A Guide to SANIVEY –
Assessing User Acceptance and Functioning of Mobile Communal Sanitation Facilities in Informal Settlements

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A Guide to SANIVEY – Assessing User Acceptance and Functioning of Mobile Communal Sanitation Facilities in Informal Settlements

Report to the
Water Research Commission

by

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on behalf of the

Community Water Supply and Sanitation Unit
Cape Peninsula University of Technology

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Preface

The provision of water and sanitation services to under privileged citizens is one South African Government development priority intended to meet the Millennium development goals target by 2015. In order to meet this target, several sanitation technologies (including mobile communal sanitation) have been developed and made available for choice; and to speed up the service delivery the choice of the types of sanitation technology should meet the user needs and expectation, should function adequately at all times and ensure user confidence.

Despite the speedy delivery of these basic services, it is estimated that 16 Million people living in South Africa (in 2012) do not have access to basic sanitation facilities or have no access to sanitation facilities whatsoever. Several sanitation technologies that are planned or being provided are found to be inadequate and not serving their intended purposes. The user acceptance of some of these technologies is as low in such a way that the provided sanitation systems are being torched, vandalized or sabotaged. In addition, the functioning of these sanitation systems is not evident from user perspectives. This situation creates a huge barrier between the municipalities and communities which, in most cases, result in violent protests, vandalism and destruction of other infrastructure.

With municipalities struggling to come up with mechanisms to eradicate the sanitation backlog through a speedy service delivery, research was conducted in partnership with three municipalities covering peri-urban and semi-rural informal settlements and covering a range of mobile communal sanitation facilities expressly to inform user acceptance and functioning of this new type of sanitation systems.

To ensure a high level of user acceptance and adequate functioning of the mobile communal sanitation facilities (MCSF) in informal settlements, a framework for assessing user acceptance and functioning of MCSF was developed (refer to WRC report 2017/1/12) from which an easy-to-use software called "**SANIVEY**" was developed to analyse results of the application of the framework.

 This report "**A Guide for Assessing User Acceptance and Functioning of Mobile Communal Sanitation Facilities in Informal Settlements**" outlines the stepwise application of the SANIVEY software and covers the following:

- ➢ Development of the SANIVEY software package which provides a rationale for the development of the SANIVEY software and its value;
- ➢ The software requirements covers the terms of use, installation and disclaimer;
- ➢ The context of application of the SANIVEY software package presents the context by which the SANIVEY can be applied;
- ➢ Case study examples of the application of the software package provide examples of the analyses obtained through the use of the SANIVEY at three case study sites.

Ultimately, the application of the SANIVEY will provide an easy analysis of the sanitation technologies by flagging up areas of concern of each stage of the sanitation cycle that requires attention.

Acknowledgments

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List of Acronyms

CoCT	City of Cape Town
CPUT	Cape Peninsula University of Technology
DWAF	Department of Water Affairs
IS	Informal Settlement
MCSF	Mobile Communal Sanitation Facility
M&E	Monitoring and Evaluation
SPSS	Statistic Package for Social Studies
Watsan	Water and Sanitation
WRC	Water Research Commission

1   Introduction

1.1 Development of the SANIVEY software package

The aim of this study was to assess the user acceptance and functioning of mobile communal sanitation facilities (MCSF) in informal settlements (IS) with the view to develop a framework for facilitating the assessment. The developed framework comprises three phases' namely planning, implementation and post-implementation. To each of these phases is attached a number of criteria and each criterion has number of indicators.

Following the development of the framework, an initial testing was undertaken in order to determine its usability. This was followed by a refinement of the framework that was further applied at three case study sites namely Kayamandi (Stellenbosch), Pooke se Bos (City of Cape Town) and Shembe – Inanda (eThekwini).

Responses from these interviews were captured, coded and analysed using the statistical package for the social sciences (SPSS) version 19). From the application of the SPSS, large volume of data was generated and made the analyses labour intensive. Hence, prompting the need to develop a simpler approach to codifying framework results which required separating the user acceptance and functioning framework in order to ease the data production.

The SANIVEY was developed in the line the developed framework using the questionnaire used during the interviews. The design of the SANIVEY enables users to capture information directly (by ticking relevant section according to the interviewee response) or indirectly by reporting information captured on site into the software.

The purpose of the SANIVEY software is to assist in the analysis of on-site survey data captured during interviews. This software was developed with the intention of analysing users' views and translating it into a judgment that can be used by decision makers for further actions.

The development of the SANIVEY was done bearing in mind that each phase of the framework has its own criteria and each criterion has its indicators. These indicators inform criterion and in turn criterion inform the phase. Indicators were assessed by asking questions to users. Responses expected were either yes, no or don't know or some questions had other respond choices where necessary (see section 3 of the report).

Note that with respect to the Functioning responses were only either yes, no or don't know; and this are further translated into adequate (referring to behaviour or attitude that contribute towards adequate functioning of the facility) or inadequate (referring to behaviour or attitude conducive to inadequate functioning of the facility.

1.2 The use of the SANIVEY

The SANIVEY software is to be used as an analytical tool with the intention to indicate the percentage of respondents that indicated either high or low acceptance (adequate or inadequate in the case of the Functioning Framework). The highest percentage value (i.e. high or low) of an indicator gets colour-coded in order to suggest whether that particular indicator need attention or not. Green reflects high level of acceptance (or adequate functioning for the Functioning Framework) and red reflects low level of acceptance (or inadequate functioning).

Although the percentage values of respondents way show for both high and low acceptance for each indicator. The mode across the criteria determines the colour-code of a phase. The flagged information highlights the problem areas that require attention. This tool will assist local authorities to understand the sanitation problem by responding to flagged issues that will ensure adequate functioning of the facilities.

It is therefore important that a data entry sheet is fixed so that the questions correspond to the relevant indicators and that the indicators correspond to the relevant criterion per phase of the framework.

The software provides for two way analysis namely:

> ➢ A grid view: an amalgamated report (covering results) that indicate the percentage of respondents who indicated either high or low (for user acceptance) and adequate or inadequate (for the functioning). The highest percentage value (i.e. between high or low – adequate or inadequate) of an indicator gets colour-coded in order to suggest whether that particular indicator need attention. Although the percentage values of respondents have to be shown for both high or low - or adequate/inadequate for each indicator.

> ➢ A tree view: that provides a direct view of the overall sanitation situation within the settlement using the phase of the framework (namely planning, implementation and post-implementation). Details of each phase may be obtained (if requested) by expanding the view to criterion and further to indicator. High or Low acceptance - adequate or inadequate functioning of the process are flagged by "thumb up" or "thumb down" views (for phase and criterion) while indicators are flagged by "green" or "red" colours.

Depending on the level of detail required, any one of the methods of analysis and views described above may be selected. The application of the SANIVEY is briefly explained in the following section. The objective of this manual is to serve as a practical application guide for user, municipal officials, decision makers and environmental practitioners who already have some previous training in social and technology assessment.

2. The guide for assessing users' acceptance and functioning of mobile sanitation

2.1 Overview of the software package

The *SANIVEY* software package is an assessment tool that was developed to assist decision makers, municipal officials and engineers to assess and get a view of the sanitation technologies provided to informal settlements with regard to the acceptance and functioning from user perspective.

Many questions related to user acceptance and functioning of the sanitation facility are to be answered in order to determine the level of acceptance and the extent of functioning. These includes for example:

- What is the status of the sanitation within the settlement prior and after the provision of the actual sanitation facility?
- Is the provided sanitation technology appropriate?
- Did user participate in the selection of the sanitation technology?
- Do users have knowledge of the type of sanitation technology provided?
- What are the operational requirements of the provided sanitation technology?
- Does the sanitation technology provided offer a development opportunity?
- What are the operation and maintenance tasks required to ensure adequate functioning of the facility?

The results obtained from the application of this software tool will provide an indication of the level of user acceptance and the extent of the functioning of the facility. It should be used cautiously as it provides only a simple indication by flagging issues that need attention.

Finally note that this software, developed on behalf of the Water Research Commission, is distributed at no cost in the public interest. Users are welcome to send suggestions for improvement of the software to the mail address cwss@cput.ac.za, and as time permits these suggestions will be attended to.

A user database will be kept and updates will be sent to all those who supply their contact details. However, users are welcome to customise their own versions of *SANIVEY* provided permission is given by the funder organisation and/ or the author. There is no password required to operate this software, however if any problem is encountered during its application, feel free to contact us.

For your convenience, an easy to use guide comprising the print screens of each stage is provided. This will guide you through the process from the start up until the submission of results and generation of the reports.

2.2 The software requirements

2.2.1   Installation of the SANIVEY software package

a) The software requires the following specifications
   * Windows 7 (64-bit) operating system
   * .Net Framework – comes with the SANIVEY installation software if required
   * Microsoft Access Driver (64-bit) – comes with the SANIVEY installation software if required

b) How to install

To install the SANIVEY software, you must follow the following steps:
   * Click the "setup" button to start the installation
   * See the installation guide (.htm) that comes with the setup

2.2.2   Troubleshooting

   ➢ I have the .NET Framework installed?
      -   Great! Then you don't need to install it in the setup.

   ➢ I don't have the .NET Framework?
      -   Ok. You will need to install it and will be prompted to do so during the setup process.

   ➢ I already have Microsoft Office 64-bit with Microsoft Access installed?
      -   Great! Then you don't need to install it in the setup.

   ➢ I have Microsoft Office 32-bit with Microsoft Access installed?
      -   You will first have to uninstall Microsoft Office 32-bit in the Control Panel->Add/Remove Programs. Then install the Microsoft Access 64-bit driver.

   ➢ I already have Microsoft Office 64-bit, but don't have Microsoft Access installed?
      -   Ok. You will need to install it in the setup.

   ➢ Is my anti-virus preventing the installation of the SANIVEY software?
      -   Yes that could a possible cause. If your pc has McAfee or some other anti-virus software, turn it off before you install the SANIVEY software. Then you can turn it back on again.
   ➢ I am unable to save the survey
      -   One of the possible causes is the write permissions settings of the user logged in. Another possible cause is not enough disk space on your computer's hard-drive.

   ➢ Who do I contact when I am lost and have tried everything suggested?
      -   Send an email to: cwss@cput.ac.za

2.2.3 Terms of use

The SANIVEY software is obtainable from:
Water Research Commission
Private bag X03
Gezina, 0031
Or Email us at: orders@wrc.org.za

Users are prohibited from doing the following:
- Decompile or disassemble the software without any permission from the authors;
- Make more copies of the software without prior permission from the authors;
- Publish the software for others to copy;
- Rent, lease or lend the software;
- Use the software for commercial software hosting services.

2.2.4 Disclaimer

This software package "SANIVEY" was developed by the Community Water Supply and Sanitation Unit (CWSS) of the Cape Peninsula University of Technology (CPUT) on behalf of the Water Research Commission (WRC).

The software is unlicensed and obtainable free of charge by simply emailing orders@wrc.org.za. Any modification, upgrade and manipulation should be done as per written consent/ or agreement of the CWSS or WRC. The software may be used only as per user guide provided and the CWSS or WRC are not responsible for any result of misuse or misinterpretation of results. Hence user must comply with any technical limitations in the software that only allow you to use it in certain ways.

2.3 *Running the SANIVEY software package*

This section briefly explains how to use the SANIVEY software. As any other software, the SANIVEY was developed to serve a particular purpose; its application was expected to ease and lessen the laborious task of data capturing in order to provide access to all user groups.

The SANIVEY software is symbolised by a black icon showing a standing person holding a book (survey) looking at a sanitation facility. When clicking on the icon, a computer screen consisting of a menu and help bar will appear.

To run the SANIVEY software, four main stages are required in order to obtain the final report. These steps include Starting up the software, Starting the survey, Adjustment of information and Generate report. In addition to this, the help button is installed to provide other information needed for better understanding of the software and its application.

The stepwise application guide of the SANIVEY software is as follows:

➢ Double click on the SANIVEY icon to start up the software

➢ The screen will appear showing the SANIVEY icon on the top below which the main menu and help are provided,

➢ Select main menu or help bar;
  - the main menu bar will lead you to the survey and,
  - the help bar will assist you with relevant information regarding the author, the product and the user manual),

➢ Using the main menu bar, information such as submit survey, generate report or exit application will appear
➢ The "submit survey" button will open the survey
➢ The "generate report" button will generate a report of an existing or captured survey
➢ "Exit the application" is used to close the opened survey

➢ The submit report will lead you to the preparation of the survey; and to start the survey:
➢ Select the type of survey "user acceptance" or "functioning"
➢ Choose (from the dropdown menu) or add a case study site. Select or add the case study site: if there is a predefined site, you may immediately retrieve it.
➢ In most cases, you will have to select you own case study by clicking the button "add case study site"; then type the name of the selected site and save;
➢ Once the case study is added, the date during which it was created will appear in bracket,
➢ Click on "reset" to check or adjust the date you started the survey
➢ Click "cancel" to terminate the survey

➢ Select "begin survey": when selecting this feature, a survey questionnaire will be displayed.

➢ The survey questionnaire consists of question number, questions and three answer boxes that indicate "Yes", "No" and "don't know".
➢ You can use directly the survey questionnaire to capture interview or load captured interview from a spreadsheet.
➢ The interview is captured by pointing/clicking the right box corresponding to the respondent answer;

➢ When all questions and answers are completed and captured, click "save survey" on the icon placed at the top or bottom of the questionnaire.

➢ You may save or cancel the survey when necessary, by clicking the button "save" or "cancel";

➢ Once the survey submitted, the next phase is to generate the report; this is done by returning to the main menu bar:

- Click the main menu bar
- Select "generate report" button
- Select "type of report" related to the survey conducted
- "Choose the case study site" that was used to capture information
- Select the "start" and "end" date
- Click "generate report" to get the report of the conducted survey
- Click "reset" if want to adjust the date, change case study site or the type of report

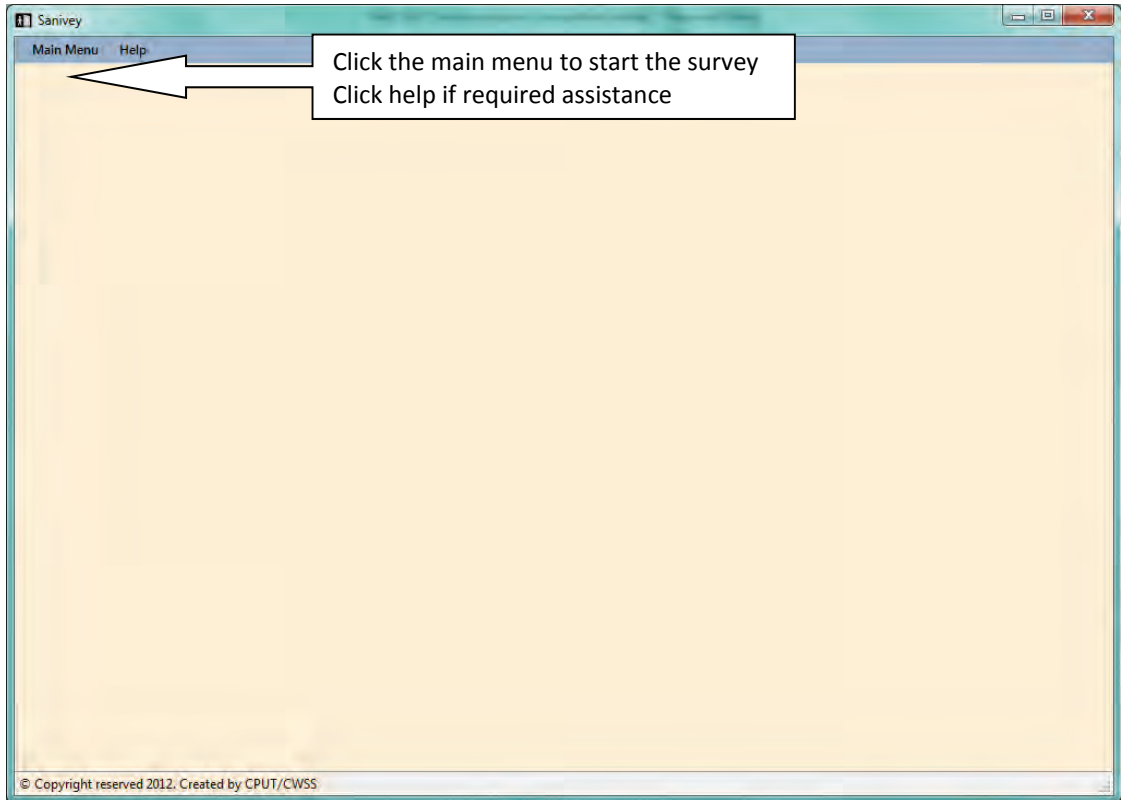These steps are illustrated below

2.3.1 Start up

To start the SANIVEY programme the following steps are to be followed:

➢ Click on the SANIVEY icon,
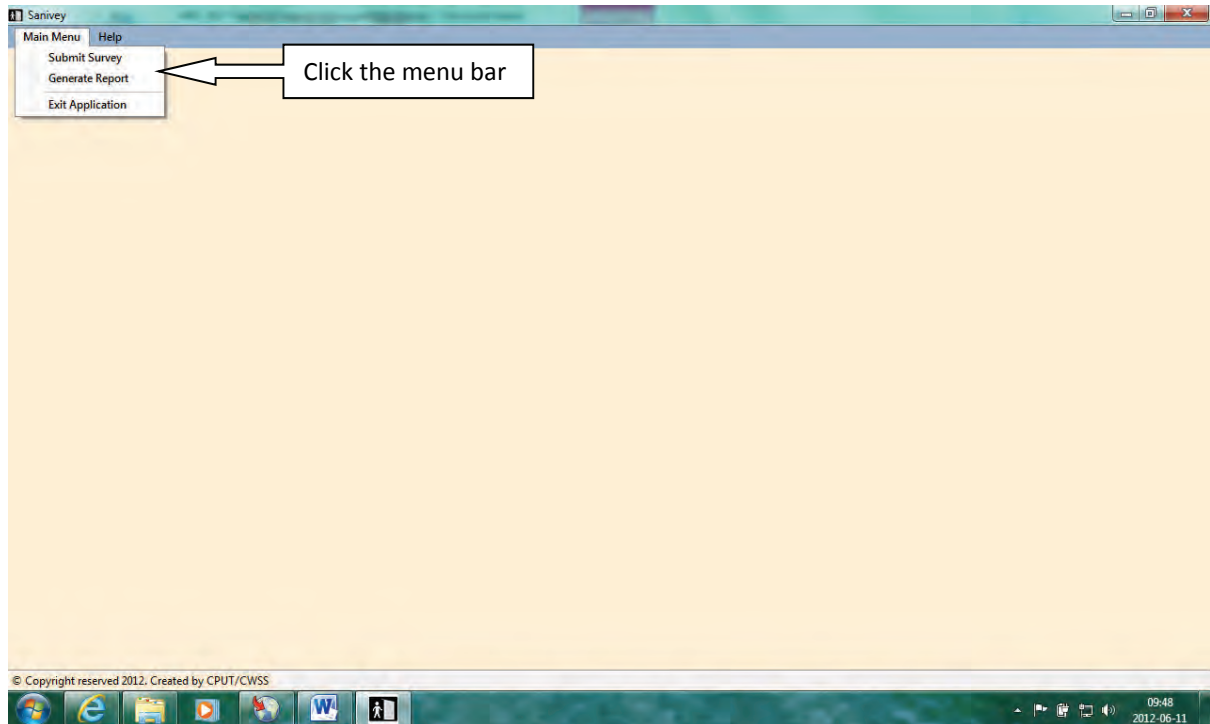➢ An opening window illustrated below will be displayed

➢ A screen show with "main menu" and "help" will be displayed

Click the main menu to start the survey
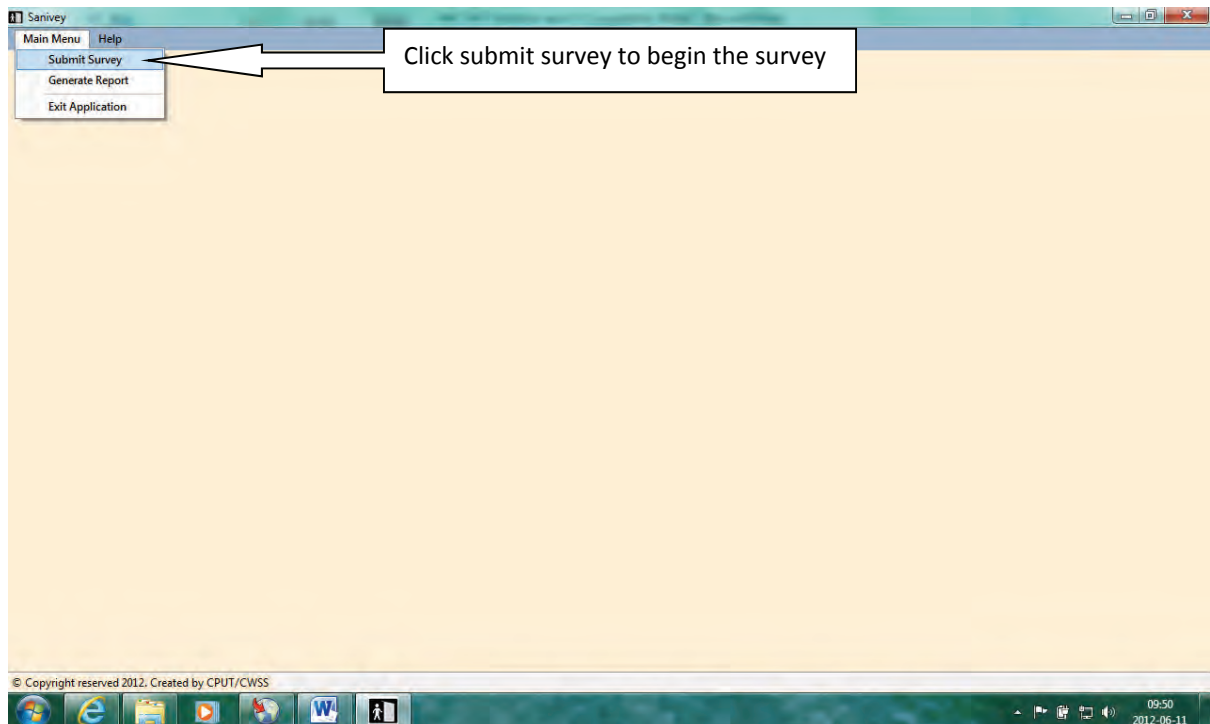Click help if required assistance
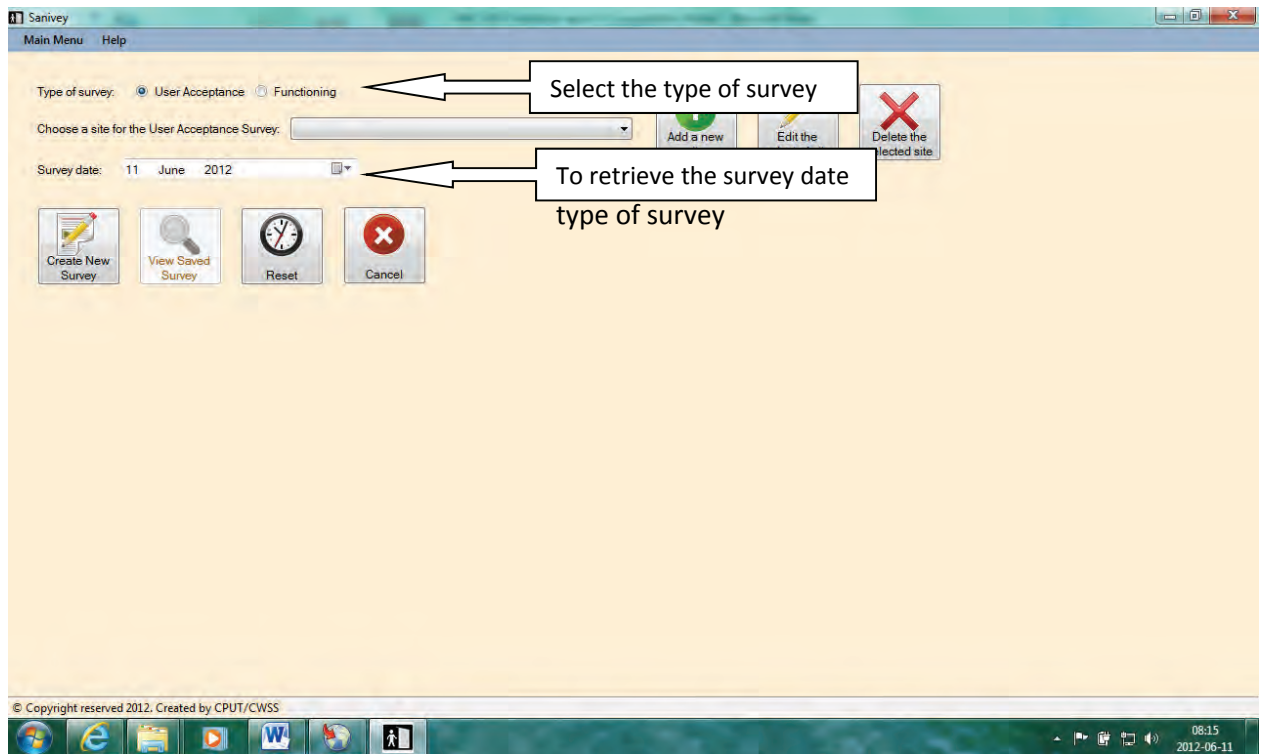
2.3.2   Starting the survey

➢ Click the "main menu" bar: a drop down menu with mention "submit survey", "generate report" and "exit application" will appear

➢ Click "submit survey" to start a survey

➢ The following screen show will appear

- To start a survey, you must select the type of survey by clicking "user acceptance" or "functioning" button,
- Select the survey date

- Choose a case study site (for user acceptance or functioning) if case study sites were already defined,
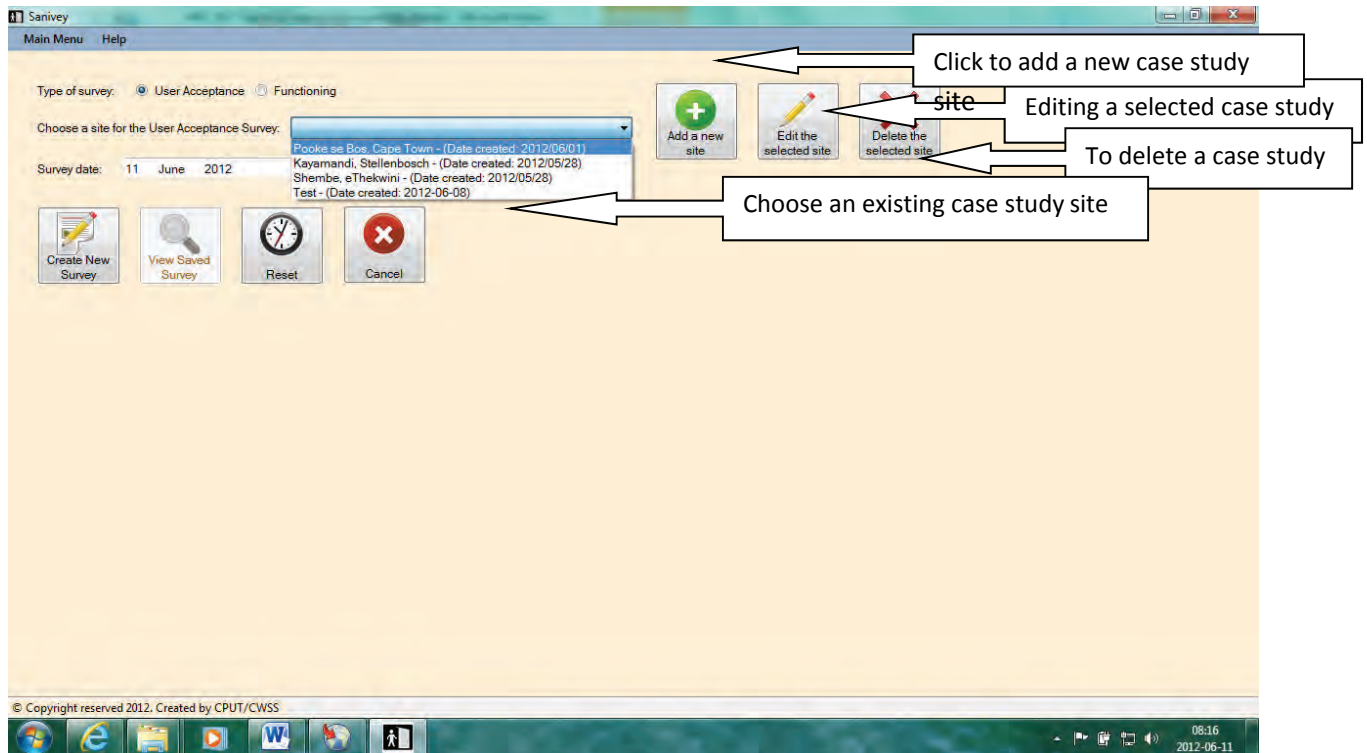
- If selecting an existing case study site, the name of the site and the date it was created will appear on the menu.
- When adding a new case study site, the date this site was added will appear automatically.

- If decided to delete an exisiting case study (which data has been captured), you will lose all data
  - Click "delete the selected case study site"
  - The dialogue box indicating the type of survey and delete a site will appear
  - Choose "yes" to confirm that you want to delete or "no" to cancel the action

To delete a selected case study site

To confirm or cancel the action
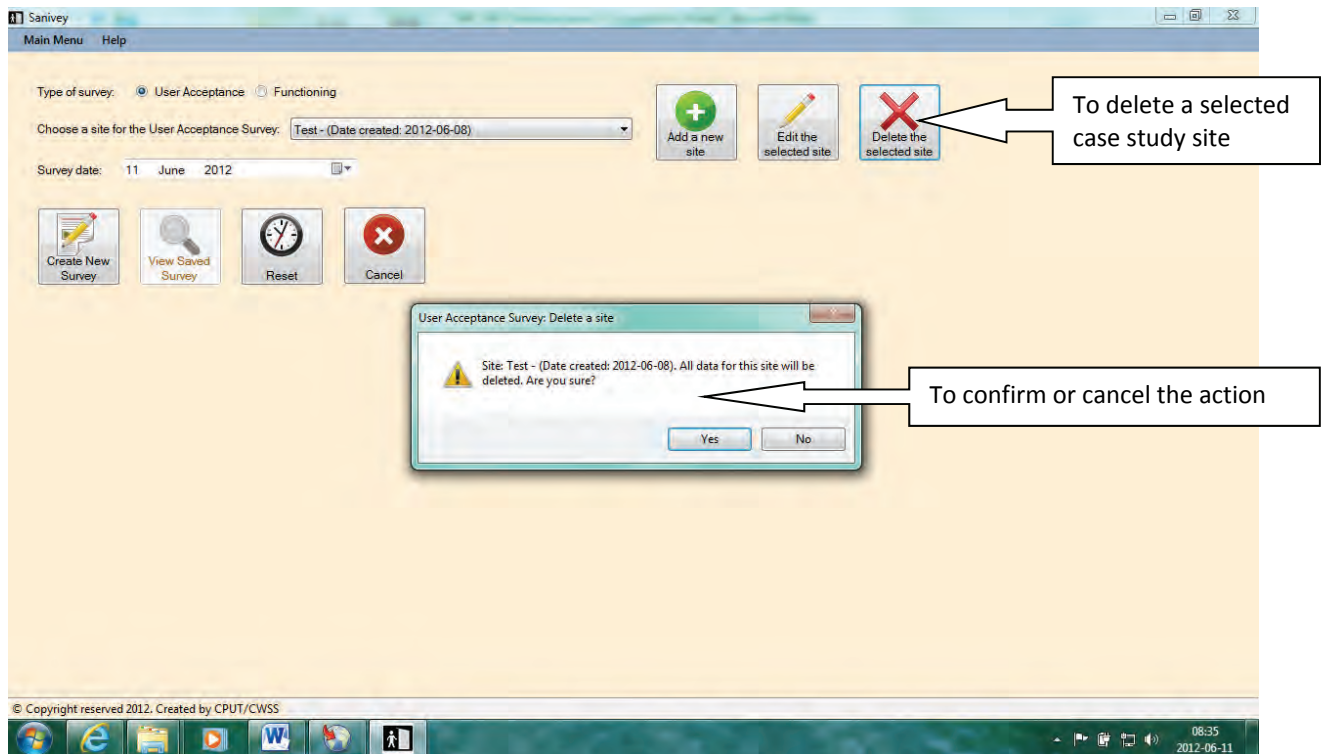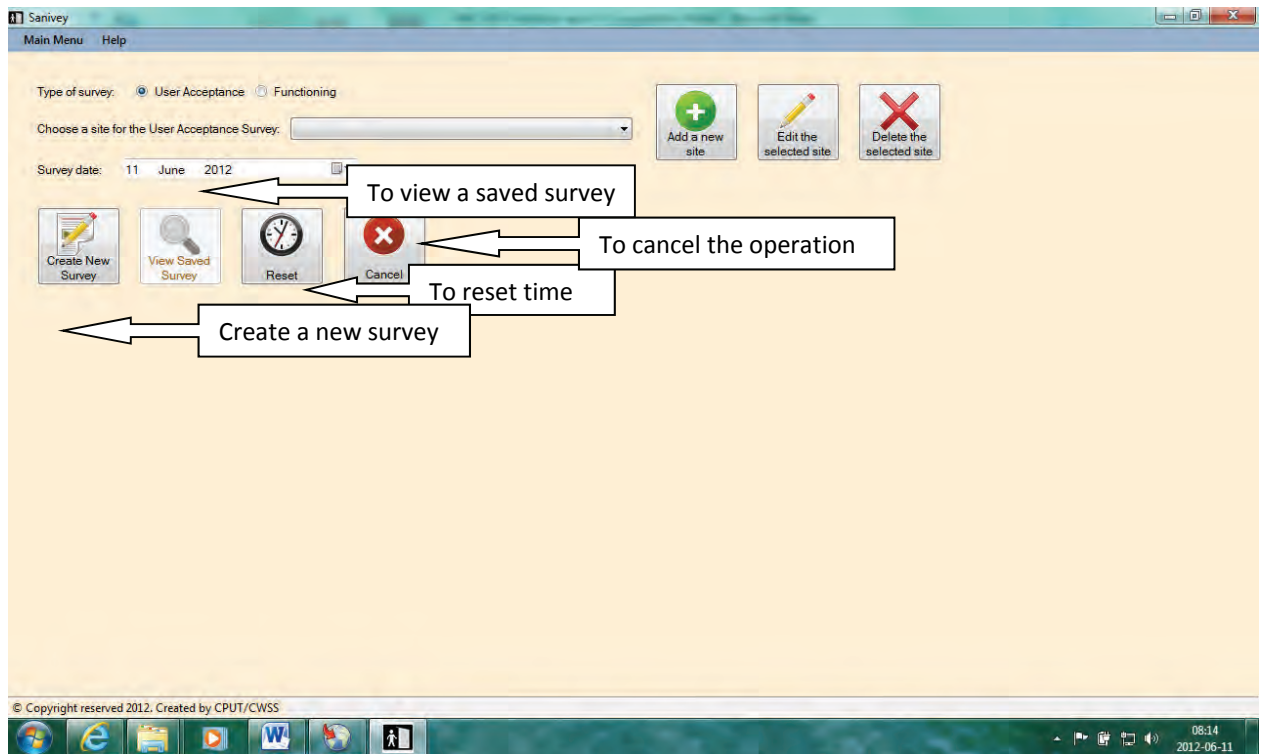
- If the case study sites are not pre-defined, select the button "add a new site" to name a case study site,

- Type the name of the new case study and click "save" button
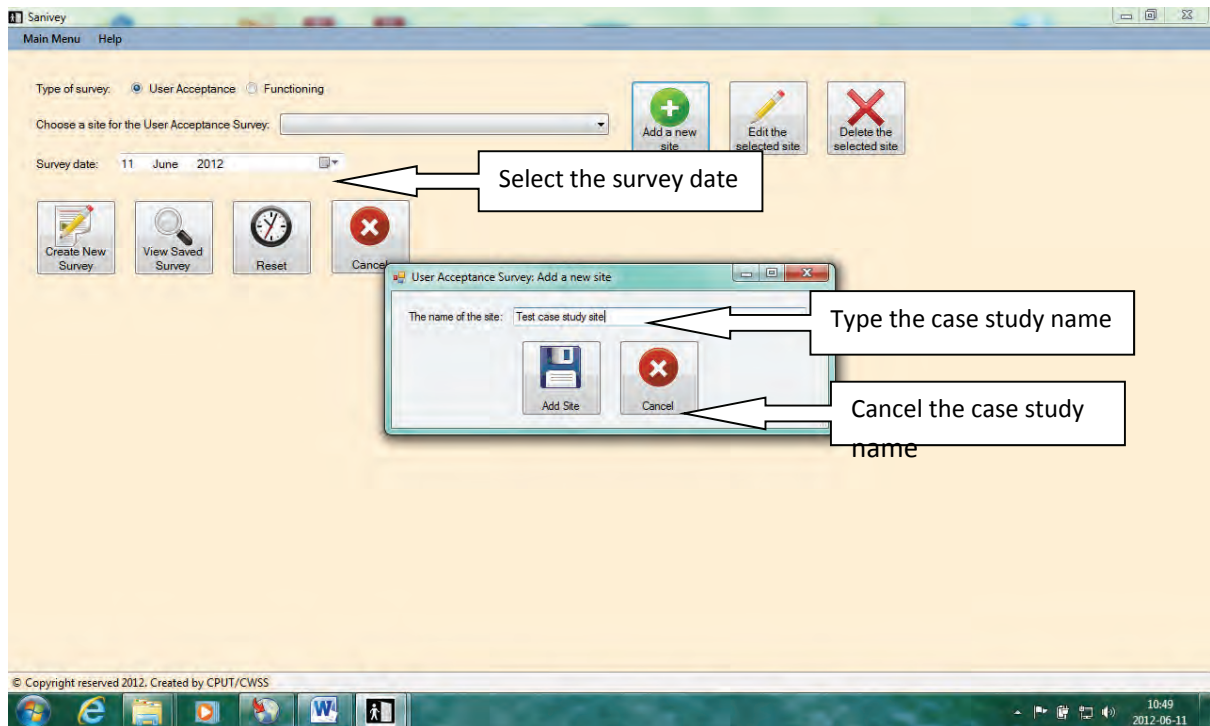
- Select "the survey date" from the calendar provided by scrolling the button ,
- You can reset the survey day by using the button "reset" or
- Cancel the everything by clicking the button "cancel"

➢ Click "begin the survey" to start the survey and the following window will appear
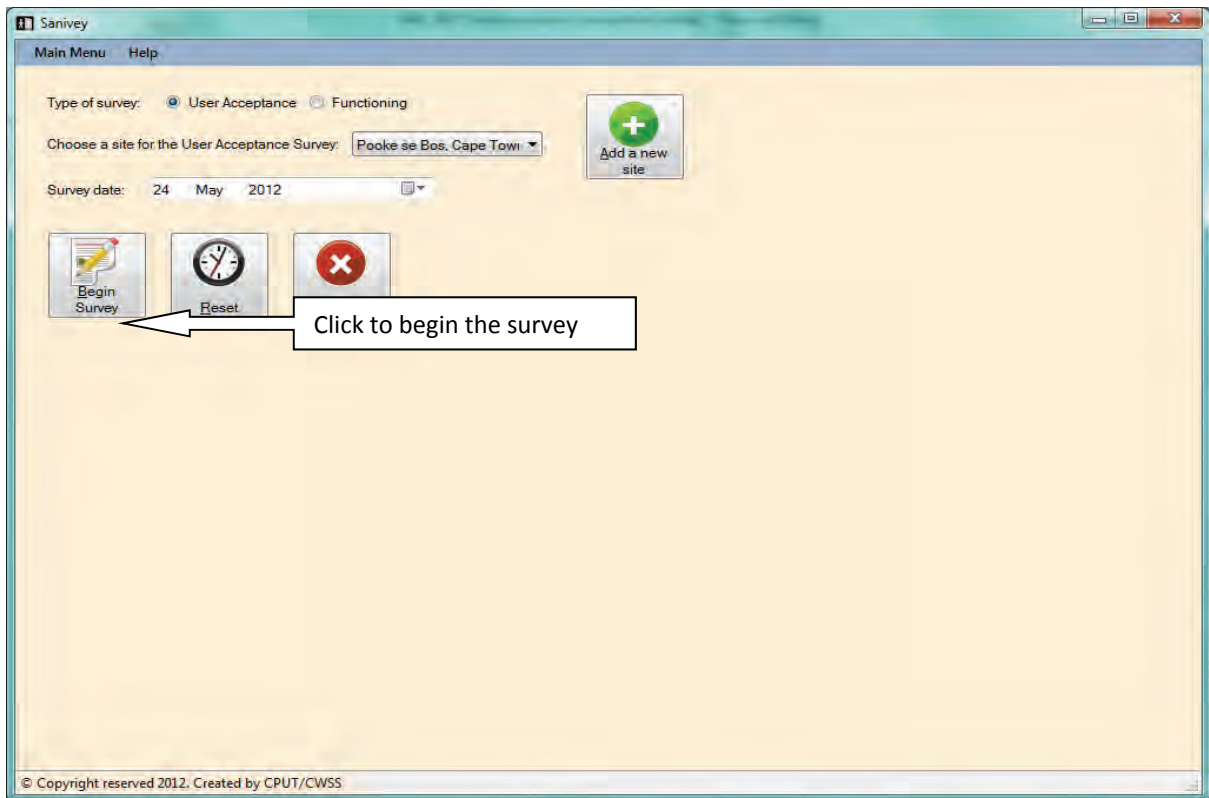
➢ From this window, tick "yes" or "no" answer

- Fill all sections and the page will look as shown below. The selected answer will appear blue; and the second answer will not be activated.

- ➢ After filling all sections of the survey click

- ➢ "Submit" button to submit the survey or

- ➢ "Cancel" button to cancel the survey as indicated in the following window
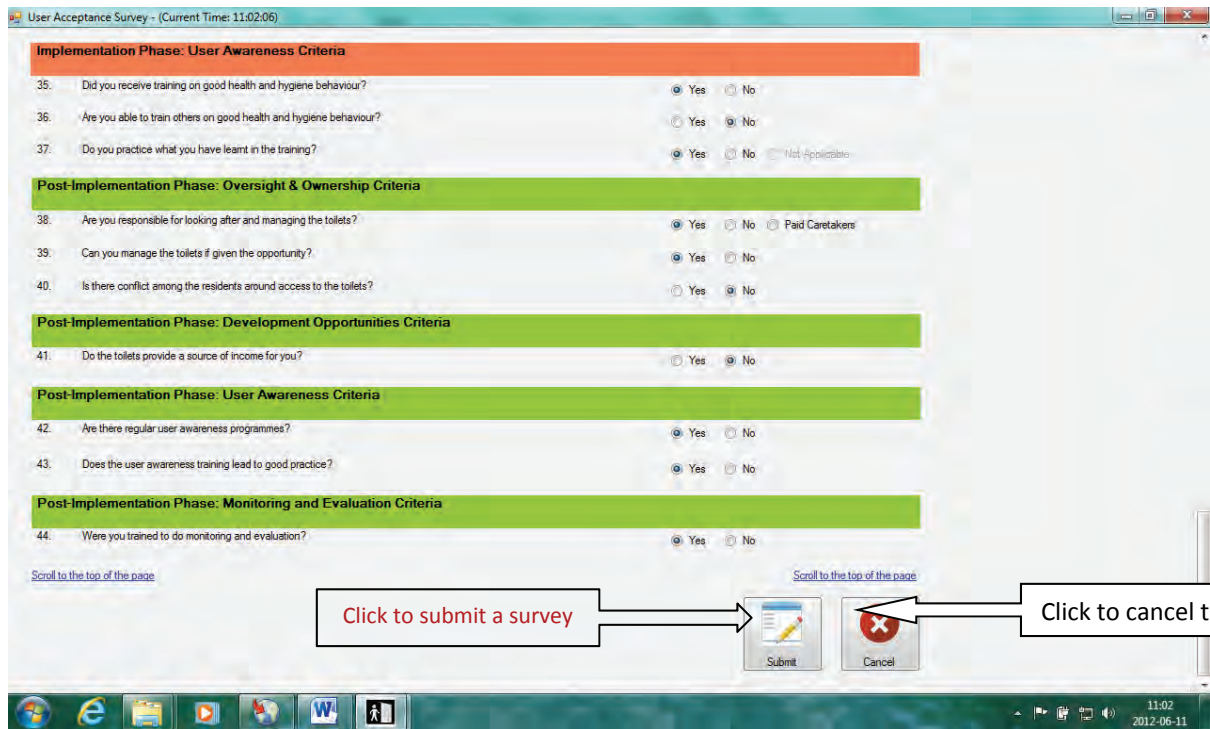
Note: the "submit" and "cancel" buttons are provided both on top and bottom of the page. You can scroll to the top of the page to submit or cancel by clicking on the blue print above the "submit" and "cancel" icon.

Remember to ensure that all questions are answered prior to submitting, failing to provide an answer to any of the questions the report will not be generated. The illustration is provided below.

➢ If one of the questions has not been selected, an indication showing "some of items have not been selected" will appear as shown in the page below. This will disappear only if spotted items are selected.
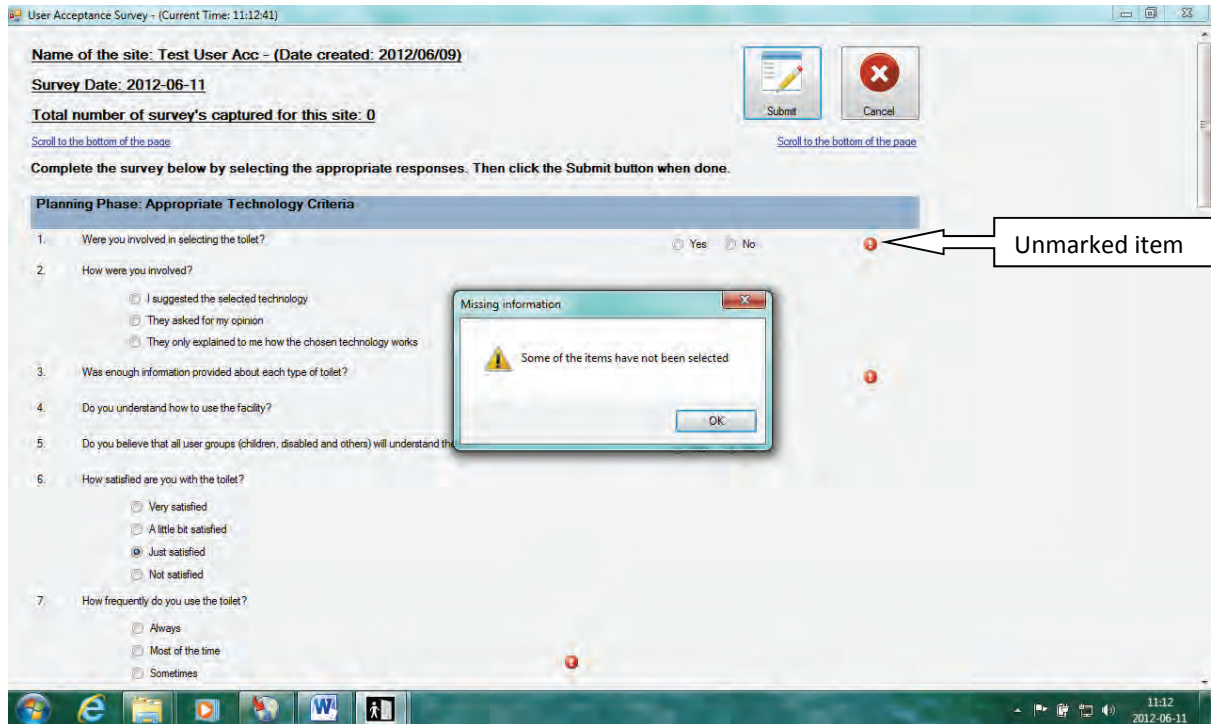
2.3.3   Adjustment of captured information

➢ Once the "Submit" button is pressed, the following page will appear; and click Ok to confirm. After the page will disappear
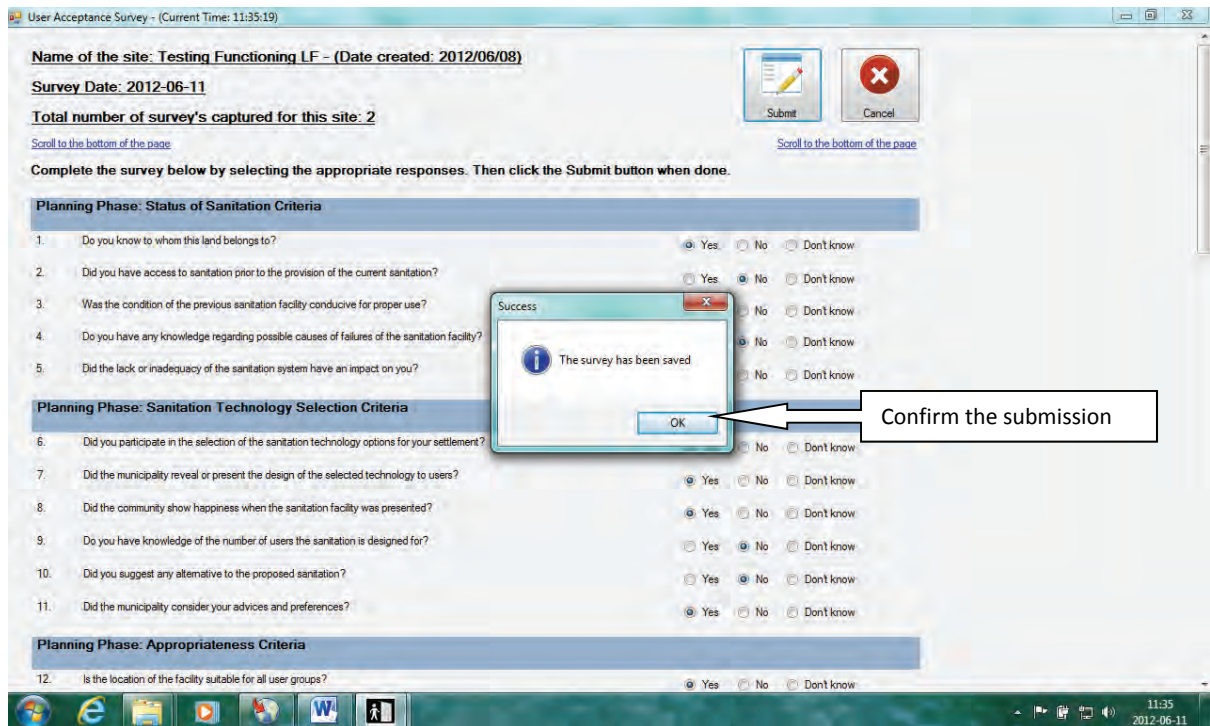
➢ If you want to see the survey that was captured, click "view saved survey" button
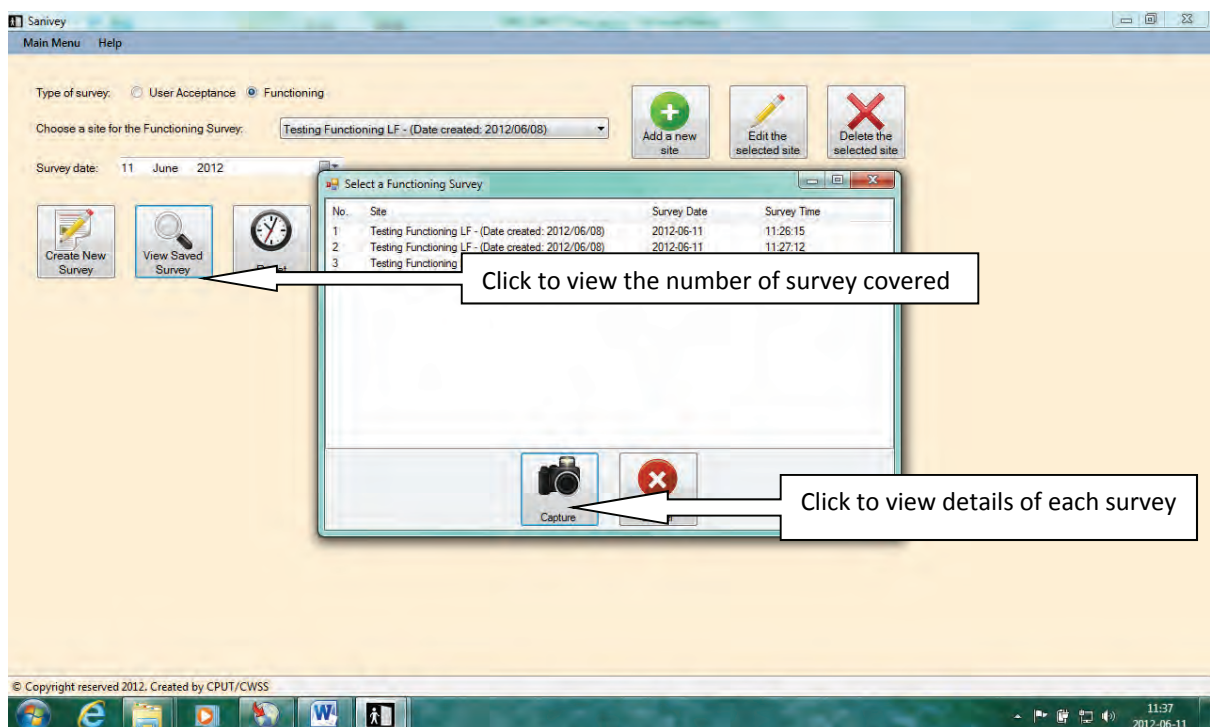
➤ You can select the survey you want to view or edit according to the date and time by clicking the "capture" button; and the initial survey will appear as shown below:

- You can remove the survey from the list by clicking "delete survey"

Click to delete the survey

- You can edit the survey by clicking "update survey"

Click to update the survey
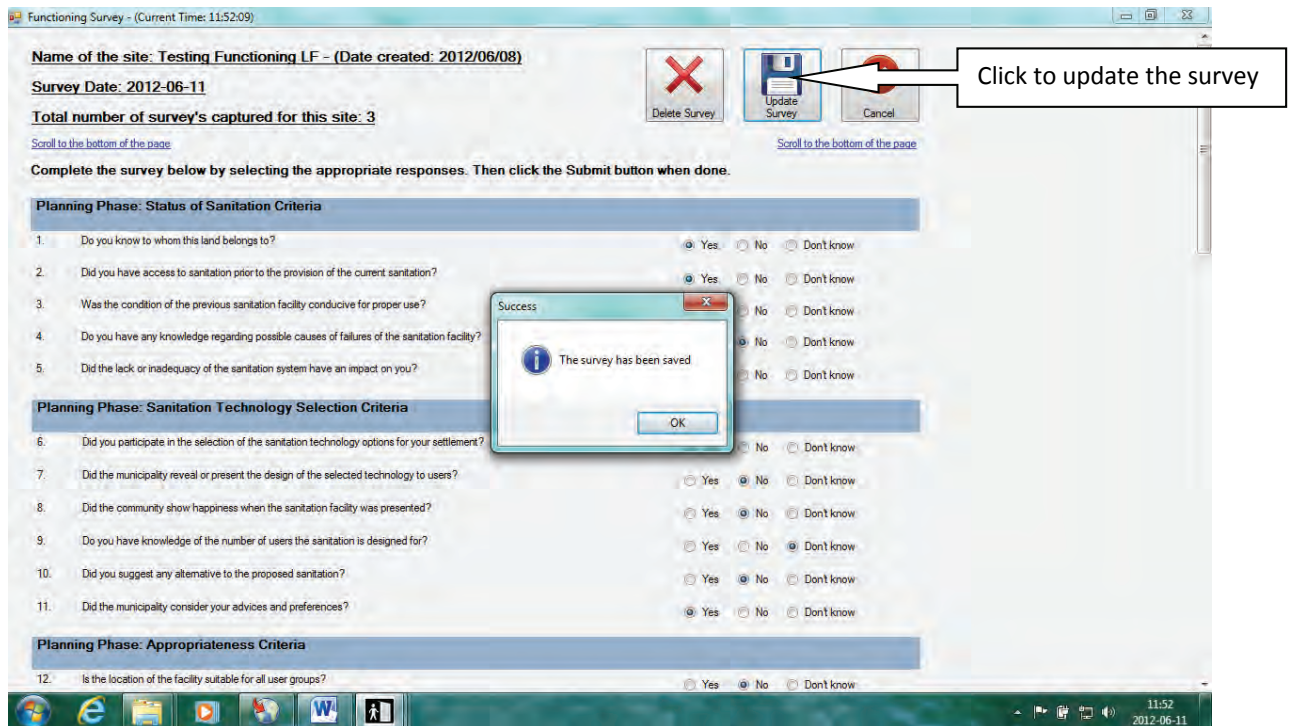
- Or cancel the action by clicking "cancel"

Click here to cancel the survey
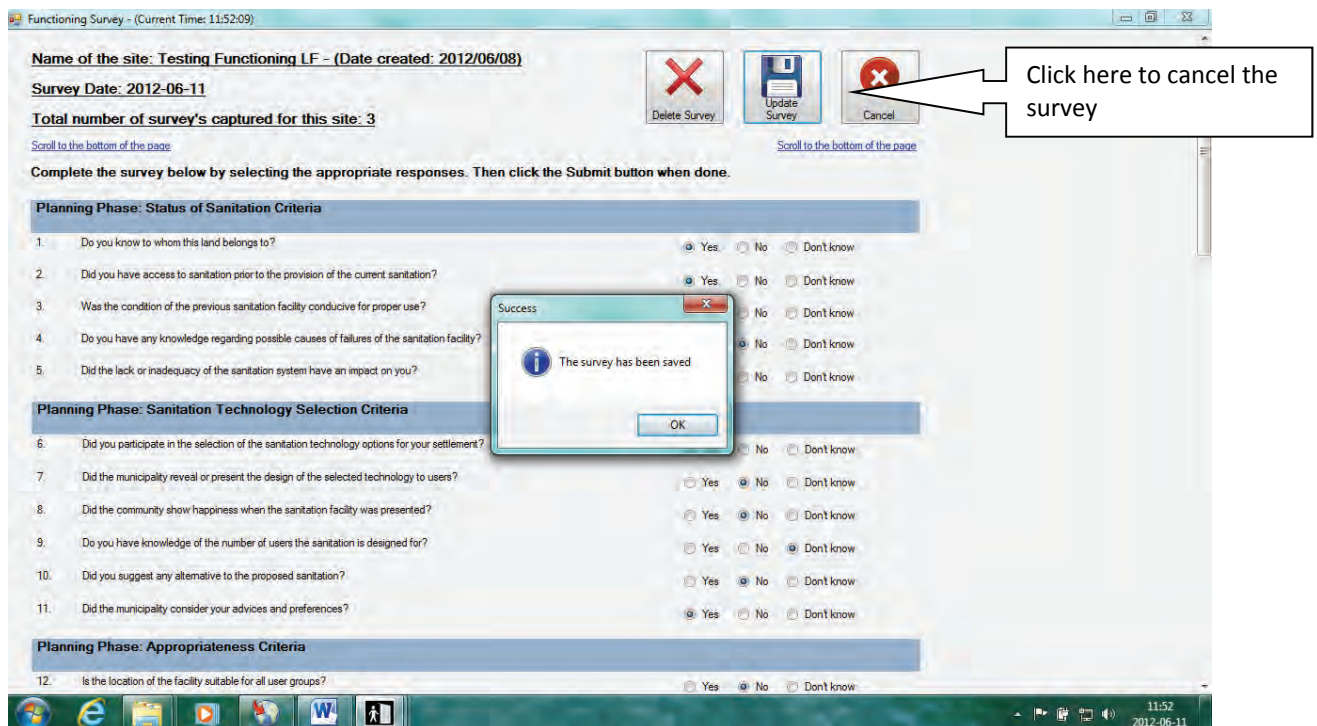
2.3.4 Generate a report

Once the survey submitted, the next phase is to generate the report; this is done by returning to the main menu bar:
o Click the main menu bar

o Select "generate report" button

o Select "type of report" related to the survey conducted by scrolling the button

o "Choose the case study site" that was used to capture information

o Select the "survey date"

o Click "generate report" to get the report of the conducted survey

o Click "reset" if want to adjust the date, change case study site or the type of report

o Click "create new survey" to start the survey

o When all relevant questions are being completed then press "submit" button

o Click "view survey" to see the survey that was captured

o Click "cancel" to cancel the survey started or completed

o After capturing a number of data, you may generate a report; the following window will appear

➤ Click the "Main menu" and select "Generate report"
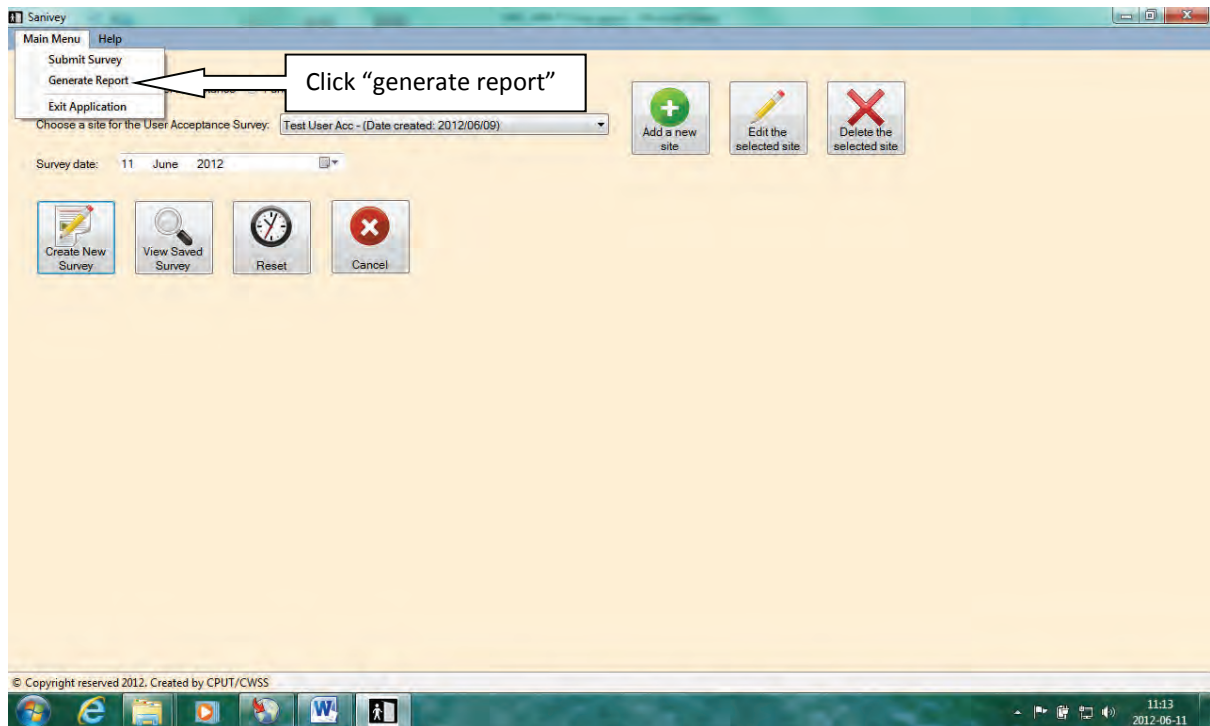
- Select the type of survey for which the report is to be generated by clicking "User acceptance" or "Functioning"
- Select the type of report
- Select the case study site
- Select the starting and end date (during which the survey was undertaken)
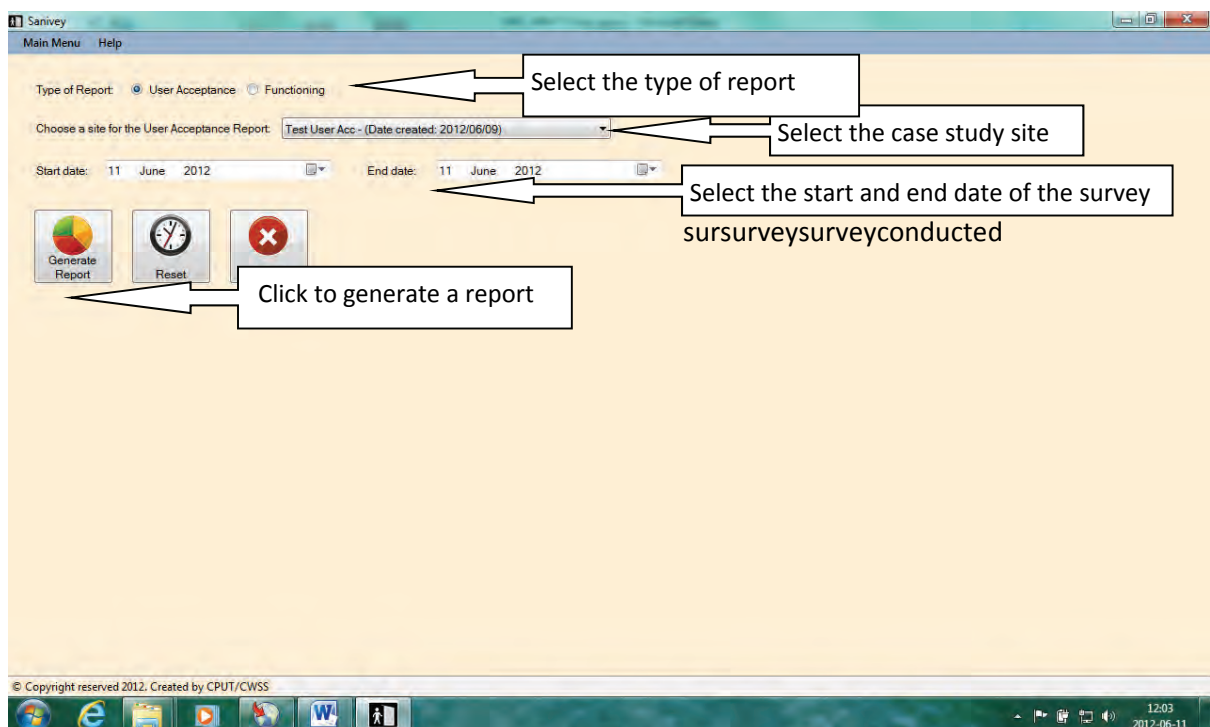
- When clicking the "Generate report" button, the following page will be displayed
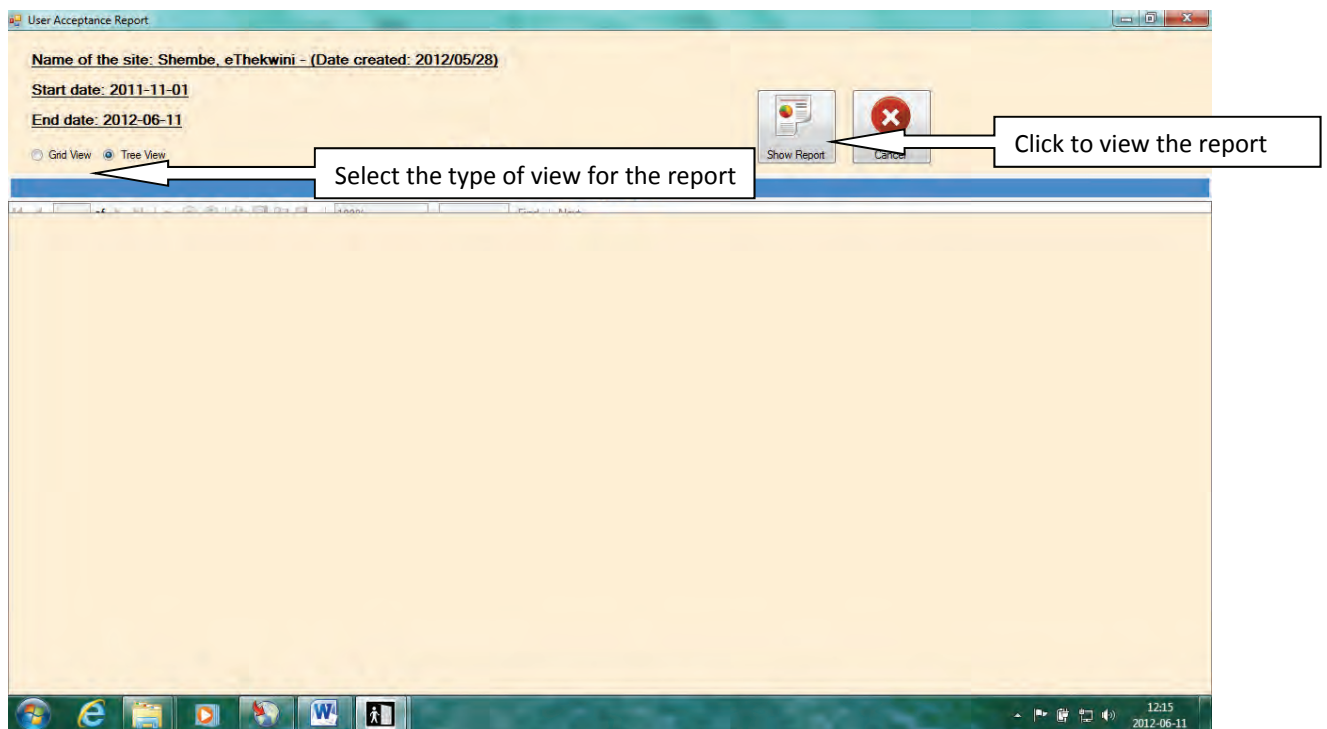
- From this page, you can select the type of view for you report as two views are being provided "grid view" and "tree view"

- Click "show report" to view of the report that has been generated from the survey. The generated report can be (depending on the type of view selected) either tree or grid view. The examples are shown below.

o *Tree view report*
- The tree view report show each phase of the framework and the percentage scored
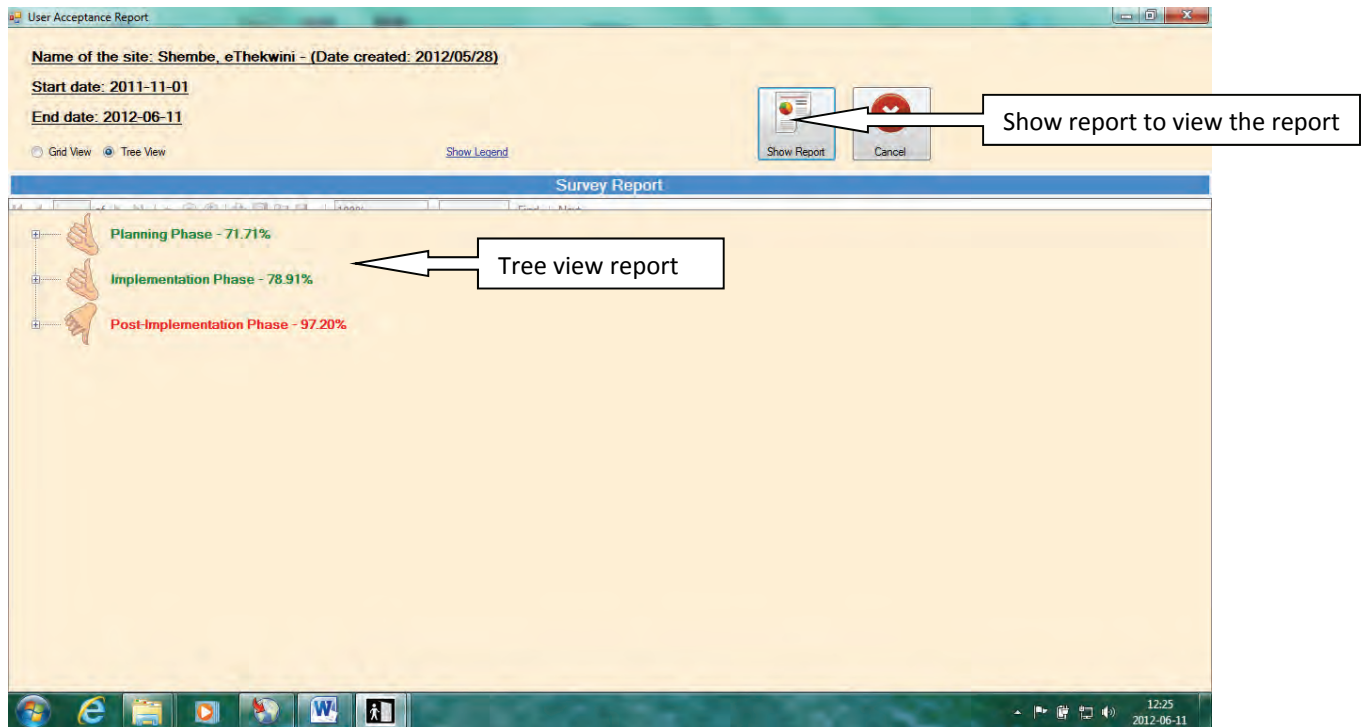
- The tree view report presents results by indicating the percentage scored by each phase of the framework;

- If further details are required, the percentage scored by each criterion and indicators will be displayed as well.

- If more details are required, you can click on the link provided in front of each phase. These details include the phase, criteria and indicators
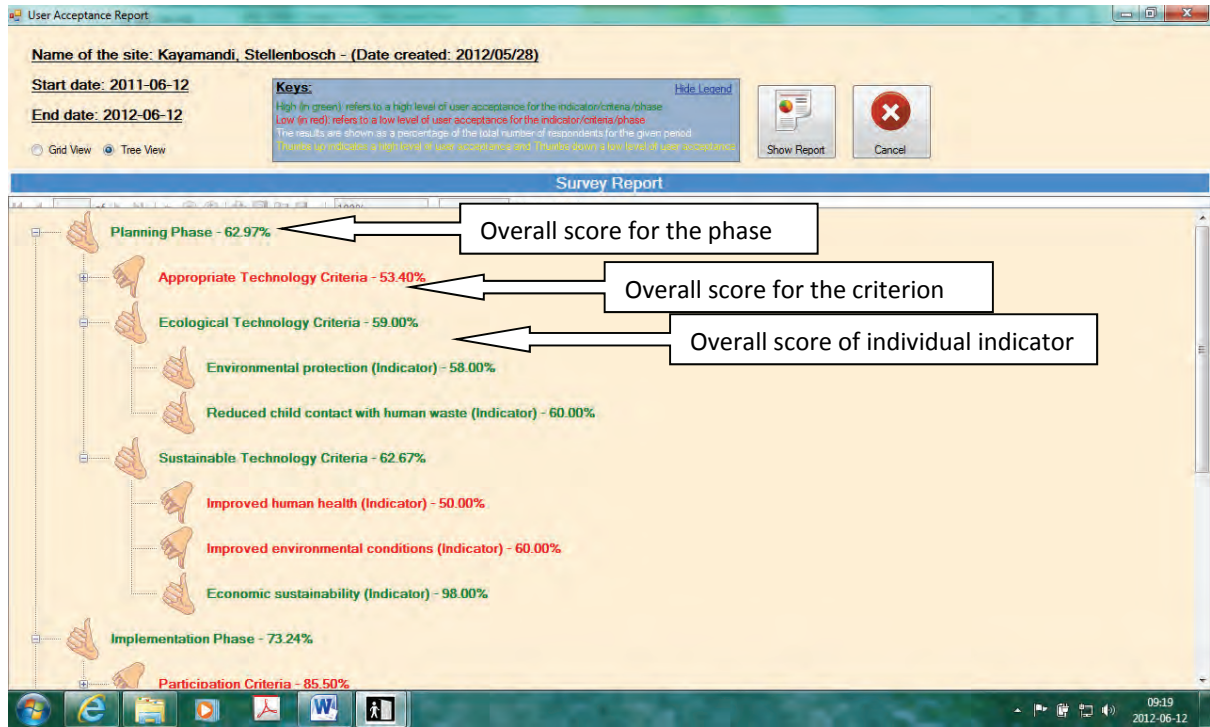
o *Grid view*
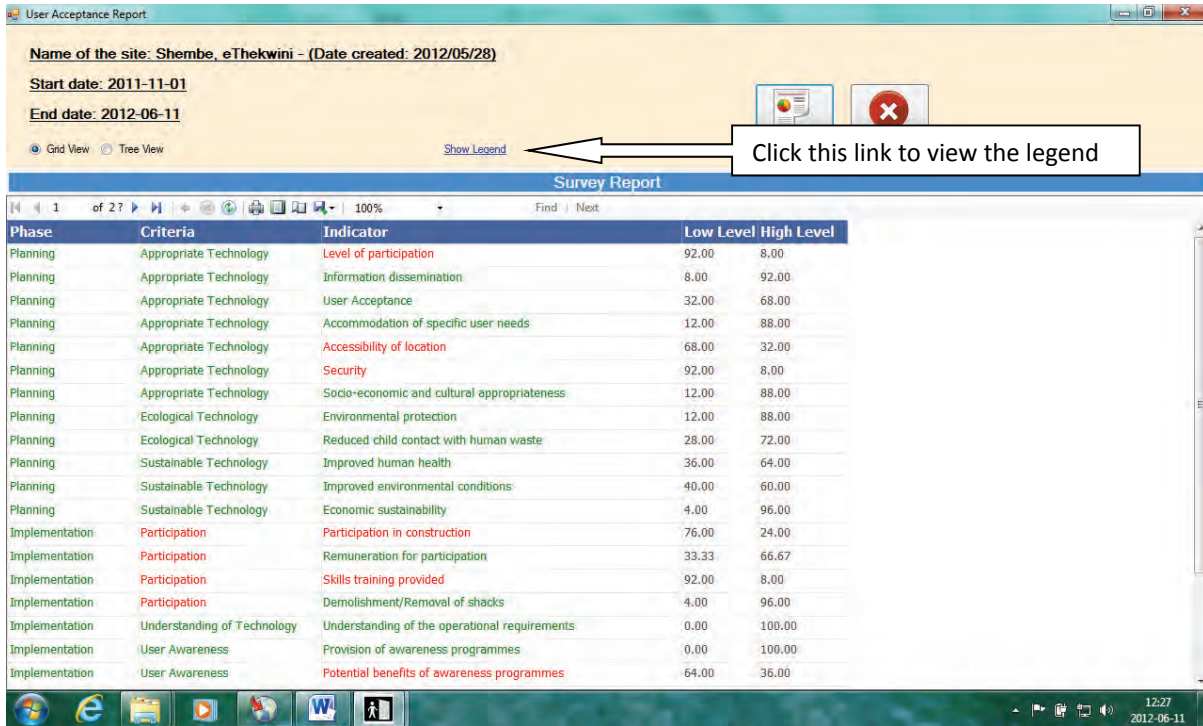
- The grid view shows the phases of the framework, criteria and their related indicators;

- The level of user acceptance or functioning is presented in terms of percentage (based on the indicators only)

➢ The legend is hidden and can be shown by clicking "Show legend"; the legend will be displayed as shown below:

➢ When viewing information on tree view, you can export it to either "PDF", "excel" or "word" format by as per following steps:
- Click "export" to save the report choosing one of the format PDF, Excel or Word
- You can print

➢ *To close the SANIVEY simple click "exit application"*
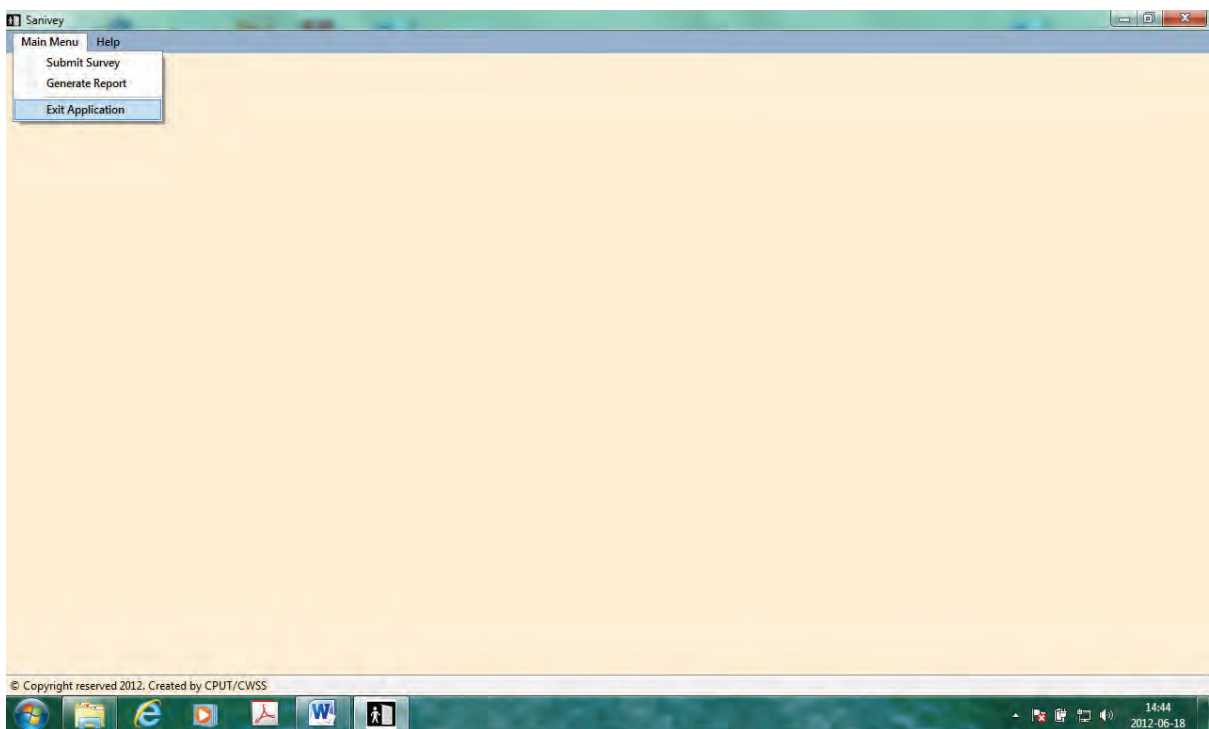
2.4 *Help*

2.4.1   *User manual*

➢ Click on help menu: a drop down menu comprising user manual, contact us and about us will appear
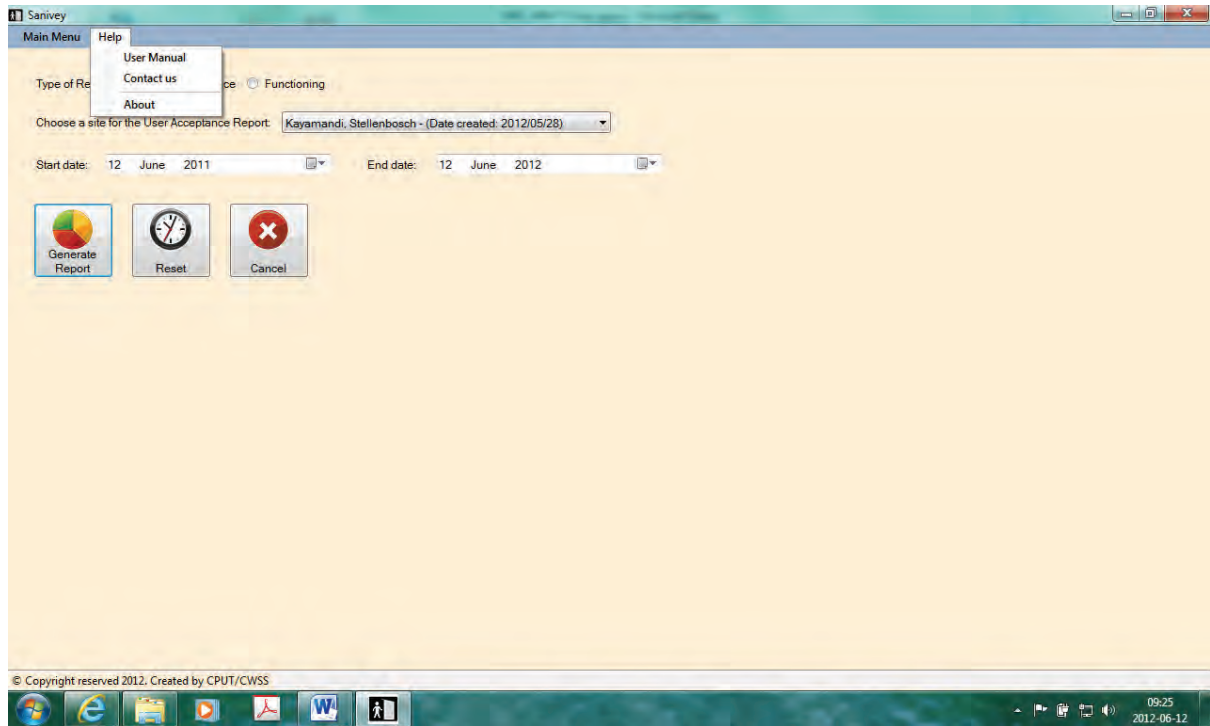
➢ Select "user manual" to view the user manual
   - This button will link the user to the user manual that explains the stepwise use of the software and its application;
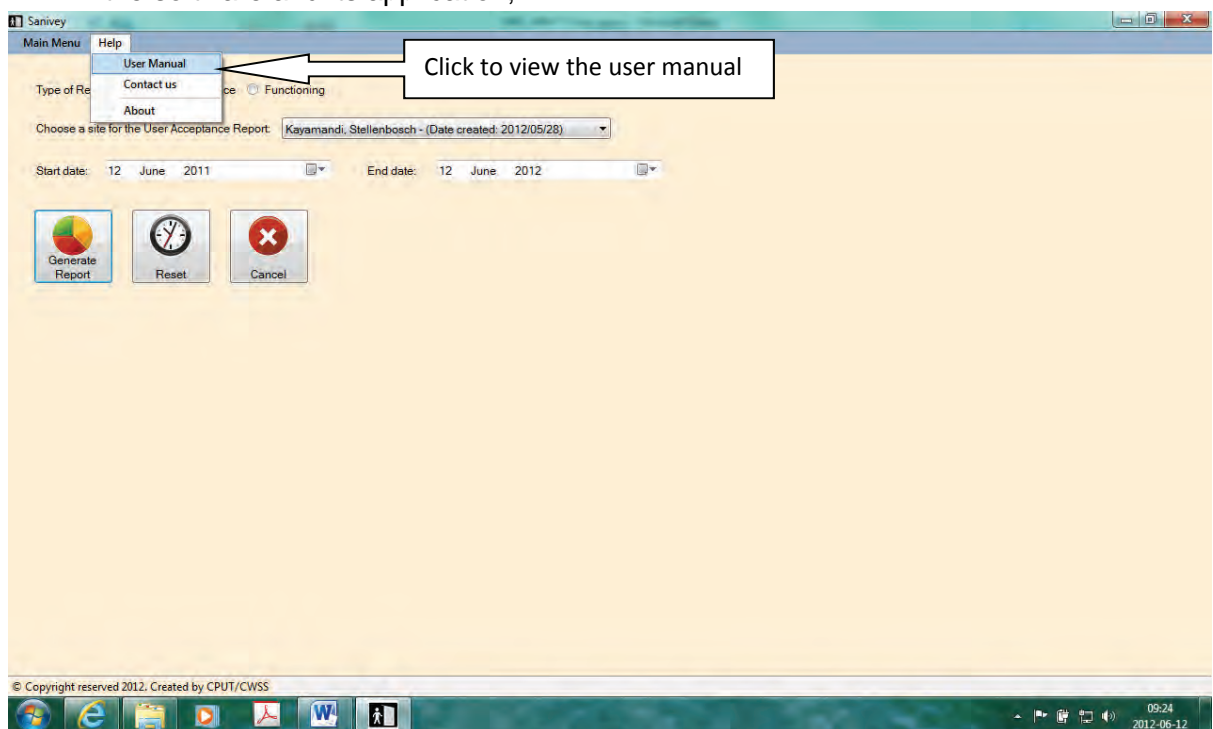
- The user manual will appear as illustrated below
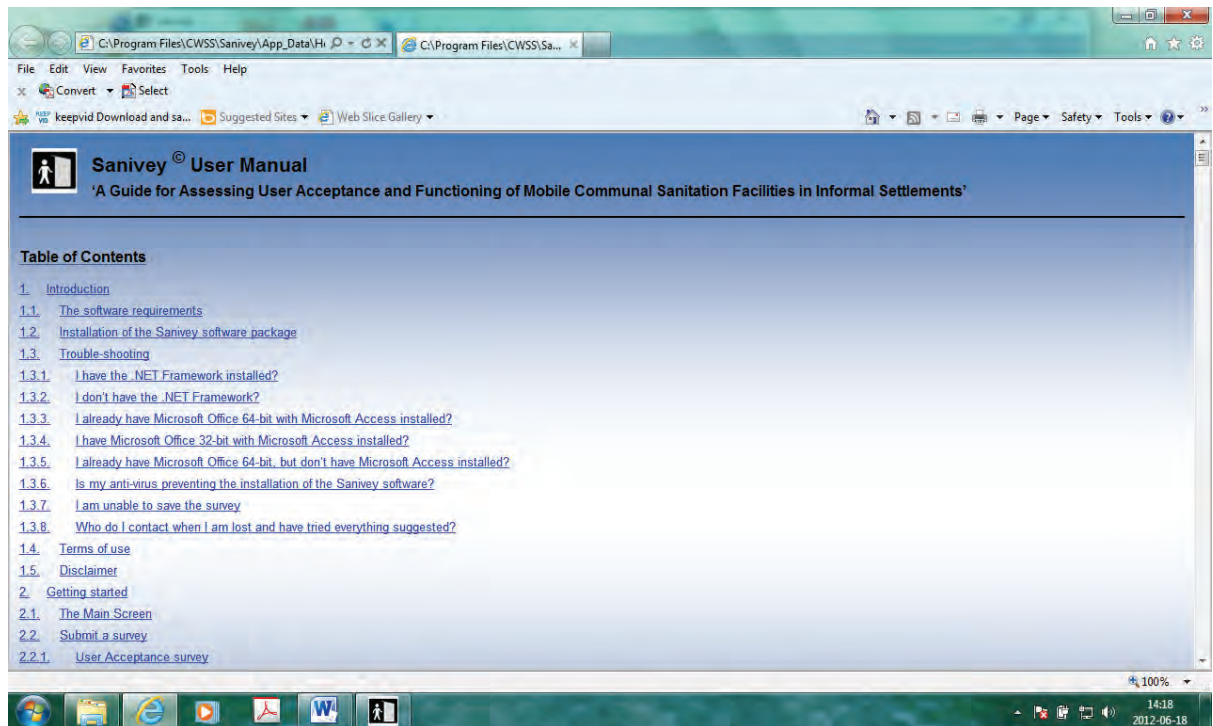
2.4.2 Contact us

➢ Select "contact us" information about the author will appear as indicated below
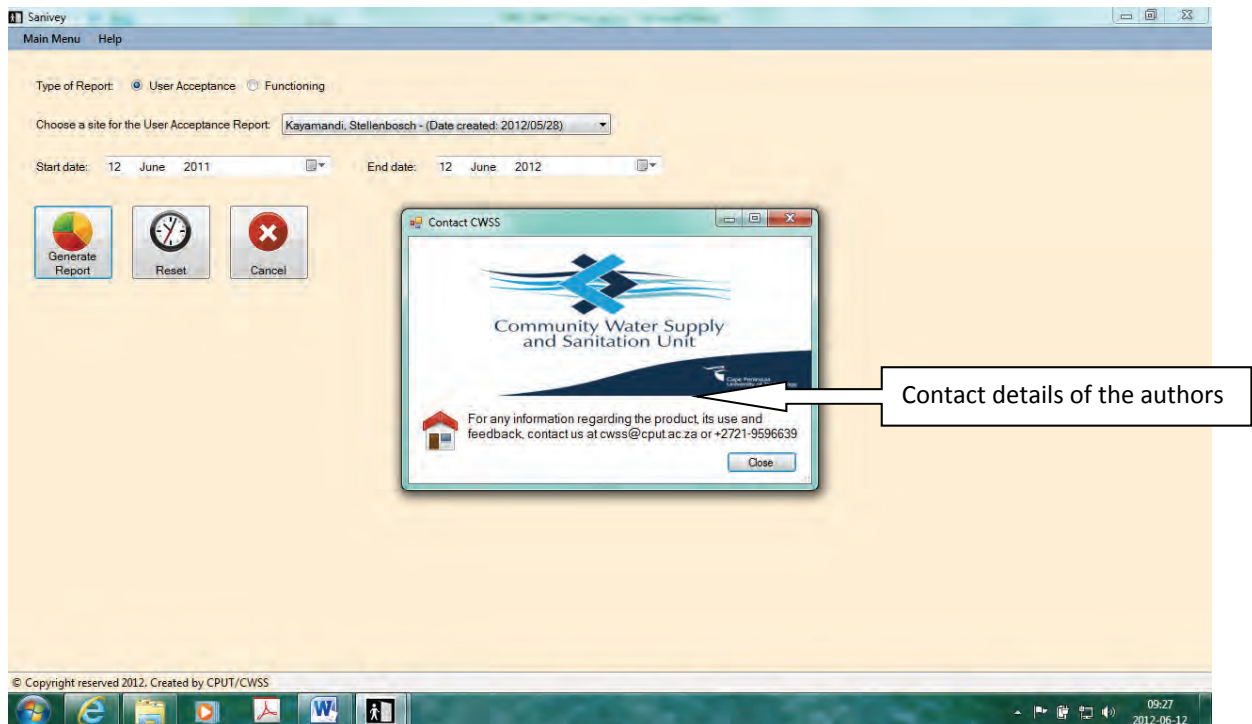
Contact details of the authors

Users are welcome to send suggestions for improvement of the software to the mail address cwss@cput.ac.za, and as time permits these suggestions will be attended to.

A user database will be kept and updates will be sent to all those who supply their contact details. However, users are welcome to customise their own versions of SANIVEY provided permission is given by the funder organisation and/or the author. There is no password required to operate this software, however if any problem is encountered during its application, feel free to contact us.

2.4.3 About us

➢ Select "about us": information regarding the SANIVEY software will appear. This view will provide reader with specific information regarding the SANIVEY software.
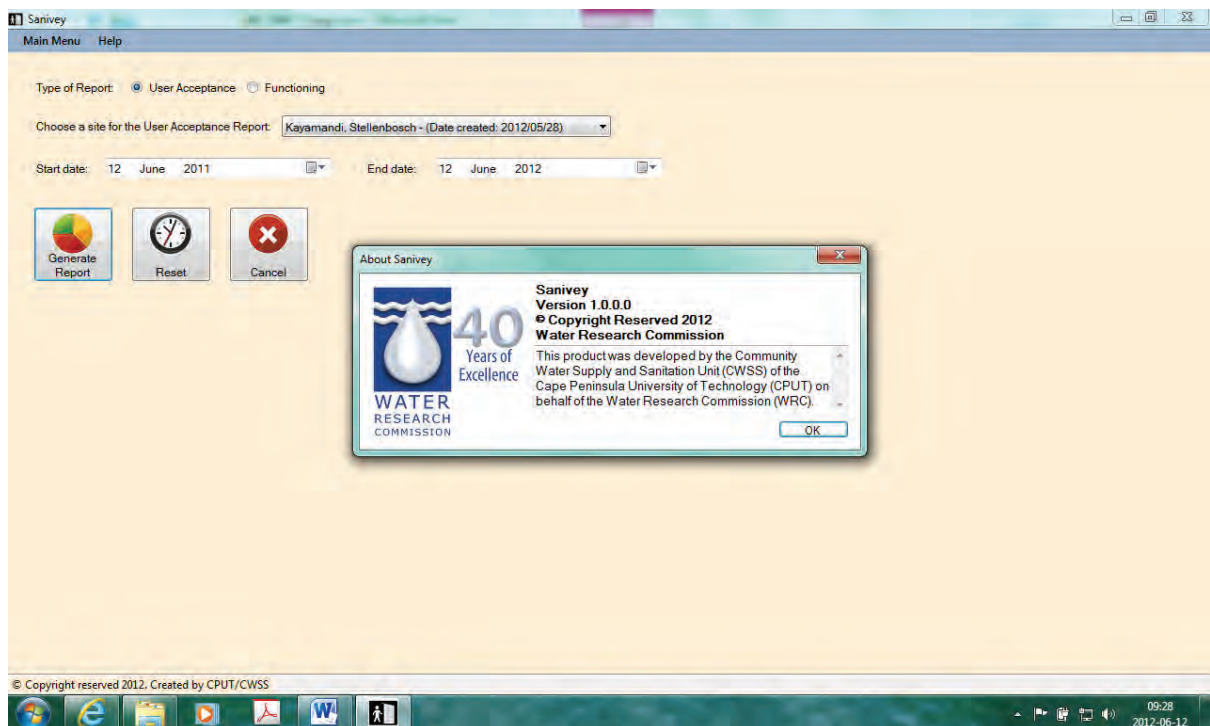
## 3.	The context of application of the SANIVEY software package

The SANIVEY software package can be used to assess both user acceptance and functioning of Mobile Communal sanitation facilities in informal settlement context. It can be adapted and applied to any other sanitation technology. The SANIVEY software package can be used to assess existing and planned sanitation facilities; and will provide detail analyses for both users' acceptance and functioning.

The SANIVEY can be used to assess the level of user acceptance and the functioning of MCSF for:

### a)	Planned sanitation facilities

To ensure access to sanitation for all, various sanitation technologies are being developed and made available for choice. However, municipalities and other service providers are facing challenges to provide and ensure that the selected sanitation technology meet the user needs and will function adequately as per design specifications.

For new or planned sanitation facility, the SANIVEY will assist the design engineer, decision makers and municipal official to gauge the level of user acceptance of the technology, while highlighting some functioning issues that may be expected from the daily use of the facility.The SANIVEY can be used for this purpose in assessing user acceptance and functioning of the facility prior to its implementation.

### b)	Existing sanitation facilities

For existing sanitation facilities, the SANIVEY will provide an overview of the level of user acceptance and functioning of the technology by flagging up the areas of concern that may require urgent action.

It should be noted that the assessment conducted using the SANIVEY software package represents only the user view. The level of acceptance and the extent of functioning should be seen from user perspectives bearing in mind that they are the primary beneficiary of the provided facility.

4. Case study examples of the application of the SANIVEY software package

4.1 Users' acceptance

4.1.1 Pooke se Bos

a) Tree view

This view suggests that the level of user acceptance during the planning and implementation phase was high and went lower during the post-implementation phase. The view points at areas of concern such as user participation and user awareness for which the level of acceptance was low. Areas flagged red are considered as problem areas that need attention in order to ensure adequate functioning of the MCSF, bearing in mind that adequate functioning of MCSF is influenced by the level of user acceptance.

b) Grid view

Phase	Criteria	Indicator	Low Level	High Level
Planning	Appropriate Technology	Level of participation	93.33	6.67
Planning	Appropriate Technology	Information dissemination	33.33	66.67
Planning	Appropriate Technology	User Acceptance	26.67	73.33
Planning	Appropriate Technology	Accommodation of specific user needs	13.33	86.67
Planning	Appropriate Technology	Accessibility of location	16.67	83.33
Planning	Appropriate Technology	Security	10.00	90.00
Planning	Appropriate Technology	Socio-economic and cultural appropriateness	36.67	63.33
Planning	Ecological Technology	Environmental protection	43.33	56.67
Planning	Ecological Technology	Reduced child contact with human waste	33.33	66.67
Planning	Sustainable Technology	Improved human health	23.33	76.67
Planning	Sustainable Technology	Improved environmental conditions	40.00	60.00
Planning	Sustainable Technology	Economic sustainability	3.33	96.67
Implementation	Participation	Participation in construction	90.00	10.00
Implementation	Participation	Remuneration for participation	66.67	33.33
Implementation	Participation	Skills training provided	93.33	6.67
Implementation	Participation	Demolishment/Removal of shacks	16.67	83.33
Implementation	Understanding of Technology	Understanding of the operational requirements	46.67	53.33
Implementation	User Awareness	Provision of awareness programmes	43.33	56.67
Implementation	User Awareness	Potential benefits of awareness programmes	73.33	26.67
Post-Implementation	Oversight and Ownership	Responsibility for managing the facility	10.00	90.00
Post-Implementation	Oversight and Ownership	Conflict around access	100.00	0.00
Post-Implementation	Development Opportunities	Job opportunities	26.67	73.33
Post-Implementation	User Awareness	Regular user awareness	100.00	0.00
Post-Implementation	User Awareness	Good practice	86.67	13.33
Post-Implementation	Monitoring and Evaluation	Adequate training of community-based monitors	53.33	46.67

This view provide a close view of each phase of the sanitation cycle by flagging the level of user acceptance in general and providing details of each phases in terms of criteria and indicators. The level of acceptance (in percentage) concern only individual indicators.

4.1.2 Shembe (eThekwini)

a) Tree view

b) Grid view

Phase	Criteria	Indicator	Low Level	High Level
Planning	Appropriate Technology	Level of participation	92.00	8.00
Planning	Appropriate Technology	Information dissemination	8.00	92.00
Planning	Appropriate Technology	User Acceptance	32.00	68.00
Planning	Appropriate Technology	Accommodation of specific user needs	12.00	88.00
Planning	Appropriate Technology	Accessibility of location	68.00	32.00
Planning	Appropriate Technology	Security	92.00	8.00
Planning	Appropriate Technology	Socio-economic and cultural appropriateness	12.00	88.00
Planning	Ecological Technology	Environmental protection	12.00	88.00
Planning	Ecological Technology	Reduced child contact with human waste	28.00	72.00
Planning	Sustainable Technology	Improved human health	36.00	64.00
Planning	Sustainable Technology	Improved environmental conditions	40.00	60.00
Planning	Sustainable Technology	Economic sustainability	4.00	96.00
Implementation	Participation	Participation in construction	76.00	24.00
Implementation	Participation	Remuneration for participation	33.33	66.67
Implementation	Participation	Skills training provided	92.00	8.00
Implementation	Participation	Demolishment/Removal of shacks	4.00	96.00
Implementation	Understanding of Technology	Understanding of the operational requirements	0.00	100.00
Implementation	User Awareness	Provision of awareness programmes	0.00	100.00
Implementation	User Awareness	Potential benefits of awareness programmes	64.00	36.00
Post-Implementation	Oversight and Ownership	Responsibility for managing the facility	72.00	28.00
Post-Implementation	Oversight and Ownership	Conflict around access	12.00	88.00
Post-Implementation	Development Opportunities	Job opportunities	84.00	16.00
Post-Implementation	User Awareness	Regular user awareness	48.00	52.00
Post-Implementation	User Awareness	Good practice	40.00	60.00
Post-Implementation	Monitoring and Evaluation	Adequate training of community-based monitors	76.00	24.00

4.1.3 Enkanini (Kayamandi – Stellenbosch)

a) Tree view

b) Grid view

Phase	Criteria	Indicator	Low Level	High Level
Planning	Appropriate Technology	Level of participation	96.00	4.00
Planning	Appropriate Technology	Information dissemination	74.00	26.00
Planning	Appropriate Technology	User Acceptance	50.00	50.00
Planning	Appropriate Technology	Accommodation of specific user needs	34.00	66.00
Planning	Appropriate Technology	Accessibility of location	24.00	76.00
Planning	Appropriate Technology	Security	48.00	52.00
Planning	Appropriate Technology	Socio-economic and cultural appropriateness	30.00	70.00
Planning	Ecological Technology	Environmental protection	42.00	58.00
Planning	Ecological Technology	Reduced child contact with human waste	40.00	60.00
Planning	Sustainable Technology	Improved human health	50.00	50.00
Planning	Sustainable Technology	Improved environmental conditions	60.00	40.00
Planning	Sustainable Technology	Economic sustainability	2.00	98.00
Implementation	Participation	Participation in construction	92.00	8.00
Implementation	Participation	Remuneration for participation	50.00	50.00
Implementation	Participation	Skills training provided	94.00	6.00
Implementation	Participation	Demolishment/Removal of shacks	0.00	100.00
Implementation	Understanding of Technology	Understanding of the operational requirements	0.00	100.00
Implementation	User Awareness	Provision of awareness programmes	0.00	100.00
Implementation	User Awareness	Potential benefits of awareness programmes	92.00	8.00
Post-Implementation	Oversight and Ownership	Responsibility for managing the facility	56.00	44.00
Post-Implementation	Oversight and Ownership	Conflict around access	44.00	56.00
Post-Implementation	Development Opportunities	Job opportunities	64.00	36.00
Post-Implementation	User Awareness	Regular user awareness	94.00	6.00
Post-Implementation	User Awareness	Good practice	90.00	10.00
Post-Implementation	Monitoring and Evaluation	Adequate training of community-based monitors	90.00	10.00

4.2   Functioning

4.2.1 Pooke se Bos

a) Tree view

b) Grid view

Phase	Criteria	Indicator	Adequate	Inadequate	Missing
Planning	Status of the Sanitation	Status of the land	70.00	20.00	10.00
Planning	Status of the Sanitation	Access to sanitation	90.00	10.00	0.00
Planning	Status of the Sanitation	Status of sanitation in settlement	10.00	86.67	3.33
Planning	Status of the Sanitation	Causes of sanitation problems	93.33	0.00	6.67
Planning	Status of the Sanitation	Consequences of inadequate sanitation practice	100.00	0.00	0.00
Planning	Sanitation Technology Selection	User participation in the technology choice	80.00	13.33	6.67
Planning	Sanitation Technology Selection	Presentation of the sanitation information	53.33	36.67	10.00
Planning	Sanitation Technology Selection	User reaction to the selected technology	86.67	6.67	6.67
Planning	Sanitation Technology Selection	Knowledge of the number of potential users	33.33	66.67	0.00
Planning	Sanitation Technology Selection	Alternative suggestions from users	23.33	66.67	10.00
Planning	Sanitation Technology Selection	Consideration of the user suggestions	0.00	86.67	13.33
Planning	Appropriate Technology	Suitability of the location	63.33	23.33	13.33
Planning	Appropriate Technology	Ease of operation and maintenance (technical appropriateness)	40.00	30.00	30.00
Planning	User Awareness	Inclusion of a user awareness programme	53.33	30.00	16.67
Planning	User Awareness	Responsibility of the awareness programme	80.00	13.33	6.67
Planning	User Awareness	User's responsibility of the awareness programme	26.67	66.67	6.67
Planning	User Awareness	User suggestions	0.00	100.00	0.00
Implementation	Sanitation Technology Option	Knowledge of the type of technology provided	46.67	10.00	43.33

Implementation	Infrastructure Development	Location of the facility	56.67	36.67	6.67
Implementation	Infrastructure Development	Suitability to all user groups	53.33	30.00	16.67
Implementation	Infrastructure Development	Robustness of technology	90.00	0.00	10.00
Implementation	Operational Requirements	Ease of use	96.67	3.33	0.00
Implementation	Operational Requirements	Impact on non-compliance on functioning	6.67	0.00	93.33
Implementation	Operational Requirements	Suggestions for enhancing compliance	96.67	3.33	0.00
Implementation	Operational Requirements	Ease of operation and maintenance	90.00	0.00	10.00
Post-Implementation	Operation Maintenance	Knowledge of operation and maintenance tasks	90.00	0.00	10.00
Post-Implementation	Operation Maintenance	Strategies for ensuring adequate functioning	66.67	0.00	33.33
Post-Implementation	Operation Maintenance	User participation in the operation and maintenance	60.00	40.00	0.00
Post-Implementation	Operation Maintenance	User contribution in operation and maintenance	23.33	66.67	10.00
Post-Implementation	Operation Maintenance	User responsibility for the operation and maintenance	13.33	73.33	13.33
Post-Implementation	Operation Maintenance	Support requirements for participation	36.67	50.00	13.33
Post-Implementation	Monitoring and Evaluation	Manageability of the facility	93.33	0.00	6.67
Post-Implementation	Monitoring and Evaluation	Ease of monitoring	80.00	13.33	6.67
Post-Implementation	Monitoring and Evaluation	Knowledge of monitoring and evaluation criteria	80.00	16.67	3.33
Post-Implementation	Monitoring and Evaluation	Local management of the facility	66.67	3.33	30.00
Post-Implementation	Monitoring and Evaluation	Monitoring and evaluation protocol	93.33	0.00	6.67
Post-Implementation	User Issues	Problems encountered	40.00	50.00	10.00
Post-Implementation	User Issues	Reporting protocol	16.67	83.33	0.00
Post-Implementation	User Issues	Response time to address problems	0.00	13.33	86.67

4.2.2 Shembe (eThekwini)

a) Grid view

Phase	Criteria	Indicator	Adequate	Inadequate	Missing
Planning	Status of the Sanitation	Status of the land	100	0	0
		Access to sanitation	100	0	0
		Status of sanitation in settlement	4	96	0
		Causes of sanitation problems	24	72	4
		Consequences of inadequate sanitation practice	100	0	0
	Sanitation Technology Selection	User participation in the technology choice	52	8	40
		Presentation of the sanitation information	52	4	44
		User reaction to the selected technology	88	8	4
		Knowledge of the number of potential users	56	40	4
		Alternative suggestions from users	24	60	16
		Consideration of the user suggestions	0	20	80
	Appropriate Technology	Suitability of the location	92	0	8
		Ease of operation and maintenance (technical appropriateness)	100	0	0
	User Awareness	Inclusion of a user awareness programme	64	20	16
		Responsibility of the awareness programme	40	32	28
		User's responsibility of the awareness programme	60	32	8
		User suggestions	0	100	0
Implementation	Sanitation Technology Option	Knowledge of the type of technology provided	44	52	4
	Infrastructure Development	Location of the facility	80	12	8
		Suitability to all user groups	56	40	4
		Robustness of technology	88	8	2
	Operational Requirements	Ease of use	100	0	0
		Impact on non-compliance on functioning	52	44	4
		Suggestions for enhancing compliance	100	0	0
		Ease of operation and maintenance	100	0	0
Post-Implementation	Operation Maintenance	Knowledge of operation and maintenance tasks	88	8	4
		Strategies for ensuring adequate functioning	56	16	28
		User participation in the operation and maintenance	68	4	28
		User contribution in operation and maintenance	80	4	16
		User responsibility for the operation and maintenance	48	48	4

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		Support requirements for participation	68	12	20
	Monitoring and Evaluation	Manageability of the facility	96	4	0
		Ease of monitoring	100	0	0
		Knowledge of monitoring and evaluation criteria	84	0	16
		Local management of the facility	68	4	28
		Monitoring and evaluation protocol	84	0	16
	User Issues	Problems encountered	12	88	0
		Reporting protocol	20	80	0
		Response time to address problems	8	92	0

4.2.3 Enkanini (Kayamandi – Stellenbosch)

a) Tree view

b) Grid view

Phase	Criteria	Indicator	Adequate	InAdequate	Missing
Planning	Status of the Sanitation	Status of the land	83.93	10.71	5.36
Planning	Status of the Sanitation	Access to sanitation	94.64	5.36	0.00
Planning	Status of the Sanitation	Status of sanitation in settlement	10.71	87.50	1.79
Planning	Status of the Sanitation	Causes of sanitation problems	62.50	32.14	5.36
Planning	Status of the Sanitation	Consequences of inadequate sanitation practice	100.00	0.00	0.00
Planning	Sanitation Technology Selection	User participation in the technology choice	67.86	10.71	21.43
Planning	Sanitation Technology Selection	Presentation of the sanitation information	53.57	21.43	25.00
Planning	Sanitation Technology Selection	User reaction to the selected technology	87.50	7.14	5.36
Planning	Sanitation Technology Selection	Knowledge of the number of potential users	44.64	53.57	1.79
Planning	Sanitation Technology Selection	Alternative suggestions from users	26.79	60.71	12.50
Planning	Sanitation Technology Selection	Consideration of the user suggestions	10.71	46.43	42.86
Planning	Appropriate Technology	Suitability of the location	75.00	14.29	10.71
Planning	Appropriate Technology	Ease of operation and maintenance (technical appropriateness)	69.64	14.29	16.07
Planning	User Awareness	Inclusion of a user awareness programme	58.93	25.00	16.07
Planning	User Awareness	Responsibility of the awareness programme	62.50	21.43	16.07
Planning	User Awareness	User's responsibility of the awareness programme	42.86	50.00	7.14
Planning	User Awareness	User suggestions	1.79	98.21	0.00
Implementation	Sanitation Technology Option	Knowledge of the type of technology provided	46.43	28.57	25.00

Implementation	Infrastructure Development	Location of the facility	66.07	26.79	7.14
Implementation	Infrastructure Development	Suitability to all user groups	55.36	33.93	10.71
Implementation	Infrastructure Development	Robustness of technology	89.29	3.57	7.14
Implementation	Operational Requirements	Ease of use	98.21	1.79	0.00
Implementation	Operational Requirements	Impact on non-compliance on functioning	28.57	19.64	51.79
Implementation	Operational Requirements	Suggestions for enhancing compliance	98.21	1.79	0.00
Implementation	Operational Requirements	Ease of operation and maintenance	94.64	0.00	5.36
Post-Implementation	Operation Maintenance	Knowledge of operation and maintenance tasks	89.29	3.57	7.14
Post-Implementation	Operation Maintenance	Strategies for ensuring adequate functioning	62.50	7.14	30.36
Post-Implementation	Operation Maintenance	User participation in the operation and maintenance	64.29	23.21	12.50
Post-Implementation	Operation Maintenance	User contribution in operation and maintenance	50.00	37.50	12.50
Post-Implementation	Operation Maintenance	User responsibility for the operation and maintenance	32.14	58.93	8.93
Post-Implementation	Operation Maintenance	Support requirements for participation	51.79	32.14	16.07
Post-Implementation	Monitoring and Evaluation	Manageability of the facility	92.86	3.57	3.57
Post-Implementation	Monitoring and Evaluation	Ease of monitoring	89.29	7.14	3.57
Post-Implementation	Monitoring and Evaluation	Knowledge of monitoring and evaluation criteria	78.57	5.36	16.07
Post-Implementation	Monitoring and Evaluation	Local management of the facility	67.86	3.57	28.57
Post-Implementation	Monitoring and Evaluation	Monitoring and evaluation protocol	87.50	0.00	12.50
Post-Implementation	User Issues	Problems encountered	26.79	67.86	5.36
Post-Implementation	User Issues	Reporting protocol	17.86	82.14	0.00
Post-Implementation	User Issues	Response time to address problems	3.57	48.21	48.21

5. Conclusions

The SANIVEY was intentionally developed to assist designers, municipal officials and many other stakeholders involved in the sanitation services with an easy to use tool for analysing data pertaining to the user acceptance and functioning of MCSF. The installation and application of SANIVEY is provided in this guide and the help menu of the software package.

The SANIVEY (as per design specifications) will provide users with a broad picture of the status of the sanitation services at each phase of the sanitation cycle (referred as planning, implementation and post-implementation).

Each phase of the sanitation cycle is flagged using green or red colours that respectively indicate the non-problem and problem areas. Further details of each phase may be obtained by selecting grid or tree view which will provide the extent of the problem by highlighting concerned criterion and indicators.

From the application of the SANIVEY at the three case study sites, it is believed that the level of details provided will assist municipal officials, design engineers and other interested parties in the analysis of the sanitation technologies and services being piloted or provided to a given settlements.

The SANIVEY software is easy to use as it provides the user with a picture of the sanitation problem as such. The results of the analysis provided are limited to a simple indication of the extent of the problem; and does not provide a solution to the problem itself.