Crisis Monitoring and Response System (CMRS)

Summary Report

September 2010

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1 Introduction

Origin and Objectives

In January 2009, the Government of Indonesia (GOI), through its National Development planning Agency (Bappenas), decided it would develop a Crisis Monitoring and Response System (CMRS) to determine the impact of the global economic crisis (GEC) on Indonesia over the course of the following year. The general aims of the CMRS were to generate data to assess the impact of the crisis and to identify the policy responses appropriate to alleviating the effects of the crisis on the poor and vulnerable.

A key component of the CMRS was a quarterly household survey, termed the CMRS Survey (CMRSS), conducted by the Central Bureau of Statistics (Badan Pusat Statistik, BPS). Its distinguishing features were that it was quarterly, that it collected indicators not otherwise available, and that was conducted in conjunction with an existing semi-annual BPS survey on labor and employment (Sakernas) but with much faster processing. Three rounds of the survey took place.

Terminology

In this context a *crisis* is defined as the effect of a *shock,* or a more gradually deteriorating situation. It can be caused by a natural event such as disease or earthquake, or human related, resulting from financial or political turmoil, or conflict. It can develop quickly following a shock, as in the case of a tsunami, or over a longer period as conditions gradually worsen, for example, as the result of a prolonged drought. The effects of a crisis can be felt country-wide, as in the case of food or fuel price increases or can be confined to specific regions, for example those affected by flooding, landslide, or earthquake. The particular crisis that initiated the CMRS was the GEC.

For CMRS purposes, a district that was substantially affected by the GEC was defined as being *in crisis*. This status was determined by adverse movements in a number of relevant indicators. An *adverse movement* was defined as one that was in the direction of the district being *at risk* from crisis effects. Examples of adverse movements are reduction in average hours worked, reduction in rice consumption, and increase in child employment. A sufficiently large adverse movement in an indicator in a district led to the assignment of a *red risk flag* for that indicator for that district. A sufficient combination of risk flags resulted in the district being declared *in crisis*. As there were no benchmark estimates of quarterly change for any indicator, the levels of change considered *sufficiently large* to result in the assignment of risk flags had to be determined empirically, as did the *sufficient combination* leading to a crisis declaration.

Pre-Existing Sources of Data

Two pre-existing, regular sources of data were identified as potentially useful for crisis monitoring: first, data produced by BPS, in particular from Sakernas and from the national socio-economic survey (Susenas); and, second, administrative data available from other government departments and agencies, in particular, data related to the provision of health related government services provided by community health posts (Posyandu) and health centres (Puskesmas), and reported by district health offices (Dinas Kesehatan).

Sakernas and Susenas data were semi-annual and thus not of sufficient frequency to meet CMRS data needs. Moreover, data were available only 6-8 months after collection. Health data were collected monthly and hence a potentially useful source.

CMRS Components

The indicators required for monitoring that were not available from these sources became the target of a new household survey referred to as the CMRS Survey (CMRSS). The distinguishing features of the CMRSS were that it was quarterly, that it collected indicators not otherwise available, and that was conducted by the BPS under contract in conjunction with the existing BPS semi-annual labour and employment survey (Sakernas) but with much faster processing.

The CMRSS was the first, and major, component of the CMRS. The second component was the collection of health data from the community health centres (Puskesmas) and district health offices (Dinas Kesehatan).

Complementary Qualitative Crisis Monitoring and Analysis

Complementary to the CMRS was a qualitative analysis conducted by SMERU, the intention being to provide a deeper understanding of the phenomena responsible for the observed changes. The idea was to confirm (or not) CMRS results in specific areas, to suggest the possible causes and trends, and to help in determining the potential effectiveness of various policy responses.

Purpose and Content of Document

The document is intended for all the organisations and individuals that were stakeholders in the CMRS. Its primary goal is to summarise CMRS design, development, and operations covering the period from January 2009, when the CMRS was initiated, until September 2010 when the final CMRS were completed. It includes the results of analyses based on the data collected and relates them to the GEC. Finally, it contains an evaluation of the key aspects of the CMRS and discusses the possibilities for institutionalising a crisis monitoring system in the future.

Further details and links to other reference documents are available in a companion report entitled *Crisis Monitoring and Response System Detailed Report*.

2 CMRS Management and Roles

Client

The primary CMRS client was Bappenas, in particular, the Division for Evaluation of Development Performance and the corresponding operational division.

Development and Analysis Team

A World Bank (WB) Team from the Poverty Section of the Jakarta Office took overall responsibility for the design and development activities including planning, budgeting and managing the contracts, and for data analysis and presentation of results to the client.

Data Collection and Capture Contractor

BPS was contracted to collect and capture the CMRSS data in accordance with the sample and questionnaire design and to collect health data. The contract involved three rounds of data collection by CMRSS questionnaire, and from the district and sub-district health offices. The rounds were conducted, in August 2009, November 2009 and February 2010. The August and February rounds accompanied the biannual Sakernas; the November round was standalone.

There were also three quarterly rounds of health data collection. Each round collected the values of 76 indicators for each of the three months in the quarter. In each district, five community health centers (puskesmas) were surveyed, along with the district health office. If the number of community health centers in a district was less or equal than five, then all community health centers in that district were surveyed.

Consultants

The World Bank Team was supported by four consultants.

- A local consultant was Project Manager with responsibility for day to day planning and administration of the CMRS and monitoring operations.
- An international Statistical Consultant guided development and implementation of CMRSS design requirements, questionnaire, sampling plan, data analysis framework, and quality assurance.
- A local consultant was responsible for the editing, weighting, aggregation and analysis programs
- A local IT specialist developed the dissemination systems for CMRS and other vulnerability and crisis monitoring programs and studies.

Core Analysis Team and Analysis Review Group

To assist in the analysis and review of data from the second and third rounds, the Core Analysis Team (CAT) and Analysis Review Group (ARG) were constituted in February 2010. The role of the CAT was to develop analysis methods, to analyse the data and to present the results. The role of the ARG was to review the analysis methods and results.

Funding Agency and Budget

Funding for the CMRS was provided by AusAID. The level of funding determined the scale of the CMRS. It was sufficient to support three rounds of a survey collecting data via a relatively short questionnaire from about 15,000 households. The WB Team reported to AusAID after each round of data was analysed.

Other Stakeholders

Other CMRS stakeholders included the international and national organisations interested in poverty reduction and growth of the economy, in particular SMERU, which was conducting the qualitative study, and the UNDP.

3 CMRSS Design

3.1 General Design Considerations

Specific Objectives

The objectives of the CMRSS were succinctly summarized as follows.

The objective is to implement a low-burden household survey collecting data on household education, health and employment to identify districts requiring a specialized policy response to alleviate impacts of the current economic crisis. Requirements are that the survey be frequent (say, quarterly), low burden (low cost to put into the field, low technical capability required in the field, low processing cost), quick to turn around from fielding the survey to having the indicators available and digestible, and having national coverage but being representative at the kabupaten level. The intention is for a short, one to two page questionnaire. A key obstacle is that it is difficult using traditional cluster sampling techniques to get national coverage and be kabupaten representative, while also being low cost.

Coverage Considerations

Specifying the required coverage of the CMRS in terms of the level and number of administrative units for which data were collected was a critical aspect of the CMRS design. It was decided that the level of unit at which crisis monitoring was to take place was the *district*.

The client expressed a desire to *cover all districts equally*. The justification was as follows. Districts that could be reasonably expected to be in crisis on account of their dependence on exports (or other factor likely to have been affected by the GEC) could readily be identified and examined through qualitative research. To complement such research had to be able to identify any other district that was in crisis.

As there were 471 districts in 2009 (the number increased to 494 in 2010), a total CMRSS sample size of about 15,000 households meant a sample of about 30 households per district.

Content and Frequency Considerations

It was assumed that structural differences between districts, as manifested in differences in levels of the various indicators across districts, were already known based on existing sources and that these differences had already been taken into account in formulating and implementing the ongoing policies. Thus, the main focus of the CMRS was *negative movement at district level* in the indicators identified as useful for crisis monitoring**.** Production of levels and changes at provincial and national levels was acknowledged as a valuable by-product, and a guide to district analysis, but not the primary target.

The fact that the CMRS aimed to measure effects of the GEC as it evolved implied a requirement for indicators on a monthly or quarterly basis. As the budget was sufficient for only three rounds of the CMRS, and in view of the time required to process the data, it was decided that the indicators would be collected *quarterly*. Even if there had been a budget for nine monthly rounds, it would likely have been better spent in conducting a quarterly survey with three times the sample size, or with twice the sample size for four quarters.

Relationship to Existing BPS Surveys

A standalone survey would have been expensive and wasteful of resources, hence the CMRSS was conducted as a subsample of, and piggy-backed on, an ongoing BPS household survey. There were two possible BPS surveys that could have served this role, namely, Susenas and Sakernas. Of these two, Susenas would have been the more natural vehicle in terms of data content. However, the June 2009 round of Susenas was in the field before the CMRSS design could be completed, which meant that Susenas was not a feasible option. Thus Sakernas was selected as the carrier survey, with the first round being August 2009. It is a semi-annual survey conducted in February and August, actually comprising two samples, namely a *district (annual) sample* producing national, provincial and district level data for August and a *provincial (semi-annual) sub-sample* producing national and provincial level data for February and August.

Choice of Panel Design

The benefits of cross-sectional sample design for the CMRSS would have been that data could have been added or averaged across quarters to produce annual level estimates at district level of acceptable precision, also there would have been flexibility to adjust to new coverage needs, for example larger sample sizes in selected districts, on a quarterly basis. The benefits of a panel design were simpler field operations and higher precision estimates of quarterly change than a cross-sectional design. Given that the focus of the CMRSS was producing estimates of change, *a panel design was selected as being far and away preferable to a cross-sectional design.*

Respondent Recall for First Round

For the first (August) round, measures of quarterly change were obtained by asking the respondent to report values of the indicators for a reference period one quarter earlier (May) as well as for the current period. This was not ideal as it involved respondent recall and the likelihood of increased reporting error, but was the only solution.

With the exception of a small number of districts not covered in the first round, there were no questions requiring respondent recall in the second and subsequent rounds as data from the previous round were available.

Lot Quality Assurance Sampling Approach

Lot quality assurance sampling (LQAS) is an appropriate technique for determining whether the coverage (expressed as a proportion associated with a binary indicator) in a population of units of interest is acceptable or not based on a small sample (referred to as a lot) drawn from the population. It is typically used where the sample size is too small to produce reliable estimates of coverage for individual small regions of interest. For example the coverage may refer to the immunization of children in each district in a particular country, and 80% may be designated as an acceptable level and 50% unacceptable.

Consideration was given to applying the LQAS approach directly to the classification of districts as at risk or not in terms of each binary indicator, for example, employment rate. This would have meant identifying an acceptable level of change in each indicator. There were two reasons why this approach was not adopted. First, the change in a binary (0,1) indicator is not itself a binary indicator as it can have three values (-1, 0, +1). Second, there was no basis for specifying acceptable levels of change. Thus, LQAS was not directly used. However the approach adopted was in the spirit of LQAS

in the sense that, given the very small sample sizes and consequent low level of reliability of estimates at district level, the results were summarised in the form of district risk flags rather than as (unreliable) estimates.

3.2 CMRSS Sample Design

Sakernas Sample Design

As the CMRSS sample was a subsample of the Sakernas sample, the starting point was the Sakernas sample design, which, up to and including August 2010, was a stratified two stage cluster design.

The primary sampling units were census blocks (CBs) which carried population and household counts as measures of size for sample selection and estimation. There were in the order of 500,000 CBs in total across 471 districts in 33 provinces. The CBs were divided into urban and rural strata within each of which they were systematically ordered within each district according to their relative geographic locations. The districts themselves were systematically ordered in a standard sequence within provinces, which themselves were ordered in a standard sequence. As all sampling was done using systematic selection, the net result of the ordering was to produce implicit stratification by province and district and by geographic location within district.

The second stage sampling units were households. There were some 60,000,000 households in total which on average contained about 4 persons per household for a total population in the order of 240,000,000.

The annual sample was designed to produce district level estimates. The CBs were allocated to districts such that there were between 30 and 60 CBs in almost all districts, thus giving estimates of similar precision across districts. Within each stratum, within each district, the first stage sample of CBs was independently, systematically selected with probability proportional size (pps). Within each selected CB, households a second stage sample of 16 households was selected using systematic random sampling for a total of some 293,088 households.

The semi-annual sample was a subset of the district sample of CBs and households and was designed to produce provincial level estimates. Within each stratum, within each province, the first stage semi-annual sample of CBs was independently, systematically selected from the annual sample of CBs. Within each selected CB, the second stage sample comprised the 16 households giving some 69,824 households in total.

A rotation plan ensured that no household remained in sample for more than two years.

CMRSS Sample Design

The aim of CMRSS sample selection was to create a panel sample that:

- was a subsample of the Sakernas August annual sample;
- was a pps sample at district level and hence self-weighting at district level;
- had maximum overlap with the Sakernas February semi-annual sample

Designing the sample for district level estimates of equal precision required an equal number of households (say m) in each district. Also, for simplicity of implementation, the number of CBs per district (say n) had to be the same. Analysis of the options suggested that a sample allocation of n=5 CBs by m=6 households provided an

optimum balance between (i) the desirability of a low m for maximum precision, (ii) an m that reflected a day's work in the field, and (iii) a low n to minimise the number of CBs not in the February semi-annual sample.

Within each CB, a systematic sample of 8 households from amongst 16 households in the Sakernas sample was selected. From amongst these, six were systematically selected to be the main CMRSS and the remaining two formed the reserve sample for use in the event of sample attrition over time or persistent non-response.

3.3 CMRSS Questionnaire and Indicators

Content and Layout

The content and layout of questionnaire were designed to best suit data collection in the districts and data capture at Head Office. This meant:

- ensuring the questions were readily understood by the interviewer and by the respondent - using commonly understood terminology, providing definitions and explanations where needed, and using question wordings that had been used before, in particular by Sakernas or Susenas;
- ensuring the questions could be readily answered by the respondent – avoiding asking for too much detail or for data that the respondent could not be expected to know without reference to household accounts or keeping a diary;
- avoiding sensitive questions, that is questions that the respondent might not have wished to answer, for example self employed income and assets;
- ensuring that the answers could be readily recorded by the interviewer and subsequently captured by the data entry clerks – for example by ensuring answer boxes were sufficiently big and well spaced to allow easy entry of the responses.

In principle, the aim was to use exactly the same questionnaire for all three rounds so as to have exactly comparable data for three quarters, with the exception that, in the first round questionnaire only, additional questions were asked about the quarter earlier. In practice, some minor modifications had to be made between rounds for clarity and to eliminate obvious mistakes.

Testing

Testing of the questionnaire before the first round was very rudimentary in view of the exceptionally tight timeframe. It comprised focus group testing at Head Office, which resulted in significant changes in content and improvements in question wording and layout.

Derivation and Types of Indicators

There were basically two ways in which the indicators actually analysed were obtained from incoming CMRSS data. In the simple case, the indicator reflected precisely the value recorded in response to a question on the CMRSS questionnaire, for example, *monthly household consumption of rice*. In the more complicated case, the indicator was *derived* from responses to one or more questions, for example *employment status* (employed, not employed, not economically active) was derived from a series of questions regarding activity during the previous week.

For processing and analysis purposes the indicators were viewed as being of two types.

- *Quantitative (numeric)* indicators defined as having a value set that is expressible as an interval of real numbers or integers, for example, income, weekly hours worked, and number of meals per day. The values of a quantitative indicator over the population or a sample can be added and averaged to give a total and a mean.
- *Categorical (non-numeric)* indicators defined as having a value set (set of categories) that is not quantitative, for example, *status in main job* (self employed/ runs own business/ employee, etc), *ease of meeting education costs compared with a year ago* (much easier/ easier/ slightly easier etc), and *experiencing difficulty meeting everyday cost of living* (no/yes). Aggregation over the population or a sample gives counts and proportions for each category.

The categorical indicators for which the set of categories was ordered were converted into numeric indicators by assignment of an ordered sequence of integers to the categories and then averages can be meaningfully computed. For example, *ease of meeting education costs* was converted to six point scale (1, 2, 3, 4, 5, 6). A mean of 3.5 then implied the corresponding population was centred on the mid-point of the scale.

A *binary* indicator is a special case of categorical indicator with two possible values, for example *experiencing difficulty meeting everyday cost of living* (no/yes). All binary indicators were converted to numeric indicators by assignment of the numbers 0 and 1 to the categories, following which the mean was the proportion of the corresponding population in the category with to which the value 1 had been assigned.

Thus, all the CMRS indicators subject to analysis could be treated as numeric.

The metadata containing the precise meanings and derivations of all indicators (including those obtained from the health data sources), and the changes made in those indicators between rounds, were comprehensively documented to ensure that subsequent analysis was conducted on a sound footing.

3.4 Data Collection, Capture and Processing

Three Rounds of Data Covering Four Quarters

The first round of the CMRSS was conducted in August 2009, collecting data for August 2009 and May 2009 reference periods. The interviewed households were part of the Sakernas annual sample, and the survey was conducted in the form of additional data collection for the 30 households within each district that belonged to the CMRSS sample.

The second round was conducted as a stand-alone survey in November/December 2009, collecting data for the November 2009 reference period.

The third round was conducted in February 2010, collecting data for the February 2010 reference period. For the most part, the interviewed households were in the Sakernas semi-annual sample.

Handling Non-Response

Interviewers followed up as many non-responses as possible during the first week. Even so, non-response usually prolonged data collection activities into the following weeks.

At national level the response rates were good (85% or more). There were some districts and provinces where response rates were poor.

Data Transmission, Capture, Checking and Storage

The completed questionnaires were sent to Head Office by regular mail. In view of non-response and the need to follow-up those households, most districts made a second mailing to Head Office, several weeks after the first.

Data from the completed questionnaires received at Head Office were captured by teams of BPS clerical staff well in advance of and separately from Sakernas data. They were subject to rudimentary checks during data entry.

Data Preparation

The captured data were brought into a STATA database, linked across rounds, reformatted, edited, and aggregated prior to being output into Excel spreadsheets for analysis.

Data for the same household across rounds were linked using head of household name. This was a tedious and time consuming process requiring manual intervention. It could have been easily avoided if the original data had included a unique household identification code across all rounds,

Reformatting included derivation of indicators such as employment status and conversion of all of the indicators subject to analysis to numeric.

In view of the limited time and resources editing it was minimal. It was easy to spot and correct some unlikely values in quantitative indicators, for example, values of 0 or 8 meals per day, or huge consumptions of rice by value (suggesting values recorded in units rather than thousands of rupiah). Errors in binary indicators for any given quarter could not be detected and corrected. Period to period movements in some indicators showed some anomalies. For example, in some districts there were incredible quarterly swings in the numbers of households with females working, and these swings were in both directions.

3.5 Aggregation and Estimation

Estimates of Quarterly Levels

As the CMRSS sample was approximately self-weighting, the estimator of the level (mean value) of each indicator for each quarter was estimated using the same formula as for a simple random sample.

As the sample design was complex – a two stage cluster sample – the formula for a simple random sample was not appropriate for estimates of the variances and standard errors of the level estimates. The SVY option in STATA was used to take the sample design into account.

Estimates of Quarterly and Six-Monthly Movements

There were two options for computing estimates of period to period movements (i.e., change in mean value).

1. Base the estimate on all observations for each period. This option includes observations from households that were present in the earlier period but not the later one (exits) and from households that were not present in the earlier period but were present in the later one (entries). The estimate of movement is simply the difference of the estimates of level for the two periods.

2. Base the estimate on the *paired* observations only, i.e. observations from the same set of households for each period. This option excludes entries and exits from the calculation. The estimate of movement is the difference of the estimates of level for the two periods *based only on the households providing data for both periods*. Equivalently it is the mean value of the *changes in level* for these households

Estimates were computed using each option and referred to as *overall* and *paired only* estimates respectively.

Given the complex sample design, the estimate of the variance of the paired only estimator of movement was calculated from the changes in level for the common households using the SVY option in STATA (just as for the variance estimate of the estimator of level). This same approach could not be used for the variance of the overall estimator. In fact this variance could not be readily calculated using STATA. However, approximate upper and lower bounds could be computed.

- The lower bound was the estimate of the variance of the paired estimator - in the case where some observations were not paired this will almost invariably have given an underestimate.
- The upper bound was the sum of the estimates of variance of the level estimators for each of the two periods. This would have been exact under the assumption that the corresponding samples of households for the two periods were completely independent. As the samples were, in fact, heavily overlapping, this will almost invariably have given an overestimate.

Scaled and Probability Estimators Associated with Movements

A scaled version (also called a *z-score*) of each period to period movement estimate was computed as the estimate divided by the estimate of its standard error. Under the assumption that the movement in the population was actually zero, this estimator had an approximately Normal (0,1) distribution. Thus, it provided an indication of the significance of the movement on a standard scale. In calculating the z-score the main issue was the calculation of the variance, the two options being as noted above. Values using each option were computed.

For each period to period movement estimate, the *p-value* was defined as the probability that the observed value, or a more extreme value, could have been obtained at random under the assumption of zero movement in the population. It was computed using the paired estimates.

Where all the observations were paired, or where only where paired observations are used in the calculations, the z-score and p-value are in 1-1 correspondence as the p-value is simply the probability of observing a value equal to or more extreme than the z-score.

4 Analytical Framework

4.1 Aims of Analysis

As the basis aim of the CMRSS was to pick up impacts as soon as they occurred, the primary focus of the analysis was on *quarter to quarter movements in an adverse direction*. However, given the data were experimental, attention was also paid to levels, especially as they provided a basis for assessing subsequent changes.

Analysis at National Level

The primary aims of analysing data at national level were:

- to identify indicators that showed *significant adverse movements* between the current quarter and earlier quarter, to quantify those movements, and to suggest possible causes and consequences;
- to identify variations (if any) in the movements in these indicators by rural/urban breakdown, poor/non-poor breakdown, and head of household sex breakdown.
- to summarise the levels of, and movements in, indicators for which data were not recently available from other sources.

Secondary aims (largely not achieved) were:

- to quantify the *current quarter movements* in indicators that *in the previous quarter* showed significant adverse movements, and to suggest possible causes and consequences;
- to identify indicators that showed significant adverse movements relative to earlier *benchmark* data, to quantify these movements, and to suggest possible causes and consequences.

Analysis at Provincial Level

The primary aim of analysing data at provincial level was to classify provinces into groups reflecting the extent to which they mirrored the adverse movements observed at national level and to identify the provinces that appeared to be most *at risk* in the sense of having more adverse levels of indicators than the national averages. The secondary aim was to summarise the levels of and movements in indicators for which data were not recently available from other sources.

As sample sizes were much smaller at provincial than national level, no attempt was made to explore rural/urban, poor/non-poor, and sex breakdowns.

Analysis at District Level

The primary aim was to identify districts that were *in crisis* as evidenced by *significant adverse movements* occurring in several indicators.

4.2 Analysis Procedures

National Level Data

67 indicators were analysed, focusing on those that showed significant adverse period to period changes. For ease of interpretation, and as illustrated in Figure 4.1, the indicators were analysed in four groups – *labour market, household economics, coping,* and *outcomes* - that model how the GEC might have impacted on labour market conditions and household economics, how individuals and households might have coped with adversity, and what possible impacts could have been on outcomes.

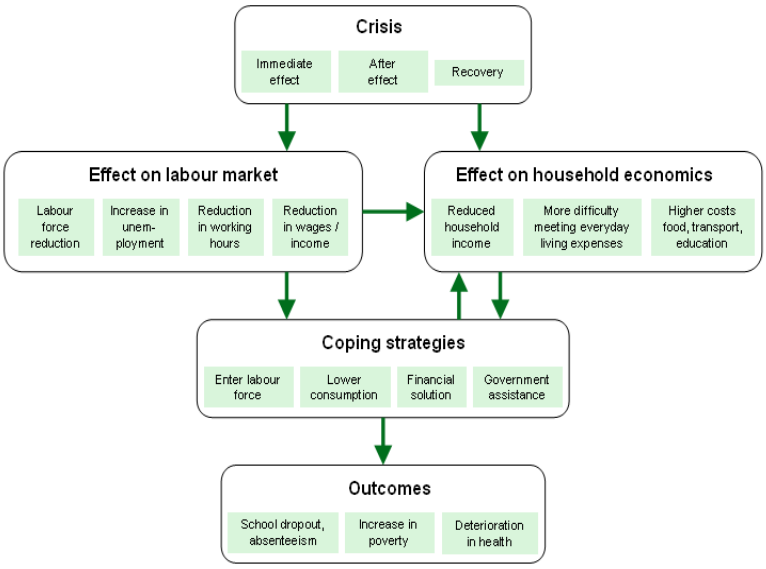


Figure 4.1 Groups of Indicators in Context of Crisis Monitoring

Provincial Data

In view of the large number of indicator-province combinations, analysis was focused on those indicators that showed significant period to period changes at national level. The selected indicators were grouped in two broad categories reflecting the overall extent of the movements relating to *labour market impact* and *household hardship*. The labour market dimension included HoH working hours, HoH unemployment and HoH labour force participation. The household hardship dimension included household income, difficulty meeting consumption costs, and substitution of lower quality or cost lauk-pauk (main protein accompaniment to rice).

For each consecutive pair of quarters, for each dimension, each province was classified as reflecting the national average (*average*), or a more adverse effect than the national average (*bad*), or a less adverse effect (*good*). Thus provinces were divided into nine cells according to whether labour market changes were generally *good, average or bad* and whether the household economics/coping situation was generally *good, average or bad*.

For the purposes of further summarising differences in the provincial patterns of period to period changes, the provinces in the nine cells were then further clustered. For example, for the July-October comparison the groups were:

- Group 1: Labour Market good; Household Economics/Coping good or average;
- Group 2: Labour Market average;
- Group 3: Labour Market bad; Household Economics/Coping good or average;
- Group 4: Labour Market bad; Household Economics/Coping bad.

District Data

Given the very large number of district-indicator combinations, attention was focused on those indicators that showed significant adverse movements at national level and/or were considered reliable, and/or were based on 20 or more households per district.

Because of the small sample sizes and resulting large standard errors, district level estimates of level and movement were not considered to be informative to clients. Instead, for each district the data were summarised in the form of a district *in crisis flag* that was set to *red* if the district was believed to have been severely impacted, to *orange* if there was some evidence of impact, and otherwise not set. The in crisis flag was a composite indicator derived from the values of *at risk* flags for individual indicators for the district, using an *in crisis composition rule* as further explained below.

For each district, a significant adverse movement in an indicator was highlighted by setting the corresponding district-indicator *at risk* flag according to the *risk identification rule* for that indicator. There were many possible rules and no theoretical basis for choosing the best. Different rules could be used for different indicators. Every rule involved ranking districts according to the movement in the indicator, or its scaled value (z-score) or its p-value, and designation of those districts with the most adverse values as *red* or *orange*, according to the value.

In essence, the rules used were in all the form of a one sided hypothesis test (with some particular level of certainty), the null hypothesis being no significant movement in an adverse direction, supplemented by the requirement that the (scaled) movement exceeded some particular threshold. The appropriate choices of level of certainty and threshold value were determined empirically for each indicator.

The aim of the district in crisis flag was to summarise the information about the impact of the crisis on a district that was conveyed by the individual indicator at risk flags. The simplest type of crisis composition rule was of the form:

- set district in crisis flag to *red* if number of *red* (or *red* + *orange*) risk flags for district exceeds a specified threshold;
- set district in crisis flag to *orange* if it has not been set to *red* and if the number of *red* (or *red* + *orange*) risk flags for district exceeds a smaller specified threshold;
- otherwise, do not set the district in crisis flag.

More sophisticated variants of this rule could be derived by weighting the indicators and/or requiring the district to be in a province that was classified as at risk, etc. As there was no way of deducing a best or optimum rule a number of different rules were tried over the three rounds of data.

4.3 Distinguishing Crisis Effects from Other Effects

Given the data were obtained by observation and not from a controlled experiment, care was taken in attributing causality. There was often insufficient information to distinguish between two or more possible causes. In particular, there was often no way of knowing whether changes were due to crisis after effects, seasonal effects, or other trend-cycle effects. A typical time series model for monthly or quarterly indicators allows for the following systematic effects:

- *Trend*: long term movement in one direction, usually growth;
- *Business cycle*: often combined with trend into *trend-cycle*;
- *Seasonality*: cyclical movement following seasonal pattern;
- *Trading day*: effect of weekends, national holidays, numbers of trading days per month.

These *systematic* effects are accompanied by a *random* effect, being the net result of many different little effects, including measurement errors, that average out to zero.

On top of these, the CMRS introduced two additional effects:

- *In-Crisis*: being defined as the effect of a shock or more slowly deteriorating situation, resulting in significant change, usually negative, in economic situation;
- *Crisis Recovery*: restoration to more normal situation following a crisis.

In concept, the effects of a crisis can be distinguished from other effects by being too abrupt to be trend or business cycle, by not being connected with seasonal patterns or trading days, and by being too large and uni-directional to be considered random. In practice identifying the effects of a crisis (in particular the GEC) was not easy as three rounds of data were nowhere near sufficient to determine trend cycle, seasonal or trading day effects for any indicator. Identifying crisis recovery was even more difficult as recovery could be short and/or long term and might blend imperceptibly with trend, business cycle or seasonal effects

5 Collection and Analysis of Health Data

5.1 Sources, Collection, Capture and Preparation

For each of the three quarterly CMRS rounds, data were collected from the district health office (*Dinas Kesehatan* and a sample of five community health centres (*Puskesmas*) in each of the 471 districts. The sample was not random. It comprised the centres that were most easy to reach by BPS field office staff.

BPS field office staff usually dropped off questionnaires at the health office and community health centres and picked up the completed forms a day or so later. Each questionnaire asked for data for each of the preceding three months. The data items including supply side data such as numbers of doctors, paramedics, equipment, as well as usage and health conditions. In total, the questionnaires generated 76 indicators for each of nine months.

BPS Head Office staff captured the data and the BPS members of the Core Analysis Team (CAT) were responsible for preparation and analysis of the data. This involved data consistency checking, missing value imputation, and identifying records that were sufficiently reliable to be used in the analysis.

5.2 Data Analysis

Examination of health centre data for the first two rounds showed considerable data inconsistencies between the two quarters. For many indicators, the average across the three months covered by the second round was more than half as large again, or less than half as large, as the average for the three months covered by the first round. This applied even to indicators such as number of doctors, which could reasonably be expected to be very stable over six months. On the other hand, within each quarter there was relatively too little variation across the three month periods to be plausible.

It was conjectured that the main reason for the quarterly inconsistencies in the data were that the numbers of reports received from the community health centres that were included in the district report differed from quarter to quarter. Under this hypothesis

data from individual community health centres should have been much more consistent from quarter to quarter. It was found that they were not.

The conclusion was that the district health office and community health centre data were of exceptionally poor quality and that there was little point in analysing them further or including them in crisis monitoring

6 Summary of CMRS Findings

6.1 Context

CMRS data have to be interpreted within the context of the prevailing economic environment. The Indonesian economy has enjoyed a solid recovery from the global economic crisis (GEC) beginning late 2008. Robust domestic consumption helped the Indonesian macro-economy to weather the storm.

- The effects of the GEC on the Indonesian economy began in late 2008. A slow recovery was underway by the second quarter of 2009. Exports fell sharply in the fourth quarter of 2008 but recovered through 2009. Growth in GDP also slowed in the fourth quarter of 2008 and into the first quarter of 2009.
- Financial markets were also affected but recovered strongly.
- Since July 2009, households have faced increasing food prices. BPS data show increases in a number of food staples over the second half of 2009. This put considerable pressure on household expenditures, particularly for the poor, for whom food represents nearly three quarters of their consumption.
- The labor market was expanding through to near the end of 2008. Much of the growth was in casual and unpaid work. The trend of gradual recovery is expected to continue to the end of 2011.

In summary, it is certain that the initial impact of the crisis took place well before April 2009, the first quarter for which data have been collected by the CMRSS. Thus the CMRSS results do not show, and cannot be expected to show, the initial impact of the financial crisis. However, they can be expected to show after effects. These could be continuation, perhaps even worsening, of difficult times, or signs of recovery.

6.2 Impact of Crisis at National Level

Summary

In very general terms, analysis of CMRS data at national level indicated some adverse effects that may have been due to the GEC over the period May to July 2009, followed by some evidence of recovery over September to November, and little or no evidence of GEC effects for November to February. A selection of findings that support this conclusion is presented in the following paragraphs.

Head of Household Labor Force Participation

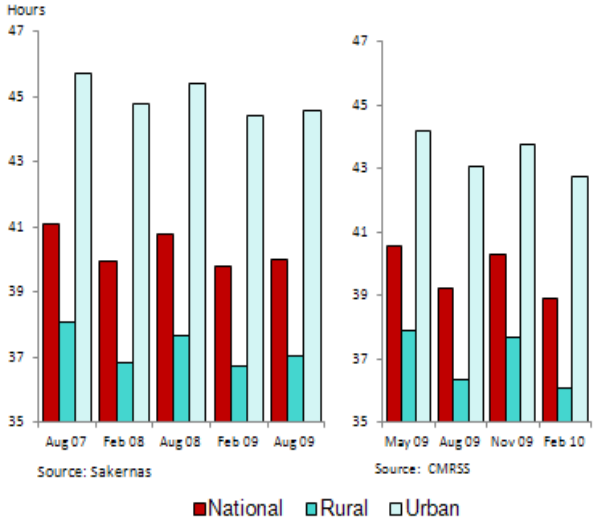
The CMRSS data indicate a small decrease in the proportion of heads of household who were economically active over the period May-August 2009, an increase over August-November 2009, and a decrease over November 2009 - February 2010. Over the period July 2009 - January 2010, the movement was not significant. This suggests minimal or no impact of the GEC on head of household labor force participation rates.

Head of Household Unemployment

Sakernas data indicate that head of household unemployment was highest in the first half of 2008, and was more pronounced in urban than in rural areas. The GEC did not appear to cause an increase in unemployment; in fact, unemployment fell over the period May-November 2009. The increase between November 2009 and February 2010 shown by CMRSS data may well be a seasonal effect.

Head of Household Working Hours

As shown in Figure 6.1, Sakernas data suggest that weekly working hours are generally higher in August than in February. The CMRSS data show significant movements between the August 2009, November 2009 and February 2010 quarters. Over May-August 2009, working hours declined when they might have been expected to increase seasonally, so this could be a GEC impact. The following quarter saw an increase when a seasonal decrease would have been more likely, suggesting a recovery. The decline over November 2009 to February 2010 is in line with seasonal movement. However, in the absence of a quarterly seasonal pattern, these explanations are conjecture.



Changes in Head of Household Weekly Working Hours

(Hours change)	Aug09-Nov09 (Quarterly)	Nov09-Feb10 (Quarterly)	Aug09-Feb10 (Semi-annual)
National	0.6	-1.4	-0.3
Rural	1.1	-1.6	-0.3
Urban	0.0	-1.0	-0.3
Non-poor	0.3	-1.0	-0.3
Poor	1.8	-3.0	-0.7
HoH-Male	0.4	-1.4	-0.4
HoH-Female	2.4	-1.7	0.5

Fig. 6.1: Head of household weekly working hours

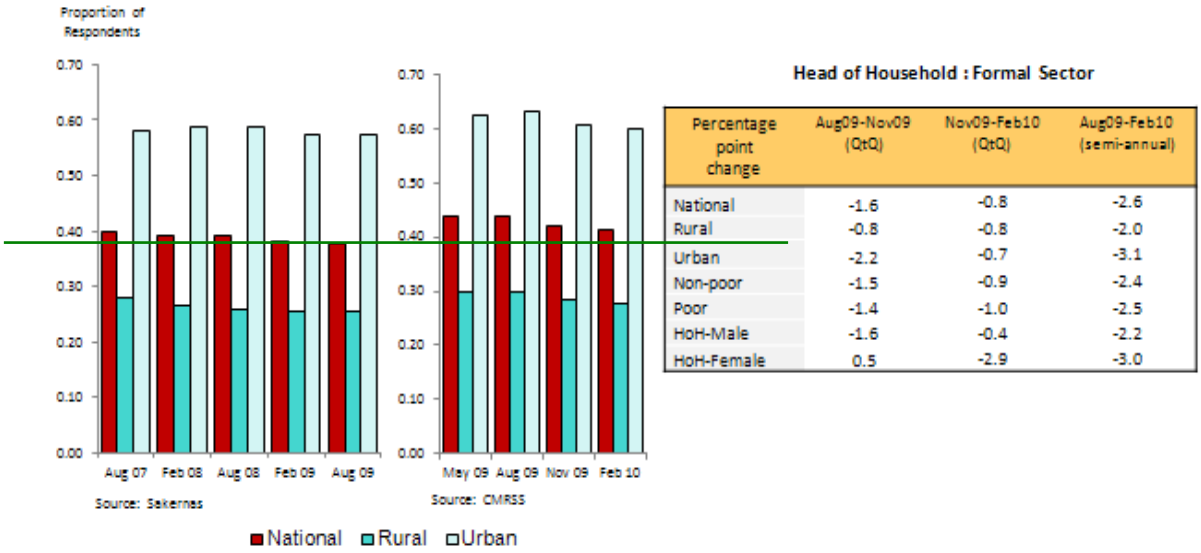
Head of Household Wages/Income in the Formal Sector

According to Sakernas, wages in the formal sector remained relatively stable. The February 2009 data, at the height of the crisis, actually indicate an increase in formal wages rather than a stagnation or decrease, especially for the urban areas.

The CMRSS data for the period May 2009 to February 2010 also show a stable to increasing trend, except for households with a female household.

Head of Household Formal/Informal Sector Changes

The data in Figure 6.2 show a slight but significant decline in proportion of heads of households working in the formal sector. This seems to correspond to the longer term trend, where formal sector employment generation does not keep pace with work force growth, and new employment generation occurs in the informal sector.



Head of Household : Formal Sector

Percentage point change	Aug09-Nov09 (QtQ)	Nov09-Feb10 (QtQ)	Aug09-Feb10 (semi-annual)
National	-1.6	-0.8	-2.6
Rural	-0.8	-0.8	-2.0
Urban	-2.2	-0.7	-3.1
Non-poor	-1.5	-0.9	-2.4
Poor	-1.4	-1.0	-2.5
HoH-Male	-1.6	-0.4	-2.2
HoH-Female	0.5	-2.9	-3.0

Fig. 6.2: Head of household working in the formal sector

Household Income

The first survey round data, providing the May-August 2009 comparison were skewed to the "much lower" end of the scale, indicating that heads of households perceived a loss of household income, especially in rural areas and for poor households. This viewpoint was consistent with the reduction in working hours that was reported over the same period. The second and third round data did not shown any improvements.

Difficulty in Meeting Consumption Needs

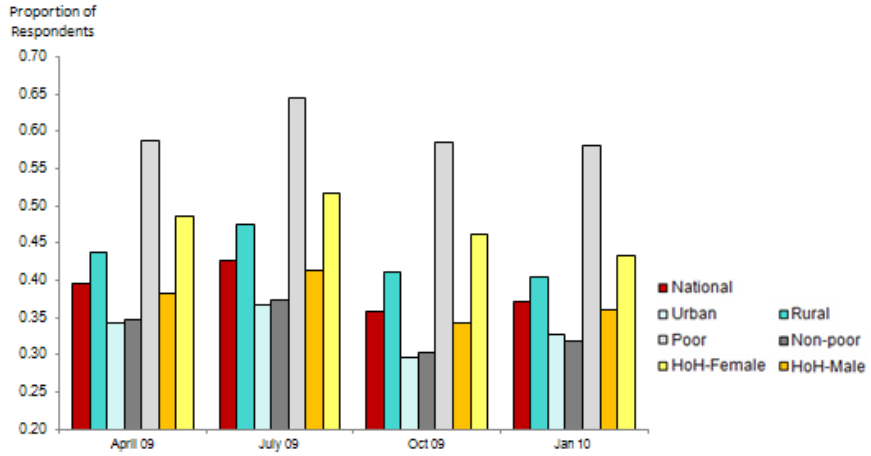


Fig. 6.3: Households having difficulty meeting consumption needs

As indicated in Figure 6.3, the number of households that reported difficulty affording consumption increased from April to July 2009. This was consistent with an increase in food prices and fall in working hours over the same period. The increase disappeared over the July to October period as conditions improved.

Costs for Transport and Food

Reported transportation costs remained largely the same between April and July 2009, but increased over the quarter July to October 2009 especially in rural areas, possibly

corresponding to the Idul Fitri holiday period, followed by a slight decrease over the period October 2009 - January 2010.

Rice volumes remained essentially the same, but the cost of rice increased along with the increase in the price of rice.

Coping by Seeking Employment

There was no evidence of increasing attempts to look for employment either by child worker or female entry into the labour force

Coping by Reducing Consumption Costs

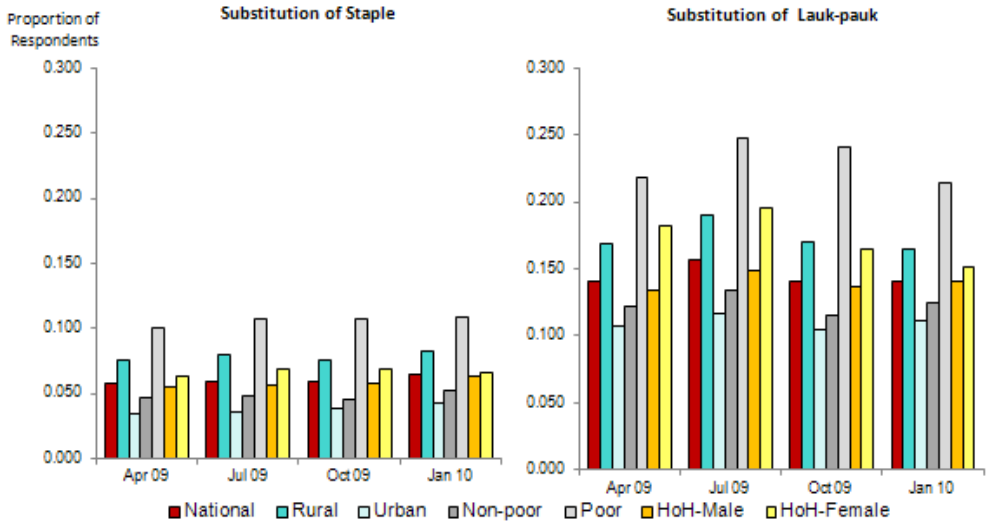


Fig. 6.4: Food substitution by households having difficulty in meeting consumption needs

As illustrated in Figure 6.4, in April/May 2009, just under six percent of the households having difficulty meeting consumption needs were substituting their staple food (generally rice) for one of lower quality or cost, and this was twice as common in rural as in urban households. The situation remained essentially unchanged in the following three quarters. This is quite consistent with unchanged rice volume.

On the other hand, the proportion of households substituting their lauk-pauk (main food accompanying rice, generally a protein such as meat or fish) to one of lower quality or cost increased from 14 percent in April/May 2009 to 16 percent in July/August 2009. This substitution corresponded to falling working hours, increased food prices, and higher difficulty affording daily consumption needs over the same period.

Coping by Financing

The data on financing refer to incidence of the *use* of the various financing mechanisms, not the *value* of the corresponding transactions. Thus the principal coping mechanisms *by value* cannot be determined from the data. Figure 6.5 containing the July/August 2009 indicate the general levels which did not change much over the three rounds.

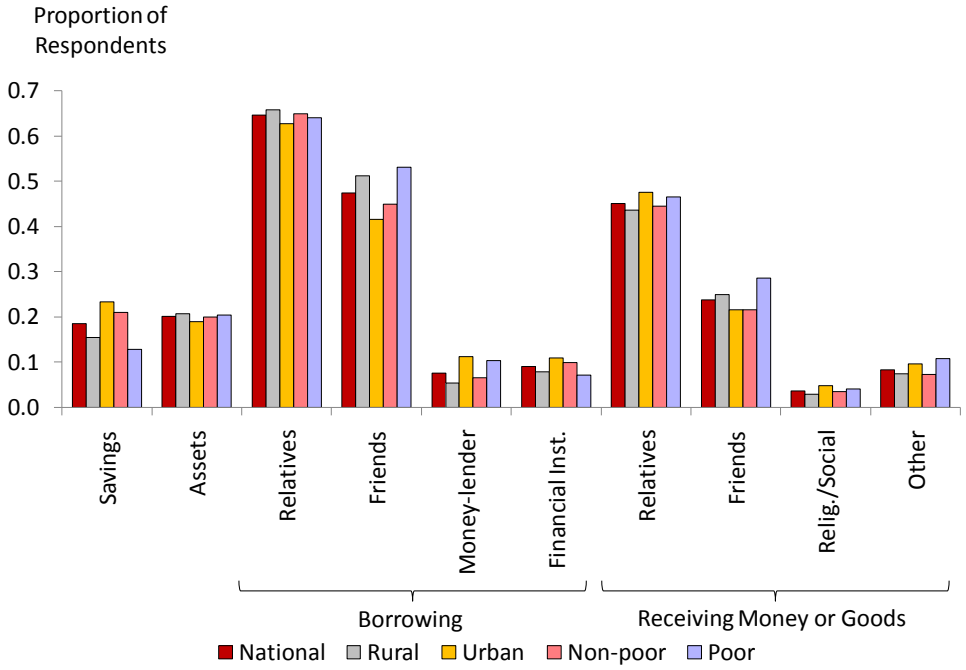


Fig. 6.5: Usage of Financing Mechanisms by Households Expressing Difficulty Meeting Consumption Needs, July 2009

Coping by Migration

In the first survey round, around five percent of households indicated some outward migration over the quarter, more from rural households than urban ones. Around one percent indicated inward migration, roughly the same in rural households as urban ones. Thus, there is no evidence of increasing attempts to look for employment by migration.

6.3 Impact at Provincial Level

Figure 6.6 indicates the results of the provincial analysis for the July-October period in terms of four groups of provinces.

- Group 1: Labour Market good; Household Economics/Coping good or average;
- Group 2: Labour Market average;
- Group 3: Labour Market bad; Household Economics/Coping good or average;
- Group 4: Labour Market bad; Household Economics/Coping bad.

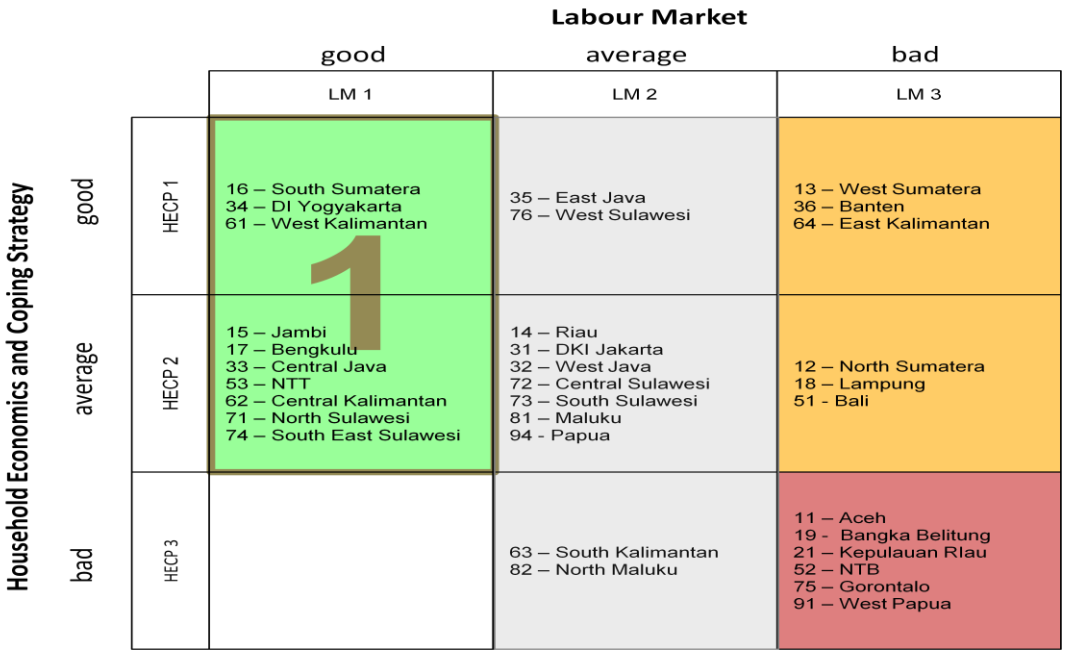


Figure 6.6: Provincial Groupings July-October

6.4 Impact of Crisis at District Level

Following the first round of data, nine districts were identified as being in crisis (red status). 25 additional district were assigned orange in-crisis status. Given the absence of evidence of crisis impacts in subsequent months no further districts were considered in crisis.

7 Dissemination and Use of Results

7.1 Response Identification

During the period of CMRS operation there were three broad categories of possible policy responses to handle districts that appeared to be in crisis:

- application of elements of the program for support of households and individuals – examples are scholarships, free health care, cash transfers;
- application of the program for community improvements;
- application of the program for support of micro-businesses.

However, as the impact of the GEC took place before the CMRSS was introduced very few districts were identified as being in crisis and the range of possible responses and prioritisation of these responses was never fully developed or tested.

7.2 Dissemination

As of the date of this report, CMRS output data have not been broadly disseminated. They will be disseminated using an *information dashboard*. In the first instance at least,

the dashboard will be based on a software platform known as DesInventar and will be jointly owned and administered by Bappenas, the UNDP, and the World Bank.

The system will provide (i) a description of the impact of the GEC on vulnerable households and individuals, (ii) an indication of where, how deeply, and through what channels the GEC manifested itself, and (iii) support for the formulation of appropriate policy responses in a targeted and effective manner. The system will enable, dynamic access to *baseline profiles* comprising various types of socio-economic data for crisis vulnerability analysis, a spatial/national vulnerability index, and access to multiple crisis vulnerability studies/reports.

8 CMRS Evaluation

8.1 Evaluation of Processes

Questionnaire

There were several of ways in which the questionnaire could have been improved.

- Data from relevant parts of the Sakernas questionnaire were transcribed from the Sakernas to the CMRS questionnaire by the interviewer. This approach carried a risk of transcription errors. A more reliable approach would have been to photocopy the relevant parts.
- Response categories for questions asking for current value by comparison with previous value were typically of the form *much higher, higher, somewhat higher, somewhat lower, lower, much lower*. It would have been preferable to have included a neutral response category, for example *much higher, higher, about the same, lower, much lower*.
- The question sequencing was somewhat erratic.

Pilot Test

Conducting a small scale pilot test in two districts - preferably in an urban district and a rural district - would have highlighted some problems before production. The aim would have been to check respondents' understanding of the questions and readiness to respond, and time taken to obtain all the data required. The usual three person BPS interviewer team would have been replaced by a BPS interviewer, a WB representative, and a Bappenas representative.

Data Collection Capture and Processing

There was not time to create comprehensive terms of reference (TOR) for data collection and capture contractor, i.e., BPS. Some omissions from the TOR included:

- requirement for discussions of the questionnaire by focus groups comprised of experienced interviewers, held in at least one predominantly urban and one predominantly rural district;
- pilot testing of procedures;
- training of interviewers;
- quality assurance of data collection procedures;

- quality control of data capture;
- specification of target response rates.

Editing and Imputation

As time and resources were not sufficient for comprehensive micro-level editing, it would have been good to have *macro-edited* the data. This would have meant identifying anomalous aggregate values and for each one investigating the micro-level data contributing to the aggregate to look for obvious errors. In particular, for each district designated as in crisis, values for indicators that indicated high levels of risk should have been checked at micro-level.

Analysis

Given that the national results in Rounds 2 and 3 indicated no negative widespread effects of the GEC, in fact rather the reverse, it would have been appropriate to look, at least briefly, at districts at the other end of the spectrum, i.e., districts doing well in terms of several indicators. Similar tests could have been used to identify good performance ("green") flag settings as were used for risk ("red") flag settings for each indicator, the difference being that the districts thus identified had large positive changes rather than large negative (adverse) ones.

8.2 Quality Considerations

The various sources of error are described in the following paragraphs.

Measurement Errors – Respondents

Errors may have occurred because the respondent did not understand the question, did not know the answer, or did not wish to provide the correct answer. Furthermore, in the case of questions soliciting an opinion, there is no "correct" answer. A respondent may give a different answer if asked the same question on another day or in other circumstances.

In addition, the April data were based on respondent recall from August and cannot be regarded as accurate as if they had been obtained in April.

Measurement Errors - Non-response

A certain effect of non-response on the estimates was to increase their variance. A possible effect was to introduce bias. This occurs if and only if the non-respondents are significantly different from the respondents and its extent depends upon the difference and the non-response rate. As response rates by district were generally very good, for the most part response bias was probably negligible.

Measurement Errors - Interviewers

Errors may have occurred because the interviewer failed to ask the right questions or to record the answers received. In the case of questions involving monetary values in Rupiah a particularly common problem was that interviewers entered data in units instead of thousands.

Processing Errors

Errors occurring during data capture are typically random and can be expected to balance out to a large extent. However, as estimates of change were based on changes in relatively small numbers of households it processing errors may have disproportionally large effects.

Sampling Errors

Sampling errors occurred because data were collected from a sample rather than from the whole population. Conceptually they may be divided into two types.

- *Bias*, which can occur because the estimation formulae systematically produce a biased estimate, for example if there are problems with sampling weights due to poor or out of date population estimates.
- *Sampling variance*, which reflects the variation that can occur in selecting the sample.

As noted in the previous subsection, because the sample is stretched over all districts equally, using a two stage cluster design, standard errors were quite large.

8.3 Summary of Weaknesses and Strengths

Principal Weaknesses

The small sample size of 30 households per district produced district estimates with large standard errors and necessitated resort to at risk and in crisis flags. Interpretation of results required great care as the small sample sizes increased the likelihood that random changes (*noise*) could give wrong signals regarding the districts at risk.

Data from the Puskesmas and from the District Health Offices were highly unreliable.

There was little baseline data. This made it difficult to distinguish between crisis impacts, seasonal effects and adverse changes due to other, non-crisis related factors.

Results took longer to produce than expected.

A fully definitive identification of at risk districts was not achieved due to the limited impact of the crisis during the measurement period

Only one policy response was based on the data collected.

Principal Strengths

The survey covered all districts in the whole country.

The CMRSS was attached to a well established survey and thus the enumerators and supervisors were already familiar with the data collection and data entry procedures. This is likely to have resulted in better quality survey data than could have been expected from new interviewers.

The CMRSS collected a relatively small number of indicators. The workload for data entry and analysis was therefore manageable by small teams.

9 Future Crisis Monitoring and Response System

Whilst not all CMRS expectations were met there is a general consensus among the key stakeholders that the approach showed promise and there is an interest in developing and implementing a crisis monitoring and response system. One of the concluding activities of the CMRS Project was the production of a comprehensive paper that deals with this very topic. It is entitled *Preparing for the Next Crisis:Establishing a Vulnerability and Shock Monitoring and Response System in Indonesia (VSMRS).* It proposes that a system be developed that monitors vulnerability on an ongoing basis and that can be ramped up to monitor the effects of a crisis when one occurs.

In designing an ongoing crisis monitoring and response system the key questions to be to be addressed are: what are the scope and objectives of the system? for what clients is the system intended? to what uses will the clients put the system?

Scope and Objectives

Evidence of a crisis will usually be manifestly obvious from other sources. Thus the scope of the system will be a crisis confirmation and monitoring rather than a crisis detection. The objectives of the system are likely to be:

1. to produce relevant, reliable, timely, accessible, understandable and coherent data to enable monitoring of how a crisis is unfolding, how it is affecting Indonesian society, especially vulnerable groups, what the impacts on affected households are, and the broader socio-economic outcomes;
2. to make such information broadly available to government agencies and other stakeholders to support decision-making on how to design and target policy responses to the crisis;
3. to put rapid and effective response mechanisms in place, to address crisis impacts; and
4. to monitor and evaluate the effectiveness of such mechanisms.

Clients

The main user of the information produced by the system would almost certainly be Bappenas. Other potential users might be:

- other central agencies monitoring poverty, such as the National Team for Acceleration of Poverty Reduction (TNP2K);
- other ministries that have funds designated for crisis response and that seek information on locations where such support would be most effective;
- provincial and district governments who need to plan crisis response activities funded by various organizations;
- donor agencies and NGOs searching for information in support of their activities.

Previous Crisis Monitoring Experiences

In designing a crisis monitoring a response system it is vital to take into account previous experiences. In addition to the recent GEC, Indonesia has experienced several large scale crises over the last 15 years that have affected parts, or the whole, of the country.

- The Asian Financial Crisis started in 1997 and its effects lasted until around 2000.
- The tsunami of 26 December 2004 hit Aceh and North Sumatra causing the death of 132,000 people with a further 37,000 people missing.
- In 2008, large increases food and fuel price increases had an impact throughout the country.
- Other natural disasters, primarily earthquakes, had severe impacts on specific regions, for example Yogyakarta, and Padang.

The monitoring and response systems that were developed as these crises were unfolding, or in their aftermath, provide some insights into the design of a monitoring system for the future. Examples that should be thoroughly analysed include the following:

- 100 Village Survey (Survei Seratus Desa) was a collaborative effort between BPS and UNICEF that was first conducted in May 1994 and again in May 1997 prior to the Asian financial crisis.
- The Kecamatan Crisis Impact Survey was designed as a quick response survey to obtain country wide, up-to-date information on the impact of the financial crisis in 1998.
- The Nutrition and Health Surveillance System (NSS) was established by the international NGO Helen Keller International (HKI) in collaboration with the Ministry of Health in 1995 to evaluate a program in Central Java that promoted vitamin A-rich foods. When the economic crisis hit Indonesia in 1997, the NSS was quickly restarted and expanded to monitor the impact of the crisis on nutrition.

System Design Considerations

An effective, evidence-based, decision-making monitoring and response system is one in which:

- the *demand* for comprehensive, reliable and timely data on how a crisis affects vulnerable groups and individuals is met through a well organized *data collection process*;
- the data are thoroughly *analyzed*;
- *relevant information becomes available* and is *disseminated* to decision-makers in formats that are easy to comprehend; thereby supporting
- the *provision of adequate and timely responses* for impact alleviation where they are most needed.

Determining Data Demand

The information needed in response to any crisis that could conceivably occur is very diverse. So what data should be collected in pre-crisis mode or order to anticipate the data needs associated with the next crisis? There is a risk that, in the search for completeness of coverage, the system becomes too complex and costly to operate. This suggests that, in the absence of a crisis, the system should collect and analyse just sufficient data to detect the onset of a crisis, but should be capable of being quickly expanded in scope should a crisis occur.

Data Supply and Relationships to Other Systems

The system should integrate data from other systems and sources that can help in crisis monitoring.

- Two very obvious potential sources of data are Sakernas and Susenas, especially in view of the impending redesign of both surveys to produce data on a quarterly basis for a representative sample of households each quarter.
- The information systems of the social safety net programs are potential sources of information.
- Signals of a crisis as its effects develop, or during the recovery period will come from regular macroeconomic data sources, such as trade and price indicators, also media reports on items such as the fall or increase in orders from abroad, factory closures, etc.
- The system should be coordinated if not integrated with other monitoring systems, for example disaster monitoring, food and nutrition security monitoring, MDG achievement monitoring.

Only those data items not available from any other source, or not available in a sufficiently timely fashion should be collected specifically by the system.

The paper *Vulnerability and Shock Monitoring and Response System (VSMRS),* specifically proposes that a single system simultaneously monitors vulnerability and crisis impacts.

Implications of Sakernas and Susenas Redesign for Crisis Monitoring

From 2011, the full range of Susenas and Sakernas data items will be available for sample of about 75,000 households on a quarterly basis. These will serve most of the crisis monitoring needs. Additional data regarded as critical for crisis monitoring can be collected by a supplementary module if and when required, for example in the event of emerging crisis. Thus the ongoing pre-crisis cost of monitoring will be basically that of aggregating and analysing data at district level on a quarterly basis, as this will not be part of normal Susenas or Sakernas production.

Annex I: Abbreviations, Acronyms and Terminology

Adverse movement	As applied to an indicator and district; a movement that is in the direction of a district being more *at risk*, for example, reduction in average hours worked by head of household. (Also referred to as a *negative change*.)
At risk	As applied to a *district*, as evidenced by an adverse movement in an indicator due to the effects of a *crisis*, caused by, for example, a global financial crisis or a tsunami.
AusAID	Australian Government agency responsible for managing Australia's overseas aid program
Bappenas	Badan Perencanaan Pembangunan Nasional - National Development Planning Agency.
Baseline	Same as benchmark.
Benchmark	The value of an indicators obtained from a more reliable source than the CMRSS, for example Sakernas, to which a value obtained from the CMRSS can be compared.
Binary	As applied to an indicator, meaning having two possible values; particular case of a categorical indicator.
BPS	Badan Pusat Statistik – Central Bureau of Statistics.
Categorical	As applied to an indicator, meaning having two or more possible values but not quantitative; aggregation over a population leads to counts and proportions.
Change	As applied to an indicator, a measure of difference over time.
CMRS	Crisis Monitoring and Response System.
CMRSS	Crisis Monitoring and Response System Survey.
Crisis	Effect of shock or more gradually deteriorating situation. Can be caused by a natural event such as disease or earthquake, or be human-related, for example, financial or political turmoil, or conflict. It can develop suddenly, following a shock, or over a longer period as conditions gradually worsen, for example, as result of a prolonged drought.
Data item	Same as indicator.
Dichotomous	(As applied to an indicator) same as binary.
Dinas	District health centre.
District	Kabupaten - in this document the term will also be used to refer to the *kota*, the urban equivalent of a district.
GEC	Global economic crisis beginning in 2008.
GOI	Government of Indonesia.

In-crisis	A district *in crisis* is defined as one adversely affected by the GEC or other crisis, as determined by adverse changes in a number of indicators
Indicator	Characteristic of interest belonging to members of a population of interest.
Level	As applied to an indicator, the value of the indicator for given time reference period or point.
LQAS	Lot quality assurance sampling – procedure for taking small samples from subpopulations of a large population, with the aim of measuring a binary characteristic of interest and deducing from the sample results whether or not the proportion in each subset falls short or meets a specified target. For example: the population could be children within country; the subpopulations the children within each province: the characteristic, vaccination against smallpox: and the target 80%.
Negative change	As applied to an indicator and district; the same as an *adverse movement*.
Population	Group of entities of interest; in CMRSS context, populations of interest are persons, households, census blocks, districts, and provinces.
PPS	Probability proportional to size (sample)
Puskesmas	Pusat Kesehatan Masyarakat - community health centre.
Quantitative	As applied to an indicator, meaning having value set comprising a range of integers or real numbers.
Risk Flag	For an indicator and a district, indicating whether or not district is considered to be at risk based on the value of the indicator. For a district, indicating whether or not the district is considered to be in crisis.
Sakernas	Survei Angkatan Kerja Nasional – national labor force survey conducted by BPS.
Shock	Sudden, unanticipated event, such as current financial crisis or tsunami, that is not considered a part of a business trend or cycle, or seasonal, trading day or random effect.
SMERU	Independent institution for research and public policy.
Susenas	Survei Sosial Ekonomi Nasional - National Socio-Economic Survey conducted by BPS.
Variable	Same as indicator.
VSMRS	Crisis and Vulnerability Monitoring and Response System (possible successor to CMRS)
WB Team	World Bank staff and consultants involved in CMRS development.