Mission Report

from a short-term mission on Construction Statistics.

From 10 November to 28 November 2003

TA for the Scandinavian Support Program to Strengthen the Institutional Capacity of the National Statistics, Mozambique

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List of abbreviations

CO	Scanstat Coordination Office in Statistics Denmark
Danida	Danish International Development Assistance
DKK	Danish Kroner
DSt	Statistics Denmark
EUR	European Euro
INE	Instituto Nacional de Estatística, Mozambique
INE-P	Instituto Nacional de Estatística, Portugal
MZM	Mozambique Meticais
NOK	Norwegian Kroner
Scanstat	Consortium between Statistics Denmark, Statistics Norway and Statistics Sweden
SCB	Statistics Sweden
SEK	Swedish Kronor
SSB	Statistics Norway
USD	US Dollars

Preface

This mission on Construction statistics is a continuation of the work carried out by Irene Tuveng, former long-term consultant in The Scandinavian Bridging Support Programme, and this report is structured according to the intentions described in the report "A plan of a new Construction Statistics, March 2003".

The mission was conducted during 10-28 November 2003 by Inga-Maj Rasmusson from Statistics Sweden (SCB), within the Scandinavian programme. I am responsible for this report and it contains my views.

I would like to express my greatest thanks to all persons I met for the kind support and the valuable information I received during my stay in Mozambique - especially my main counterparts: João Loureiro – President of INE, and Natércia Macuacua – Head of Department for Statistics on Goods and Environment, who highly facilitated my work. I will also express my thanks to Azarias Nhanzimo - Director of Directorate for Sectorial Statistics and Business Statistics and Matilde Chiulele, Department for Statistics on Goods and Environment, who gave me a lot of valuable information.

1. INTRODUCTION

1.1 Background for the mission

The main objective for INE is to establish a statistical system that covers most kinds of construction activity, both Building and Engineering, as well as statistics on different types of building projects - started and completed. Available data from both administrative registers and collected in surveys should be used.

We will look at the possibility to **develop statistics** on construction work and its contribution (to the stock) of new-built and rehabilitated buildings in Mozambique. The intentions are to increase the knowledge/skills and capacity in INE/DESE to produce useful and reliable statistics - of sufficient quality - on Construction and Housing. In the developing process it is also important to regard the users' demand for these statistics. The work done in this mission is to be regarded as a first step on developing the statistics in the sector.

1.2 Construction statistics today

In Mozambique today it is difficult to find statistics on Construction activities and reliable figures on investments in the Construction sector. Especially there is a lack of statistics on Building and Housing.

Much construction activity is done outside the authorized enterprises in the Construction sector. It is done through what is called auto-construction by enterprises or private persons for their own needs.

Today INE conducts a monthly survey based on data from enterprises mainly operating within the construction sector. It concerns both new construction and rehabilitation work of residential and non-residential buildings - to some extent - and of construction of infrastructure. The survey is based on a small sample of big enterprises (more than 30 employees).

The statistical variables are mostly data on costs of construction, material and remuneration of employees and number of employees.

1.3 Terms of reference

The objective for this short-term mission was to assist INE to improve the Construction statistics as a whole. It implied reviewing and developing further the existing survey, especially to strengthen the coverage of the construction activity in the statistical surveys and to investigate further and suggest methods to produce building statistics that includes auto-construction. The focus was on finding methods to cover the Building and Housing part of the construction sector, and **especially to include auto-construction works**.

This project was carried out within the Scandinavian assistance programme.

1.4 Users demand

The users are not quite satisfied with the statistic on construction of today:
- There are unsatisfied statistical needs.
- The statistics are not sufficiently reliable.
- There is a lack of coverage. Some parts of the population are not covered.
- The sample is too small.

2. SOME PROBLEMS

2. 1 Undercoverage

The construction statistics of today is based on a monthly sample survey of about 180 enterprises in the sector. The sample is drawn once a year from INE:s business register of about 300 authorized enterprises with at least 30 employees mainly active in the construction sector. Thus many enterprises are not covered by the sample. The most important non-coverages are
- lack of enterprises in the construction sector with less then 30 employees and
- lack of auto-construction works.

The data collected by a questionnaire sent to the big enterprises are value-data on new construction and rehabilitation works. It covers all types of construction projects; residential, non-residential, a mix of

these, and of infrastructure projects such as roads, bridges, wells, pipelines and others.

2.2 Volume-indicators in Building and Housing statistics

The statistics of today do not contain enough statistical information on housing indicators, such of total new floor area, number of dwellings in department blocks, small houses and single residences respectively in started respective completed construction projects. Nor do the statistics of today give an answer to how many building projects have been completed during a period. This lack of volume indicators makes it impossible to elaborate the statistics to evaluate and monitor the housing development of the country.

Thus there is a need of a more detailed classification of types of building projects.

2.3 Auto-construction

INE wants to cover auto-construction works. In auto-construction no construction company is contracted to do the work. The work is done by private persons, firms, and organisations who do the construction work themselves for their own needs, i.e. the investor does the construction job himself. It can be done by enterprises or by private persons by
- using own staff/friends
- own hands
- hiring workers or specialists to do parts of specific jobs, for instance connection to water pipes or electrical installations.

It is not possible to catch data on these kinds of projects by asking construction enterprises.

There are lots of auto-construction building projects. The under-coverage in the statistics due to the lack of auto-construction works is very large. To handle this problem we have to make a sample of some kind of auto-construction works (perhaps every tenth project, depending on size, etc).

For auto-construction works, there are no enterprises reporting to INE when a project starts up. Some information on new projects can be obtained from building permits. In the building permits, the starting time of the construction work is licensed to a specific period. Building permits actually give the first information on existence of new building project. From the building permit it is possible to find the address of the investor and some data about the project.

3. SOME IDEAS AND POSSIBILITIES ON IMPROVEMENTS

3.1 Collect data on auto-construction - legal projects

The investor applies to the local authority to get a license (building permit) to carry out a specific construction project. Municipality Councils provide the authorization and the license to build. The content and quality of the project-data in the building permits differ a lot among the various Municipality Councils.

Before using building permits as source of information on new building projects we have to investigate the quality and the availibility of data in building permits. Some examples on questions we need an answer to are: Which variables concerning a project can be caught from building permits? Are the data registered on electronic media? Of which quality are the data? How and how often is it possible to collect data on new building permits?

Collecting data on **legal auto-construction projects** is a delicate matter. There is a need to implement a new procedure to collect data on licensed auto-construction works, mainly based on building permits. One way is to ask the Municipality Councils to send a list of projects, from which is drawn a sample of licensed new projects. The data of the projects can be caught from the building permits and delivered in a questionnaire (i.e. as a list). Together with the municipalities, INE would have to work out a new special questionnaire to send to the Municipality Councils.

Maybe it is more feasible to have the Municipality Councils draw the samples. INE would then have to elaborate a standard procedure for how to draw a sample and give instructions on how to use it.

Additionally, the Municipality Council may have to do the data collection for these sample projects. They might be asked to fetch and fill in the requested data from administrative register of newly licensed building permits, either from electronic media - if data have been registered that way - or from paper sheets. They might also have to collect some other requested data by contacting the owner of the project or his contact person (responsible engineer or supervisor).

Maybe, for auto-construction works it is sufficient to collect data concerning new building projects only and disregard rehabilitation works.

Once a month the list data on the sample of new projects will be sent to INE. Important data in the questionnaire/list are for example:
- Identity data (names, contact numbers, location)
- Dates (month of start and completion of the building works)
- Type of building project,
- Number of stories (max 3)

- New floor area
- Number of dwellings (additional number of dwellings in rehabilitation works, if it is such a project)
- Total costs (costs of materials, remuneration costs, costs of ground work).

3.2 Estimate data about illegal auto-construction works – project without a licence

However it is obvious that a large part of the residential buildings are built without a license (building permit), either because the investor has not applied for a license or has not got a license (illegal). This is often the case with auto-construction works. The time between applying and getting a license is often very long, and people cannot wait to start the construction work till they have got the license. Some of these projects are licensed afterwards.

There is a big problem of illegal construction works. In some areas - even large areas - there are lots of them. In those areas it is a rather hard task to separate new houses from old ones. Solving these problems takes time and requires a lot of investigation and developing work.

We have to check some ideas.

3.2.1 Sample of spots
Draw a sample of spots (of some space) and identify and count new "projects" by **ocular inspection** on place.
We have to
- define the areas concerned by a specific density of illegal very poor and small "buildings".
- map and document the areas. The areas need to be clearly demarcated from the surroundings
- draw sample spots in these areas
- engage some people – without any connection to the Municipality Council or any other local authority - to count and estimate the rate/number of *new* such small "buildings" in the sampled spots. The inspection and the counting should be done by persons engaged for this purpose by INE. They must know the conditions in the areas.

From this data it may be possible to evaluate the rate/number of new illegal small "buildings" in the district concerned.

This method will be very arduous and very expensive. The reasons are:
- it is necessary to define and measure the areas with the specific density of illegal "buildings"
- a new specific sample survey of spots will have to be prepared
- a new questionnaire for this special data collection will have to be prepared
- the people engaged to do the counting and estimation must get information and instruction on how to do the job
- Many people will be engaged. This is a likely source of errors.

3.2.2 Air photography

Another method to estimate the rate of new illegal "buildings" in the areas of many poor small "buildings" is by air photography from time to time. By counting the differences in the number of "buildings" in a sample of areas it may be possible to estimate the number of new "buildings".
We then have to:
- Identify the areas with many poor "buildings"
- Do the air photography
- Map and get the space of each "poor" area
- Draw samples of such areas
- Count the differences in the number of "buildings" between two occasions in each sampled area
- Evaluate a method to estimate the yearly numbers of new "buildings" for all such areas in the municipality concerned
- Estimate the number of new "buildings" by types.

The costs of this method must be carefully evaluated.

3.2.3 Quantities of used building materials

We may draw some conclusions and estimate the production of new "buildings" from the quantities used of some specific building materials, for example bricks, cement, sheets of zinc etc. It is a big job, though, to develop a useful method of estimating the number of new "buildings" in areas with many poor small houses where very poor people live.

We have to:
- Do some estimation on the quantities of materials needed to build a new poor "building"
- Identify enterprises who sell building materials to private persons
- Collect data on quantities of building materials sold to private persons in a sample of such poor areas
- Develop a method to estimate new "buildings" in areas of many poor small "houses" where very poor people live.

3.2.4 Auto-construction as part of the Informal Sector Survey
We have to:
- Define the users' needs of data on auto-construction activities (tables, indicators, how often, etc.)
- Include some questions in the Informal Sector Questionnaire, such as Who made this house (Private company, yourself, friends, etc.); Did you have a permit from the council or local authorities; type, quality and size of the house.
- Get an agreement on the questions within the INE (DCNIG and DCI), and then with the MOPH and Municipalities
- Pilot this set of questions.
These four alternatives have to be carefully examined and evaluated before deciding which to choose.

3.3 Enlarged coverage and revised form in the sample-survey

3.3.1 Extend the coverage of enterprises in the surveys

To improve the construction statistics based on the survey with a questionnaire sent to big enterprises, licensed to be active in the

construction sector, one accessible way may be to include other enterprises active in the construction sector. We then have to send questionnaires to

- a sample of "small" enterprises (30 employees or less) active in the construction sector
- a sample of enterprises who have their main activity in another sector but do a lot of construction work. Using data from these enterprises implies some double-coverage problems in the economic statistics that have to be dealt with.

3.3.2 Revised form

To get data of sufficiently good quality, it is necessary to make it easy for the respondents to fill in the questionnaires. Possibly it might help to supply the respondents, together with the questionnaire, with additional information and explanations of the contents of the variables asked for. The information can be given on a separate sheet of paper. The respondents should not do the coding of the construction projects themselves. (Perhaps it is not a good idea to send a big book of classifications to each respondent. You cannot be sure that the code-work is done correctly.)

It would be very feasible to include as much as possible of "closed questions", i.e. pre-coded answer-alternatives in the questionnaire.

There is need of a revised new form. Look at the attached proposal.

To make it possible to produce some new statistics on volume variables we also need to ask for some "new"data-variables - additional volume-variables (new floor area, number of new dwellings, number of rooms).

4. DATA FOR ESTABLISHING AN IMPROVED STATISTICS ON BUILDING AND HOUSING

4.1 Survey-data collected from the construction enterprises

To make it possible to establish a new statistics on new built or restored housing units it is necessary to collect some new variables concerning the specific building projects.

Some of these new variables will be added:
    More specified types of building project
    Date of start, month
    If the project is going on during the response period
    Date of completion, month
    New floor area
    Number of dwellings/apartments
    ?Number of rooms per dwelling, mean/in general?
    Number of floors/stories (in the two highest buildings?)
    Definitive costs for the project

The additional data variables might - in case - be collected both in the survey by data-collection from enterprises in the construction sector and in the data-collection on auto-construction works from building permits.

4.2 Variables on Auto-construction in a data-collecting system based on Building permits

Some useful variables concerning the specific building projects fetched from Building permits:

Location   Municipality
Location (geographic) of the building project. Address

Respondent Identity data from building permits or other administrative register. Owner identity (name and address), telephone number or e-mail address

License   Building permit, number
Authorized or just applied for.
Expected time getting the license (month)

Type of   Type of construction work:
project   - **New construction**
       - Civil engineering Infrastructure project: Road, Bridges, Pipeline,
                         Power-structure/-plants, Wells, Other
       - Building projects (Residential buildings, Non-residential buildings and

                            Mixed   residential   and   non-residential buildings)

(Type of building:

Residential	Non-residential	Mixed
Department block	Office	(department block and
Small houses	Shops, hotel, restaurants	non-residential building)
Residences,Villas	Industry, store, storage	
	Education, hospital,	
	nursing, social care,	
	culture, sports, leisure,	
	other official activities	
	Communication, traffic	
	Military use	
	Other building	

   - Rehabilitation
       - Civil engineering Infrastructure project: Road, Bridges, Pipeline,
                         Power-structure/-plants, Wells, Other
       - Building projects (Residential buildings, Non-residential buildings and

                            Mixed residential and non-residential buildings)

Period   Building start, month of expected building start (For licensed projects)
Real date of building start, month building start
Calculated date of completion, month,
Definite date of completion, month

Volume - data	New floor area, M2 Number of stories. This is relevant for new construction of building projects
Costs-data	Calculated costs for the project (at start) Definitive costs for the project The total value for the project
Data on projects	More data on each building projects: Some new variables concerning the specific project will be added. Number of **dwellings/**apartments, total (?Number of **rooms** per dwelling, mean/in general?)
Materials	Specified data on different kind of used and consumed materials per project **-** quantities of used materials **-** costs

It is important to give the respondents additional information how to fill in the questionnaire/list and give explanations of the content of the variables ask for.

Maybe it is even not useful to collect data from building permits concerning auto-construction works of rehabilitation.

5. HOW TO CONTINUE THE WORK TO IMPROVE THE STATISTICS AND TO INVOLVE AUTO-CONSTRUCTION WORKS

5.1 Recommendations

A list of main activities to improve construction statistics

1. Enlarge the coverage of enterprises in the survey on constructing activities. Involve the enterprises active in the construction sector with less than 30 employees. Identify the population of these enterprises and draw a sample from FUE-register (INE) or from a register from MOPH. Get the best possible coverage of these enterprises.

2. Data collection based on projects. This have to be discussed further with MOPH

3. Revise and alter the questionnaire to the enterprises. This has to be done in coordination with other people in INE dealing with new questionnaires.

4. Make it easy for the respondents to fill in the questionnaire. Give additional information to the respondents how to fill in the questionnaire and give explanations of the contents of the variables asked for. Add the information on a separate paper. The respondents should not do the code-work. (Don't send a big book of classifications

to each respondent). Include as much as possible of "closed questions" in the questionnaire, i.e. pre-coded answer-alternatives. Se attached draft questionnaire.

5. Collect additional data to make it possible to produce some new statistics on volume variables. Ask for some additional volume-variables (new floor area, number of new dwellings, number of rooms).

6. Elaborate a new table-plan on housing statistics and publish statistical data on volume variables, for example number of different types of projects, new floor area, number of new dwellings, etc.

7. Investigate the possibility to cover licensed auto-construction works by a sample survey. The respondent in the survey may be Municipality Councils.

8. Investigate the availability of valid data-variables in building permits, in each municipality.

9. Investigate the quality of data available in building permits.

10. Do a new form/questionnaire for collecting data of licensed auto-construction projects, merely based on data catched from building permits. The form/questionnaire can be like a list of new projects. It will be sent the Municipality Councils.

11. Make an additional paper to the questionnaire, with information and instructions how to fill in the list/questionnaire, easy to understand.

12. Do a pilot study for collecting data on licensed auto-construction projects if aggreed so with MOH.

13. Evaluate the costs for such a survey.

14. Find ideas how to evaluate indicators or indexes on the amount of illegal auto-construction works (without a license) for every municipality. Continue the the strains to the utmost to find a feasable method. to determine the volume of the unlicensed auto-construction works

15. Do a pilot study for collecting data on unlicensed auto-construction works. Evaluate the result of the study before taking decision to implement a permanent survey.

5.2 Need of another mission

There are some needs of a new mission to continue the investigation work and to elaborate:
 - methods and forms to collect data on auto-construction works, both legal and illegal projects

- methods to improve statistics on Housing volume-variables based on data collected from the enterprises (by questionnaires) in the construction sector and data from building permits (administrative data).

6. EXECUTIVE SUMMARY

Start the job of improving statistics on construction works with the legal auto-construction projects by collecting feasible data from building permits and leave the rehabilitation works of auto-construction outside so far.

APPENDIX 1

Terms of Reference for a short-term mission
              on

Construction Statistics

11 – 28 November, 2003

within the Scandinavian Assistance to Strengthen the Institutional Capacity of INE/Mozambique, 2003-2007

Consultant: Inga-Maj Rasmusson, Statistics Sweden

Counterparts: Jõao Loureiro and Natercia Macuacua

1. Background

The construction sector is often highly affected by the ups and downs in the business cycle, and is therefore a good indicator to describe and monitor the economic activity in a country. Construction of Buildings constitutes an investment in fixed capital that directly contributes to the Gross National Product. Users of construction statistics are the Government, Non-Governmental Organizations, International, Organizations, University, Educational Institutions, Public and Private entities and the public in general.

Today there exists some statistics on this area. INE conducts a monthly survey within enterprises that according to INEs Business Register operates mainly within the construction sector. Data collected are value-data on specified construction activities (new and rehabilitation) on residential and non-residential buildings, roads, bridges and other infrastructure. Also the monthly value of remuneration, number of employees and turnover are variables asked for in the survey. MOPH (Ministério de Obras Públicas e Habitação) also collects data from the construction sector to help them monitor and plan activities within the sector. Information is collected both from public institutions and from private firms that operates in the sector.

2. Main reasons for the mission

Even if there exists some statistics within the construction sector the quality of the information collected is low, and also it does not cover all areas within the sector. Especially there is a lack of information concerning informal *building- and housing activity i.e. done by individuals and not companies.*. This type of construction activity is often done trough what is often called *auto-construction*.

The objective of a mission will be to assist INE in improving the construction statistics as a whole. This will imply both reviewing and develop further the existing survey, and to suggest methods of producing building statistics that includes auto-construction. Focus should be put on finding methods to cover the building- and housing part of the construction sector.

3. Benefactors of the mission

The mission will benefit the users of construction statistics through improved coordination. INE-staff working with construction statistics will improve their qualifications on such as how the construction sector functions.

4. Specific objectives of the mission

- Investigate further the possibilities of producing building statistics that includes auto-construction.
- Review administrative data sources on auto-construction (coverage and quality of data), and the need for additional data collection trough survey
- Suggest methodology to determine the "real" construction volume within the Building and Housing sector. The idea is to establish an index for missing permits in different areas.
- Evaluate the current methodology-, processing- and dissemination routines used to produce construction statistics, and suggest improvements.
- Prepare a work plan for implementing a complete building statistics, based on the general plan already prepared by INE and the work done during the mission.
- Lectures/discussions about construction statistics (definitions and concepts, methodology and common indicators)
- Training of INE-staff in producing good quality construction statistics.
- Meetings with users of construction statistics and MOPH to inform about INEs plans for a new statistics, and to determine their needs.

5. Expected results

- Assist INE to arrive to map and assess possible data sources and give suggestions on what sources to use in a new building statistics
- Assist INE on a method to determine the "real" construction volume.
- Assist INE on a plan for implementing a new building statistics that includes auto-construction
- Assist INE on how to evaluate the current monthly survey within the construction sector give suggestions on improvements
- Give proposal on timing and contents of a following STA within the Scandinavian Program

6. Agenda for the mission

To be prepared by INE, but should include the following
- An initial meeting with the President of INE
- Meeting with the Ministry (MOPH)
- Meeting with the Users of Construction Statistics
- In-house training/discussions about construction statistics

- A seminar towards the end of the mission to present and discuss the results and recommendations

7. Tasks to be done by INE to facilitate the mission

- Elaborate ToR for the mission
- Prepare and supply the consultant with relevant documents and information, such as

Draft Report: *"A plan for a new construction Statistics"*. March 2003

- Supply good working conditions for the consultant

8. Consultant and Counterpart

Consultant: Inga-Maj Rasmusson Statistics Sweden
Main counterparts:
João Loureiro, President of INE
Azarias Nhanzimo – Director of Directorate for Sectorial Statistics and Business Statistics
Natercia Macuacua, Head of Department for Statistics on Goods and Environment
Matilde Chiulele, The same Department

9. Timing of the mission

The mission will take place 11/11 – 28/11, 2003

10. Report

The consultant will prepare a draft report to be discussed with INE before leaving Maputo. He/she will submit a final draft to INE for final comments within one week of the end of the mission. Statistics Denmark as Lead Party will print the final version within 3 weeks of the end of the mission. The structure of the report should be according to Danida format.

The Counterpart has to ensure that the final printed report has at least a summary in Portuguese if the main report is in English – or vice versa.

Appendix 2

See Excel-sheet (can not be implemented in Word).