suitable for closer integration with, or inclusion in, KEMIS. Example of such data/information requirements for operational and forward planning purposes includes detailed payroll data in the Ministry of Finance and Economic Development (MFED), and current and historic data on annual leave and retirement of teachers.

However, we will not be recommending this, as the full ramifications of addition of new data such as the above to KEMIS must be much more carefully considered. KEMIS has been constructed for a particular purpose and any additional data collection needs to remain cognizant of that. Adding new data to KEMIS because KEMIS "is there" is not sufficient reason. An electronic document and records management system (EDRMS) or a Financial or HR management system may be more applicable in certain situations than KEMIS. Research into how KEMIS could import specific new types of data or export the data to other systems, and the potential value to be derived, would be necessary, particularly if there are system-technical aspect to the inclusion of further data sources (other than the School Survey and examination data): this would most likely increase dependence on external TA for system development, require additional training and increase the level of resourcing needed at the Statistics Unit.

As an education management information system, based on the brief review at the Statistics Unit, KEMIS appears to be effective and useful. A number of issues that require attention have been identified in the current KEMIS environment: e.g. the information accompanying the School Survey, the feedback loops to schools, and the awareness and understanding of KEMIS and KEMIS products/outputs in MoE and other GoK agencies. First, these aspects should be addressed in a context of relative system stability to increase its value, use and sustainability, as opposed to adding more functionality or data sources to KEMIS.

The main challenge looking forward is to ensure that education data continues to be collected and is used to support systematic analysis of patterns, trends and progression (against stated MoE, GoK and development partner objectives, EFA indicators etc), and of problems and opportunities in the Kiribati education system.

For example, the Principal at the Kiribati Institute of Technology wanted to link school education data to vocational education data (which was not available and was not collected through KEMIS) and look at employment demand to determine the type of courses that should be offered. The Kiribati Teachers College was interested in looking at data from KEMIS to determine where demand for teachers was likely to be in the future, and at what level (primary or secondary). In the latter example, a *Teacher Supply and Demand*

Committee was formed, incorporating stakeholders from the College, the MoE, and the Statistics Unit. Such a structure could be a first enabling steps to use KEMIS data in a more rigorous and analytical way.

A major problem seems to be a lack of skill in using the KEMIS data (and other data sources) for deeper analysis for decision-making, monitoring and evaluation, although we did hear that KEMIS data was used in reports that fed into the Ministry of Education and into Parliament. Developing and maintaining this type of analytical capacity goes beyond KEMIS-specific support and requires a ‘whole-of-government’ (and indeed ‘whole-of-partner’) approach, but would undoubtedly help to unlock value of data available through KEMIS. Positioning future KEMIS support explicitly in the context of, and linking it to, a sector Monitoring and Evaluation System, as proposed in the draft Kiribati Education Improvement Program¹⁰ (KEIP), is necessary to articulate and implement wider incentives and interventions to address issues of skills and awareness across potential users and beneficiaries of KEMIS data. The fact that all KEIP donors are said to have a *critical interest* in KEIP Activity 2.2 (*Establish a sector monitoring and evaluation system and enhance KEMIS to support sector M&E*) is very encouraging, because it provides a framework and a clear incentive and rationale for targeted action to improve data skills and awareness of KEMIS across the education system and GoK agencies.

Current and potential sharing of data in PINEAPPLE

KEMIS information has been made available, on request, to multilateral organizations such as UNICEF and to stakeholders such as AusAID. It could be shared more widely but the information within KEMIS is quite specific to the needs of the MoE (and as an extension of the initial EFA indicators data requirements). For example, in discussions with UNICEF we learned that the data in KEMIS is provided to UNICEF on the basis of “as needed”.

For purposes of sharing of KEMIS data with other stakeholders, who typically want to compare, combine and use a range of sources, it is important to use the same definitions and terms (or map these carefully) across sources and domains, to ensure correct comparison and analysis and quality and reliability of outputs. UNICEF e.g. told us that data outputs from KEMIS are not structured to match UNICEF data requirements for DevInfo. UNICEF is planning to conduct (August 2010) a DevInfo compliant baseline sample survey of primary schools in Kiribati, in the context of Child Friendly Schools (CFS), which allows for international comparison of data. While there are some common data elements in the KEMIS data collection through the Annual School Survey and what UNICEF is planning, there are also differences, including sample size and data sources.

Of potential use would be comparing the data in KEMIS with the PINEAPPLES-based systems in other Pacific Island nations (Nauru, the Solomon Islands and Vanuatu and potentially Niue, Tokelau and Tuvalu). There is scope to share and compare and potentially combine data sources with PINEAPPLES users on a regional basis. We understand that a form of regional co-operation or regional sharing group has been recommended in the past and there is merit in exploring this idea further, in a broad context of a set of “shared services”. This could include: sharing and publishing data held by the various nations, sharing of PINEAPPLES expertise and experience, setting up and managing structures for joint system support facilities (backup, second-tier technical support, help-desk etc) and joint negotiation, procurement and licensing.

The ability to leverage knowledge about PINEAPPLES and the EMIS used by other Pacific Island countries in a regional forum does have a financial cost that needs to be considered. The costs may include travel and accommodation, plus time away from the office. However, there are likely to be considerable benefits through sharing experiences, developing new initiatives based on collective needs (thereby reducing system costs), and in providing mutual support instead of relying on outside technical assistance.

¹⁰ Kiribati Education Improvement Program (KEIP). Phase 1 Design Document, April 2010.

There is scope to have the information within KEMIS, as well as the Digest and other KEMIS outputs, made available in the public domain, to encourage sharing of information. Making the data globally accessible via a website seems possible. With a lack of reliable internet services and infrastructure in Kiribati, such a site may need to be hosted elsewhere to provide a reliable platform, e.g. by an entity like the regional group or a shared service centre discussed above. Reliable access within Kiribati itself may remain problematic.

Uncertainties around ownership of the PINEAPPLES system and KEMIS data may limit the potential options for sharing. UniQuest advised that they do not own PINEAPPLES and believe that it, and the KEMIS data are owned by AusAID and the Government of Kiribati, as evidenced by a recent (17 May 2010) letter to AusAID, shared with the review team. In this letter they seek an agreement which allows UniQuest to continue to make available the PINEAPPLES EMIS software to existing and new partners.

However, the review team could not find any documented evidence that clarifies the current ownership of PINEAPPLES. We were given sight of a letter from AusAID dating to 2004 in which the Commonwealth of Australia grants a non-exclusive license to UniQuest, for the purposes of the Solomon Islands EMIS project, to *“use, reproduce and adapt ... the KEMIS access software, data collection forms and data management systems produced for the development of the Kiribati Education Management Information System”*. It is important to ascertain the current ownership structure when looking at how collaboration and information-sharing can be structured. The review team understands that the *data* in KEMIS is owned by the Government of Kiribati but, again, we have not seen formal documentation supporting this.

It is important that AusAID determines the ownership structure and licensing details for PINEAPPLES and KEMIS, and takes into account opportunities for use in other Pacific countries and for establishing regional shared services.

Human resource implications of, and impacted on, KEMIS

The main human resource implication involved staff turnover at the Statistics Unit, in the MoE as a whole and in other GoK agencies. The review team learned that movement and rotation of staff within and between Ministries in Kiribati was and remains common. The impacts, especially if training in the desktop use of KEMIS is to be supported, are significant. It negatively affects awareness and understanding of what the system is, and is not, and reduces confidence in undertaking data exploration and analysis. New staff in the MoE may not be aware of KEMIS and the educational statistics that might be of use to their work. At the very least, new staff should be made aware of the Statistics Unit and what type of data is available. There is also a need for stakeholders *outside* the MoE to become more aware of KEMIS and the type of education data available.

The staff turnover and rotation situation has a ‘positive’ side-effect: staff in other agencies, who held positions in the MoE, are aware of KEMIS because of this. The team learned that informal communication channels and information exchange are prominent within the MoE as a whole, and in other government agencies. This is also true in relation to KEMIS data: people know where to go or who to ask for specific types of information.

A number of interviews provided information about a lack of computer literacy and data analysis skills in government agencies, which provides a barrier to KEMIS data use. We also heard that the level of analysis required for the needs of Kiribati was potentially lower than for other countries and that the current data provision from KEMIS was sufficient. It is not possible to reliably assess the accuracy of such statements, but we observe that Kiribati faces significant education challenges, which appear as strong and complex as in other countries. Robust data collection and evidence based policy making, underpinned by KEMIS and the annual School Survey, is important. Improving and maintaining data analysis capacities and skills remains a concern.

There was some appetite for staff within the MoE to make use of direct desktop access to KEMIS, but high staff mobility, training requirements, and unsafe computer practices tend to preclude going down this path in the short term for the majority of cases. There is better potential to increase the level of awareness of KEMIS within the MoE and to allow the trained staff within the Statistics Unit to actually undertake the extraction of data. There is potential for training in data analysis to enhance the way in which the data from KEMIS can be used by other MoE staff. The review team understands that some training in data analysis was conducted last year, and there is potential to take this forward, providing more advanced training and by rolling out training to other staff in the MoE and potentially beyond. The head of the Statistics Unit indicated that the unit has the capacity to provide significant elements of such training, depending on the exact requirements.

There is some risk in not devolving direct access to KEMIS to MoE staff. By centralizing knowledge and expertise, the Statistics Unit becomes the gatekeeper and intermediary for most requests that require KEMIS data, and can be described as a potential “single point of failure”. More research is required to establish the best way of dealing with the centralized v. decentralized model of KEMIS use. At present, with the relatively recent shift of KEMIS to SQL Server, more than anything else the Statistics Unit needs to gain greater confidence in the newer system before a decentralized approach could be rolled out effectively. There is also limited scope to enable system administration to move outside the Statistics Unit.

Capacity in the Statistics Unit

The emphasis should be on maintaining and improving expertise *within* the Statistics Unit, ensuring that the capacity of this unit reflects the critical importance of maintenance of KEMIS, yearly conduct of the School Survey, production of the Digest and effective and efficient support for information requests.

Within the MoE, evidence suggests that the Statistics Unit has sufficient expertise in system administration, data entry and extraction, and in the general use of the KEMIS. The review team met with only the Manager of the Statistics Unit, not with other members of staff in the unit. The Manager of the Statistics Unit is competent in the administration and use of KEMIS. TA would however still be required for significant technical changes.

Other members of staff in the Statistics Unit are likely to be competent in the input and extraction of data, but we have not been in a position to ascertain current skill levels. To improve sustainability it is important that multiple Statistics Unit staff retain or acquire the ability to support KEMIS information requests, perform basic and advanced KEMIS management tasks, and provide data analysis training relating to KEMIS outputs.

Considerable system administration training would be required should the current Manager of the Statistics Unit leave the position. In this regard, the knowledge and expertise of the Manager of the Statistics Unit is paramount to ongoing sustainability of KEMIS, certainly in the short-term, and needs to be shared more.

A small number of MoE staff already access KEMIS relatively independently, e.g. in the Facilities Unit. This capacity can gradually be expanded as a picture of needs emerges via Statistics Unit staff members, who are in the best position to identify repeat/frequent users, their information needs and training requirements.

A key component of any human resource management is training. In 2009, UniQuest provided some training to the MoE in the use of KEMIS, and in analysing data more broadly. Reliance on external technical assistance for training is insufficient, unless training is regular and on-going. The review team is aware of significant documentation related to KEMIS, including a 500 page User Manual, but there needs to be a more specific and targeted training manual and quick-start guide. The guide could also cover the basics of importance of statistics, safe computer practices, and data analysis. The training manual would need to consider the way in which potential users have access to KEMIS and to the Digest, and what their likely data use will be. A

dedicated and specific training manual would also help starters within the Statistics Unit to gain a certain level of competence without the need for intensive TA, or significant delay in being able to use KEMIS.

KEMIS Effectiveness, Efficiency, and Sustainability

At the present time, KEMIS is meeting the requirements of the Kiribati MoE. The Statistics Unit is becoming more confident with KEMIS based on a SQL Server database and has advised us that their preference is to establish the current system firmly within the MoE, enhance awareness and use, and ensure a quality Digest before looking at further system enhancements. The evidence from meetings and discussions in Kiribati confirms that this is a sensible position to take.

In the short to medium term, KEMIS appears sustainable with external support in the area of (i) technical system / system development expertise, (ii) training to maintain, improve and share more widely expertise *within* the Statistics Unit, and (iii) some support for development of reusable KEMIS documentation, specifically a training manual and quick start guide. The section on Human resource implications provided more information on capacity of the Statistics Unit in relation to KEMIS operation, support and sustainability.

Awareness and communication

The effectiveness and efficiency of KEMIS can be improved with greater use and awareness. There is some evidence that suggests that the level of *formal* communication within the MoE and between government agencies could be improved to enhance the awareness and flow of education-related data. A number of government agencies use data from KEMIS but also collect education-related data themselves. There is information related to education held at the Ministry of Finance and Economic Development, Ministry of Internal and Social Affairs, Ministry of Labour, and at the Public Service Office. While this lack of formal government information sharing and co-ordination is not unique to Kiribati, there might be opportunities to improve information efficiencies by examining the different data sets and data repositories (many are still in paper format) and seeing how they may integrate or network more systematically with KEMIS.

A crude but workable *informal* communication system exists that does provide access to information extracts and products on demand, provided that the person knows where to go or who to ask for the information. At this stage, the need for more systematic and formal collection of this disparate data within the GoK context does not appear urgent or high. We don't think that KEMIS is the type of system to use over any other to develop into a system for more comprehensive information sharing across GoK agencies. But KEMIS, capable of exporting data in a range of standardized formats, could be effective as one of the repositories in a scenario where GoK would move towards a more formalized way of sharing and exchanging data and information.

Training and Capacity Development in the wider MoE

In a country with limited experience with computers and statistical data capture and analysis, training will remain an ongoing requirement. Training could be conducted in-house (delivered by the Statistics Unit) with the aid of a dedicated training manual and quick-start guide as referred to earlier.

There are a few examples of direct use of the KEMIS outside the Statistics Unit. The Facilities Management Unit had received training for KEMIS and we were told can use the system. KEMIS is accessible direct from a desktop in the Unit and is used for planning. There is some scope for further discussion around desktop access to KEMIS by MoE staff, and this can steer the focus of the proposed training manual and/or quick-start guide.

The PINEAPPLES software

Without having had opportunity to conduct a full review of the KEMIS functionality provided by PINEAPPLES, the review team can only comment on what was observed at the Kiribati Statistical Unit (MoE), and on systems documentation made available to us¹¹. KEMIS appears to provide a satisfactory interface, with functionality to ingest and retrieve data from the School Survey, and more recently from the exams unit. Excel pivot table based outputs add a significant level of flexibility to the many reporting options in the system and allow for alternative data presentations, exploration of statistical relationships and drilling down to micro-data level.

There is scope to add functionality to the system, albeit the more complicated the system becomes, the more likely the need for technical assistance. We have argued under 'Effective functioning of the KEMIS' that adding functionality or data sources to the system is not a priority: the current system functionality and data already provides scope for more, better and more effective use. Consequently, our recommendations seek to remove or reduce identified inhibiting factors and barriers to KEMIS use and sustainability.

We note however, functionality developed for PINEAPPLES in one country is easy to add to the PINEAPPLES-based systems in other countries. Regional co-operation and sharing or a PINEAPPLES user group as mentioned earlier could provide a basis for knowledge exchange, a discussion platform, and lever capacity and support to develop initiatives jointly rather than individually. For the GoK, MoE and partners, this can provide additional opportunities to share expertise, resources and costs associated with support for KEMIS.

External support

The review team understands that the level of external support for KEMIS has been satisfactory. The team has found UniQuest to be open in all our discussions, helpful in providing documentation and assistance in a timely manner, and open to discussing potential improvements in the system.

It is likely that external support will be necessary into the future. A significant component of this support will probably be technical system and system development support. The Statistics Unit can conceivably become and remain fully (or near) self-sufficient in operation of KEMIS and in provision of support to users through reporting, data analysis and end-user training. This should really be expected from the unit. But it is not equipped to develop, change, or provide advanced support for the PINEAPPLES software components. It is not realistic to expect the Statistics Unit, the MoE or even the GoK to develop this capacity.

We emphasise again that, with technical changes to KEMIS continuing to require external assistance, the ownership and licensing situation for the software needs to be clarified. The owners of the PINEAPPLES software need to take control and at the very least have a master copy of the software. Mechanisms need to be agreed for secure and systematic back-up of KEMIS data on properly controlled and managed systems.

¹¹ Options for a detailed software review were discussed with UniQuest, and permission was granted for to the AusAID representative to install the software. This was not pursued due to concerns about installation on AusAID computers.

Annexes

1. Mapping of types of data collected by the ministry and systems/software used (where known)

Statistics Unit: KEMIS.

Holds data from School Survey on:

- School funding, management and structure
- Enrolment data
- Buildings and rooms
- School facilities (site, rubbish collection, water supply, toilets, teacher housing etc)
- School resources (communication, equipment, power, library)

Also contains partial examination data from 2009 (export/import from Atlas)

Beyond KEMIS:

Scholarships Unit: **Scholar** system – administration of scholarship data / awards and processes

Examination Unit: **Atlas** system to record Examination data. Allows partial export to KEMIS, but full export may require further work. KEMIS contains a (partial) import from Atlas for 2009.

Facilities Management Unit – specific **extensions to KEMIS** to support simple costings.

LEPP data (Language Education Pilot Project) from 2009/2010 – data on teachers' (and students) English Language Proficiency. The system / format in which this held and captured is unknown.

Child Friendly Schools: for 2010 UNICEF has planned a Child Friendly Schools baseline survey (planned for sample of primary schools 2010). It is not clear if the resulting data will (also) be kept on MoE systems.

2. Range of KEMIS products and reporting

MoE

Identified regular reporting requirements of the MoE, supported by KEMIS, appears to be limited to 2 major products:

- The Digest (annually) – provided to all Ministers and relevant people inside the MoE. Made available, but on request, to other government agencies, the Kiribati Institute of Technology, the Kiribati Teachers' College, and UNICEF
- EFA reports to UNICEF ¹²

Other regularly produced products are:

- The annual School Survey
- The School Feedback / School Profile report which (according to the Statistics Unit) is provided to all schools which have returned the survey form

KEMIS supports a range of standardised reports, which can be provided *ad hoc*, including:

- Indicator reports (including a range of EFA reports Including scorecard, but also separate enrolment, intake, pupil/teacher ratios etc)
- Survey review report
- Principals' Comments report
- School Profile report

In addition an even wider range of queries is supported through Excel 'analysis workbooks' which can be customised.

Some *Examples of Ad hoc* reporting requests supported by KEMIS include:

- Requests for information are made by e.g. the Kiribati Parliament, other government agencies, and external stakeholders such as UNICEF
- The National Statistics Office uses education data from KEMIS to correlate and triangulate with Census education data.
- The Digest was used for planning and reporting purposes by the former Director of Education at the MoE, the Department of Finance (number of teachers), Kiribati Teachers' College (trained and untrained teachers), and at the Kiribati Institute of Technology (analysis of student numbers and exam results).

School based

- Through the annual School Survey for Primary, Junior Secondary and Senior Secondary (data is recorded in KEMIS):
- School funding, management and structure
- Enrolment data
- Buildings and rooms

¹² We understand that in practice these reports are generated on demand

- School facilities (site, rubbish collection, water supply, toilets, teacher housing etc)
- School resources (communication, equipment, power, library)

Information on Attendance and Annual Leave (provided to MoE and MFED) – this is not recorded in KEMIS, but KEMIS appears to have the functionality to record and analyse attendance data.

3. Stakeholders/audience/users of educational information

MoE – wide range of current and potential uses in e.g. Facilities Management, Scholarships Unit, Examinations Unit and 'upward' reporting for MoE planning, informing the Secretary

Primary, Junior Secondary and Secondary Schools – potential users, through feedback reports from KEMIS (if received)

GoK (all agencies) including notably MFED (including the Republic Statistician), PSO, and MISA – typically information is provided 'on demand'

KIT – principal showed clearly how he used the annual digest to support his planning processes (e.g. around intake and age of students)

Kiribati parliament - ad hoc requests

Development partners (including AusAID, NZAid, UN-family organizations including UNESCO and UNICEF): for Monitoring of progression against indicators (EFA), to plan interventions, to analyse patterns and trends and direct resources.

4. Extract from Terms of Reference for KEMIS review

Review Objectives

The **purpose of the review** is to:

- Assess the degree to which a sustainable KEMIS has been established.
- Assess the degree that the KEMIS is used by the Ministry of Education (in its core functions: planning, management and monitoring functions) and by other stakeholders.
- If necessary, make recommendations for specific actions that will better ensure that the KEMIS provide high quality reliable contributions to (i) sector performance reporting, (ii) core MoE functions, and (iii) the data and information needs of sector stakeholders.

Questions that the review is expected to address include:

1. To what extent has the KEMIS enabled the MoE to coordinate and regularly complete the timely collection and analysis of education system performance data?
2. To what extent is the MoE capable of preparing and disseminating accurate system data, to what extent is data verified for accuracy, and to what extent is system data analysed and provided to Ministry of Education policymakers and planners as user-friendly information and analytical reports?
3. To what extent are the various offices of the MoE (and other government agencies and donors) regularly (or intermittently) provided current valid system data/information by MoE (including data/information to inform education planning, management and budgeting)?
4. To what extent are the various products of the KEMIS used by the MoE, other government agencies and stakeholders? And, is there evidence that KEMIS related products are being optimized within the government?
5. In respect to the findings from 1 to 4 above, to what extent is the KEMIS functioning effectively? And, if the KEMIS is not functioning effectively, what are the reasons for this, and how best can these challenges be addressed (bearing in mind context and reasonable cost qualifiers)?
6. To what extent has the data in PINEAPPLE been shared within government agencies, and among international stakeholders such as UNICEF and UNESCO? Is there scope to share this information more widely, including within the public domain? Are there issues, costs associated with sharing the data/information produced by the KEMIS?
7. What have been human resource implications of KEMIS and to what extent have human resources impacted on the success or otherwise of the KEMIS project? (Identify the causes of the high staff turnover rate within MoE (and Statistics Unit) and how this affects the use and effectiveness of KEMIS. Comment on the preferred staff composition of the KEMIS unit (bearing in mind the particular challenges of Kiribati).

The Review will also consider and advise on the following **Issues**.

Effectiveness of external services Assess the degree to which external support for KEMIS has achieved the objective of establishing a relevant, user-friendly and effective education management information system in Kiribati.

Cost-Effectiveness and Efficiency Assess the extent to which inputs in support of KEMIS have represented value-for-money, including the targeting of technical assistance, capacity development and infrastructure.

Identify how links can be made between the support provided by UNESCO and its partners by way of capacity building and technical assistance to develop the M&E framework for the Kiribati Education Strategy, especially for the period 2009 to 2012 and KEIP's provision of TA to identify performance indicators with the KEMIS and ensuring that data in KEMIS are aligned to indicators in order to identify data gaps.

Sustainability Assess the extent to which the functionality and applied use of KEMIS/PINEAPPLE is likely to be sustained in the absence of external support. Identify the key challenges and opportunities affecting KEMIS sustainability.

Recommendations

Broadly speaking, the review's recommendations are expected to focus on the current effectiveness of the KEMIS as a management tool and how that effectiveness can be improved. Recommendations are expected to address KEMIS functionality and utility as well as interest in the relevant government offices and elsewhere in KEMIS products (actual and potential). It will also be useful if both the resource implications and risks associated with the recommendations made are discussed.

Recommendations should support: (i) Government ownership of KEMIS, (ii) cost-effectiveness, (iii) system efficiency and user-friendliness; (iv) existing MoE management structure and any planned change in that structure; (v) long term sustainability.

5. KEMIS review schedule

Date	Time	Program	Venue/Comments
Tuesday 11 May	2 days	Travel (TA)	UK
Wednesday 12 May		Travel (TA)	UK
Thursday 13 May	1 day	Travel - Desk Review (TA)	UK-Australia
Friday 14 May	2pm (BNE time)	Meet with Ms Rebecca Sprat, UNIQUEST Education Manager, UNIQUEST, Brisbane (TA & AusAID rep)	BNE, Australia
Saturday 15 May		Desk review (TA)	BNE, Australia
Sunday 16 May	9pm	Travel from Brisbane to Tarawa (via Honiara and Nauru) on <i>Our Airline</i> (TA and AusAID rep)	Australia - Tarawa
Monday 17 May	7am	Arrive Tarawa, (Bonriki International Airport)	Travel to Mary's Motel, Bairiki
	3pm	Meeting with Kiribati counterpart, Mrs Maria-Teretia Kaiboia	Mary's Motel
Tuesday 18 May	8:30am – 10am	Meet with Mr Wes Knight, Acting Australian High Commissioner and Adeola Capel, Senior Program Manager, Education	Australian High Commission, Bairiki
	11am-12noon	Meet with Ms Karabi Tiaeki, Director of Education, Ministry of Education (MoE) who will be Acting Officer in Charge (OIC) while Secretary is away.	MoE, Bikenibeu
	12:05pm-12:40pm	Meet with Mr Natario Kiati, Deputy Secretary, MoE	MoE, Bikenibeu

Date	Time	Program	Venue/Comments
	12:40pm – 1:40pm	LUNCH	Please note: No arrangements have been made for daily lunches. (suggestions: Bikenibeu Chinese restaurant or Otintaai Hotel)
	1:45pm – 2:45pm	Meet with Mr Kinta Eram, Senior Statistician (c)	Statistics Unit, MoE (28091)
	2:50pm – 3:40pm	Meet with Mr Ataake Tekanene, Facilities Manager	Facilities Maintenance Unit (FMU), MoE
	3:40- 4:15pm	Meet with Ms Tokaua Tekabu, Scholarship Officer	Scholarship Unit, MoE (28091)
Wednesday 19 May	9am – 10:00am	Visit Principal, Mr Raitere, Betio Junior Secondary School	Betio, Tarawa (26656)
	10:40am – 11:20am	Meet with Brother Siaoti Ioane, Principal, St Louis High School (c)	Teaoraereke (21441, 22284)
	12:05pm – 12:45pm	Visit Ms Kaaro Metai, Deputy Principal, King George V and Elaine Bernacchi Senior Secondary School (c)	Bikenibeu, Tarawa (28157)
	12:50pm – 1:35pm	LUNCH	(suggestions: Otintaai Hotel (place order early) /or Saban)
	2 pm – 3:30pm	Visit Head Teacher, Ms Bwaureti Taaboru, Aratokotoko primary school (c)	Buota (rep. of 'rural' primary schools - 28361)
Thursday 20 May	9am – 10am	Meet with Bintonga Even, Deputy Secretary, Ministry of Finance and Economic Development (MFED) and Tiimi Kaiekieki, Director of Planning (MFED) (c)	MFED, Bairiki (21802 PA: Mariina)

Date	Time	Program	Venue/Comments
	11:10am – 12:10pm	Meet with Deputy Secretary, Mr Tom Murdoch, Ministry Of Internal and Social Affairs (c)	MISA, Bairiki (21092 PA Euselle)
	12:15pm – 1:30pm	LUNCH	Sugg: Taotin restaurant (Chandeliers), Bairiki
	1:45pm – 2:45pm	Meet with Secretary, Ms Wiriki Tooma, Public Service Office (PSO) (c)	PSO, Bairiki (21564 ask for PA)
	3pm – 4pm	Meet with Republic Statistician, Mr Tekena Tiirua (c) and Mr. Tooma Tehumu, Director of Human Resources	MFED, Bairiki (21813)
Friday 21 May	8:30 – 9:45am	Meet with Mr Kevin Downie, Principal, Kiribati Institute of Technology (c)	Betio, (26537)
	11am – 12:30pm	Teleconf with Brian Lewis (c) and Dorothy Jenner (c)	AusAID Program Office, Bairiki (21184)
	12:35pm – 1:35pm	LUNCH	
	3:30pm – 4:30pm	Debrief with Mr Wes Knight, A/G Australian High Commissioner and AusAID Education team.	Second Secretary's Office, Australian High Commission
Saturday 22 May		Draft report	
Sunday 23 May		Draft report/own time	
Monday 24 May	11:40am – 12:30pm	Meet with Mr Joao Mendes, A/G Chief of UNICEF Field Office and Joint Presence and Mrs Bwenaata Kienene, Education	UN Joint Presence Office, Teaoraereke

Date	Time	Program	Venue/Comments
		Officer, UNICEF	
	2pm – 3pm	Meet with Ms Taatita Tieta, Principal, Kiribati Teacher's College (KTC) (c)	KTC, Bikenibeu (28062)
	3:15pm – 4:15pm	Meet again with Mr Kinta Eram, Senior Statistician	MoE, Bikenibeu
Tuesday 25 May	1pm	Depart for airport	Bonriki, Tarawa
	4:10pm	Plane departs (<i>Air Pacific</i> to Fiji)	Tarawa - Fiji
Wednesday 26 May		Travel	Nadi - Australia
Thursday 27 May		Travel	Australia - UK

