REPORT ON STATISTICAL AUDIT

OF

ALL INDIA INDEX OF INDUSTRIAL PRODUCTION

AND

FRAMEWORK FOR FUTURE STATISTICAL AUDITS

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Acknowledgements

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CHAPTER-I

INTRODUCTION

The Task

1.1 The National Statistical Commission (NSC) in India is mandated to exercise **statistical audit** over the statistical activities to ensure quality and integrity of the statistical products. The NSC decided to have a statistical audit conducted on the All India Index of Industrial Production (IIP) compiled by the Central Statistics Office (CSO), as a **test case**, before laying down comprehensive methodology for the purpose. The task was assigned in July 2010 to Dr.N.S.Sastry, former Director General of National Sample Survey Organization (NSSO).

Salient Features of All India IIP (Base: 1993-94)

1.2 The CSO is responsible for the compilation and publication of the All India Index of Industrial Production (IIP). The IIP is a short-term (monthly) indicator that compares the growth in the general level of industrial activity in the economy with reference to a comparable base year. This indicator is of paramount importance to the Government for policy planning and analysis purposes, to the Reserve Bank of India in monetary policy formulation and analysis and it is also being extensively used by various organisations including Industrial Associations, Financial Institutions, Research Institutes and Academicians. All these users place a high value on the overall quality of the IIP.

1.3 The IIP covers economic activities for *Mining and quarrying, Manufacturing* and *Electricity.* The distribution of 538 items covered in the compilation of the IIP (Base: 1993-94) is - 64 for mining, 473 for manufacturing and 1 for electricity; further clubbed into 283 *item groups, namely,* 1 for mining, 281 for manufacturing and 1 for electricity. Criteria followed for selection of items were:

- each item generally accounting for at least Rs.800 million of gross value of output at the item level & Rs.200 million of gross value added at the ultimate digit level of National Industrial Classification (NIC-1987);
- retaining some of the important items of the previous series to improve the representativeness at the 2-digit level of NIC-1987; and
- ensuring regular monthly flow of the data on selected items as the overriding criterion.

The item basket captured about 80% of the output of the manufacturing sector in 1993-94. The NIC-1987 is based on ISIC Rev. 2 (1968).

1.4 The IIP is compiled as simple weighted arithmetic mean of production relatives by using fixed base Laspeyres formula. The IIP is a quantum index, the production of items being expressed in physical terms. However, the unit of reporting in respect of certain items like machinery, machine tools, ship building, etc. is in value terms. The monthly figure of production value in such cases is first deflated by the Wholesale Price Index (WPI) of the corresponding categories, released by the Office of the Economic Adviser, Ministry of Industry. The base year for current IIP is 1993-94. At present there is no fixed periodicity for updating these weights.

1.5 The weights of the mining (10.47), manufacturing (79.36) and electricity (10.17) sectors in the IIP have been allocated on the basis of *gross value added* for 1993-94 as published in the National Accounts Statistics. Further the allocation of weights to the items within the 4-digit (of NIC- 1987) industry groups has been done using *value of output* as available from Annual Survey of Industries (ASI) 1993-94. Recognising the importance of the unorganised sector which has grown significantly in the recent past, for the first time the weighting diagram of the 1993-94 series has taken into account the contribution of unorganised manufacturing sector alongwith the organised manufacturing sector.

1.6 For compiling the IIP, the CSO receives monthly production data from as many as fifteen source agencies. The list of source data agencies is given at Annex.V. In terms of the number of items covered, the largest source is the Department of Industrial Policy and Promotion (DIPP) of the Ministry of Industry, which supplies data on as many as 213 out of 281 groups of items in the manufacturing sector, constituting more than 52 per cent in terms of weight of All-India IIP. The Central Electricity Authority furnishes data on the electricity sector. The index relating to Mining and Quarrying sector is being supplied by the Indian Bureau of Mines (IBM), Nagpur, which is combined with manufacturing and electricity indices compiled by the CSO to arrive at the General Index of Industrial Production.

1.7 The IIP for any reference month is released by CSO within six weeks from the end of that month. In order to achieve this norm for the IIP, all the fifteen source agencies are required to furnish data to the CSO within four to five weeks from the close of month. As all the production units do not furnish data within the stipulated time, the source agencies have to resort to estimation for the non-responding units and thus supply provisional data to the CSO. These provisional data are used for computing the quick index for a

given month, which is released by the CSO in six weeks. On the basis of revised production data received later from the source agencies, this index is revised subsequently in the next month and finally, two months thereafter, along with the quick index.

What is Statistical Audit?

1.8 Statistical Audit is a system for the evaluation of the quality of the statistical production process and the results of different statistics. On the basis of these audits, improvements of the process and the results can be proposed. These audits can be applied to all kinds of statistical processes (surveys, studies, and administrative data). These audits are conducted through interviewing process members and users, as well as analysing relevant documentation. Auditors should have reference documentation to conduct this type of audits. (Reference: Final Report on State of the art concerning the auditing activity in National Statistical Institutes, submitted to Leadership Group on Quality, EUROSTAT, 2003 available at):.**http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/G0-LEG-20030930/DE/G0-LEG-20030930-DE.PDF**

1.9 The purpose of statistical audits is two-fold:(i) to present a quality check of statistical processes and products and (ii) to conceive improvements and advice to support the management concerned. Statistical auditing is not intended to be a form of "policing" in order to find out where things are not going, as they should. On the contrary, it should be perceived as a form of help and advice to achieve improvements. At the same time, if the auditing exercise discovers weaknesses and unprofessional approaches, these will certainly be reported. Performing statistical audits should not be considered an equivalent of financial audits or of an investigation by the Office of the Auditor-General. Statistical audit is mainly an instrument for assisting offices producing statistics in evaluating strong and weak points in the statistics they compile and an aid in formulating proposals for the improvement of the statistical process or the statistical results. To obtain experience with statistical auditing, usually pilots are conducted with the aim to better define the scope of future regular audits and to develop a set of rules, procedures and instruments for statistical audits. The present test case of statistical audit of All India Index of Industrial Production, authorized by the NSC in India, falls into the category of such pilots.

International developments on notion of quality assurance for statistical processes and products

1.10 Quality is a central concern for the production of official statistics. A number of countries (not including India) and international organizations have

developed detailed quality concepts and procedures for quality control. While there is considerable overlap among the various existing quality frameworks, **there is no generic internationally agreed national quality assurance framework that can be used by a national statistical office to describe systematically how it assures quality**, **what its current quality concerns are and how it plans to introduce new quality assurance procedures. Such a generic framework would require a broad consensus regarding the notion of quality and would need to build on the frameworks developed thus far**. At the 2010 (forty-first) session of the UN Statistical Commission, the topic of national quality assurance frameworks was put on the agenda as the programme review. The Statistical Commission had before it the Report of Statistics Canada, which contained a programme review on national quality assurance frameworks (E/CN.3/2010/2). Based on a global consultation process, the report presented a review of current quality concepts, frameworks and tools; advocated the use by national statistical offices of a national quality assurance framework and described its basic elements; put forward three illustrative proposals (one of which is the generic Data Quality Assessment Framework developed by the International Monetary Fund) for a generic template for such a framework which, it suggested, should be accompanied by guidelines to assist national statistical offices in the formulation of their individual frameworks; and outlined a process for developing the generic template and guidelines. The UN Statistical Commission emphasized the importance of the topic and fully supported (a) the development of a quality assurance framework template that would focus on national statistical systems, using existing frameworks to the extent possible, and that would be sufficiently flexible to take national circumstances into consideration and (b) the establishment of an expert group on quality assurance. The United Nations Expert Group on National Quality Assurance Frameworks was constituted in August 2010. The Expert Group aims to complete its work by the end of 2011 and will present its recommendations to the UN Statistical Commission in 2012.Hopefully, India will start thinking the development of its own National Quality Assurance Framework, benefiting from its participation in the deliberations of UN Statistical Commission and the outcome of the efforts of the United Nations Expert Group on National Quality Assurance Frameworks and making use of the mandate of the National Statistical Commission. Such a National Quality Assurance Framework, if and when developed by India, will provide the umbrella to the NSC for conducting statistical audit over the statistical activities to ensure quality and integrity of the statistical products.

The Generic Data Quality Assessment Framework of IMF

1.11 The generic Data Quality Assessment Framework (DQAF), developed by the International Monetary Fund (IMF) Statistical Department in

consultation with national statistical offices, international organizations and data users outside the Fund, provides an integrated and flexible framework in which data quality is assessed using a structure that spans institutional environment, statistical processes, and characteristics of the statistical products. It brings together the best practices and internationally accepted concepts and definitions in statistics and covers multifarious dimensions of data quality, such as integrity, methodological soundness, accuracy and reliability, serviceability and accessibility, as well as the related institutional prerequisites. The generic DQAF available at: **http://dsbb.imf.org/images/pdfs/dqrs_Genframework.pdf** serves as an umbrella for data-specific frameworks, such as those for national accounts statistics, consumer price index, producer price index, government finance statistics, balance of payments statistics and external debt statistics. The DQAF serves as an important tool in the work of IMF on establishing standards for dissemination of economic and financial data by member countries. The objective is to introduce statistical standards and guide the countries to put in place a regular and timely flow of relevant data required for macroeconomic policy formulation and implementation.

Special Data Dissemination Standard (SDDS) of IMF and India's Subscription to SDDS

1.12 The Special Data Dissemination Standard (SDDS) was established by the International Monetary Fund (IMF) in 1996 to guide members who have access to the international financial markets in the dissemination of economic and financial data to the public. Unlike other international financial standards, where compliance by member countries is voluntary, in the case of SDDS, while subscription to the standards is voluntary, observance of the standards is mandatory for the subscribing members. A subscriber country has to submit information about its data and dissemination practices (metadata) to the IMF for presentation on the Dissemination Standards Bulletin Board (DSBB) maintained by it. There are four dimensions of data dissemination under the SDDS. Subscribing nations must disseminate the prescribed categories of data with the specified coverage, periodicity and timeliness. These nations must disseminate an Advance Release Calendar (ARC) for the data and it must release the data to all interested parties simultaneously. The SDDS integrity dimension of data contains four prescribed practices. A subscribing nation must disseminate the terms and conditions under which the official statistics are produced (the terms and conditions under which statistical agencies operate, including statistical laws, charters and code of conduct). It must also provide advance information about revision and advance notice of major changes in methodology. Third, it must provide identification of internal government access to data prior to release. Fourth, it must provide the identification of ministerial commentary on the occasion of statistical releases.

A subscriber is required to disseminate the methodology and sources in the preparation of statistics, component details and reconciliation with related data. For each of these dimensions, several monitorable good practices are prescribed that can be observed or monitored by the user of statistics.

1.13 At present, 64 member countries participate in the SDDS. India is one of the initial subscriber members of the SDDS of the IMF. India subscribed to the SDDS, in December 1996 and started posting its metadata on the DSBB on October 30, 1997. It met the SDDS specifications on 14 December 2001. India disseminates data on various macro parameters including its *Index of Industrial Production* on the National Summary Data Page (NSDP) of DSSB in order to meet the SDDS requirement. The Data Quality Assessment Framework (DQAF) of IMF is used for comprehensive assessment of Countries' data quality and based on such assessment IMF prepares a 'Report on the observance of standards and codes (ROSC)-Data Module' and presents the same on its website. For India, the ROSC-Data Module available on the website of IMF contains data quality assessment by IMF using DQAF in respect of national accounts statistics, consumer price index, wholesale price index, government finance statistics, monetary statistics and balance of payments statistics, but it does **not** include assessment of *index of industrial production.* The metadata for India's IIP in the format prescribed by IMF is placed on the DSSB of IMF (Annex.I).

Assessment of Quality of India's IIP using Generic DQAF of IMF

1.14 The Government of India in consultation with the Reserve Bank of India constituted the Committee on Financial Sector Assessment (CFSA) in September 2006, with a mandate to undertake a comprehensive assessment of the Indian financial sector focusing upon stability and development. Dr. Rakesh Mohan, the then Deputy Governor, Reserve Bank of India chaired the CFSA. Secretary, Economic Affairs, Government of India co-chaired CFSA. To assist the Committee in the process of assessment, the CFSA constituted four Advisory Panels including a Panel on Transparency Standards in August 2007. The Advisory Panel on Transparency Standards has assessed India's adherence to the prescribed disclosure requirements under the SDDS using the SDDS Guide for Subscribers and Users, and Generic DQAF of IMF. Its assessment of the quality of India's Index of Industrial Production, published in the Report of the Panel (2009) and the recommendations of CFSA based on it are placed in Annex.II. These have been taken into consideration in the present report of the statistical audit of India's IIP.

Review of India's IIP by National Statistical Commission (2001)

1.15 The National Statistical Commission set up by the Government of India under the chairmanship of Dr.C.Rangarajan to suggest measures for improvement in the Statistical System in the country, in their Report (2001), reviewed the All-India IIP (Base: 1993-94) compiled by CSO and made a number of recommendations of technical as well as administrative nature for improving the quality of the IIP (Annex.III). These have also been considered in the current statistical audit of India's IIP.

International Experience on Statistical Audits

1.16 It is useful to gain from the international experience in conducting statistical audits. The Handbook on Data Quality Assessment Methods and Tools (Eurostat, 2007) available at: **http://unstats.un.org/unsd/dnss/docs-nqaf/Eurostat-HANDBOOK%20ON%20DATA%20QUALITY%20ASSESSMENT%20 METHODS%20AND%20TOOLS%20%20I.pdf** presents the experiences found at the following National Statistical Offices concerning internal and/ or external statistical audits:

- Statistics Sweden;
- National Statistics Quality reviews – Office for National Statistics, UK (ONS);
- INE-PT (National Statistical Institute Portugal) Internal quality audits;
- Statistics Canada;
- Statistics Netherlands;

Statistics Sweden

1.17 At Statistics Sweden the auditing is first and foremost a supporting activity. Therefore the respective departments are asked which surveys they would like to have audited each year. To further strengthen the support aspect, the work of the audit team is financed through the survey's budget. The premise is that all surveys will go through the process, but they can influence when it will take place. Before the audit takes place the survey team shall complete a self-assessment questionnaire and this, together with all relevant documentation, are used by the audit team to guide their work to the areas of the process where they can be most useful. During the audit active discussions are held with the staff of the survey to clarify what is being done and the reasons for the present approach as well as all experiences the staff has. The auditors then compile a report with their main recommendations and any good examples that have been identified and which they think might be useful elsewhere in the organization.

Office for National Statistics (ONS), United Kingdom (UK)

1.18 At the ONS, UK the programme of quality reviews is an important way of ensuring that National Statistics and other official statistics are fit for purpose and that ONS and other National Statistics Producers are continuing to improve the quality and value of these outputs. The Guidelines for Measuring Statistical Quality (Version 3.1), 2007, ONS available at: **http://unstats.un.org/unsd/dnss/docs-nqaf/UK-Guidelines_Subject.pdf** provides a checklist of quality measures and indicators for use when measuring and reporting on the quality of statistical outputs. The Code of Practice for Official Statistics (Jannuary2009, UK Statistics Authority), available at: **http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html** sets out the key principles and standards which official statisticians are expected to follow and uphold in practice. The Code contains eight principles and, in relation to each, a statement of associated practices. It also contains three more detailed protocols – on user engagement; on the release of statistics; and on the use of administrative data for statistical purposes. The UK Statistics Authority has framed the Code to support the assessment of compliance.

1.19 The UK Statistics Authority's Monitoring and Assessment Team systematically reviews the evidence from producers, users and other stakeholders against the Code of Practice. The Head of Assessment is a member of the Board of the UK Statistics Authority. The post of Head of Assessment is a statutory post under the provisions of the Statistics and Registration Service Act 2007. The Head of Assessment is the Authority's principal adviser on the scrutiny of official statistics. The current Head of Assessment is a career statistician who has worked in a number of government organisations. The published assessment reports provide a considered assessment of the strengths and weaknesses of the statistical activities being assessed, highlighting good practices as well as areas for improvement. The assessment against the Code of Practice will cover all aspects of the work leading to the statistical output/ publication and its dissemination.

1.20 The Statement of Principles and Procedures for Assessment covers:

- the aims of the UK Statistics Authority's assessment function;
- the principles which the Authority will adopt when assessing official statistics; and
- the procedures and methods which the Authority will follow.

1.21 The aim of the Authority's assessment function is to promote and safeguard the quality of official statistics, good practice in relation to official statistics, and the comprehensiveness of official statistics. Official statistics include those designated as National Statistics. The assessment function will further aim (i) to help the producers of official statistics to enhance the quality of the statistical service over a period of time, and (ii) to communicate the extent of compliance with the Code to Parliament and the public.

1.22 Assessments will be conducted in accordance with the following five principles:

- Risk-based - prioritising those areas of statistical activity which are considered to present a risk to the quality and reputation of official statistics.
- Proportionate - taking account of the concerns and priorities of users of statistics.
- Cost-effective - making use of existing documentation where available, and avoiding unnecessary burdens on producers or users of statistics. In the interests of efficiency, the Authority may group together ('bundle') related statistics, or statistics with common features, for the purposes of assessment.
- Transparent - operating in an open manner which inspires confidence in the Authority's work.
- Consistent - applying the same principles and standards in all cases.

1.23 Assessments will:

- take place in accordance with a published programme, although *ad-hoc* assessments may be required from time to time in order to report on matters of public concern;
- take account of correspondence and discussion with the managers responsible for the statistics;
- take account of self-evaluation evidence from the relevant managers; and
- involve an opportunity for users of statistics and other stakeholders to contribute to the assessment, and explicitly consider any such contribution.

1.24 Assessment reports will also:

- be prepared in accordance with the Civil Service core values of integrity, honesty, objectivity and impartiality;
- be completed within a reasonable timescale;

- reflect the views and needs of users of statistics and other external stakeholders, and take account of all the available information, comparing the evidence against published standards and criteria;
- give a brief account of the assessment of compliance against each of the Code's main principles and protocols;
- list proposals and recommendations which promote and support improvement;
- be relevant and accessible - reporting findings and conclusions fairly, clearly, and openly and in a manner which is useful to, and understood by, producers, users and the public;
- present clearly the Monitoring and Assessment Team's conclusions in relation to the degree to which the statistics comply with the Code of Practice; the nature of any improvements needed; and a recommendation to the Authority as to whether the statistics should be, or should continue to be, designated as 'National Statistics';
- be shown to the relevant producer body in draft form prior to publication, in order to ensure factual accuracy;
- be published as soon as possible after completion.

1.25 Self-evaluations will be conducted using a standard template (Annex. IV) on written evidence for assessment about statistical product/ output and producer body's practices as a whole) based on the Code of Practice and this will form the starting point for discussions between the Monitoring and Assessment Team and managers. This information will be supplemented by:

- any previously published reviews of the statistics;
- any other relevant information acquired by the Monitoring and Assessment Team at any time;
- any information submitted by users or stakeholders

1.26 The Statistics Authority's annual reports to the UK Parliament and devolved legislatures will list the assessments conducted in the previous year with their conclusions, as well as those planned for the coming year. As an example, Assessment Report 81,January 2011, on Short-term Economic Output Indicators (produced by the ONS, UK) may be seen at: **http://www.statisticsauthority.gov.uk/assessment/assessment/assessment-reports/index.html**. The report provides an assessment (authorised by UK Statistics Authority) on short-term (monthly) economic output indicators, the Index of Production (IoP) and the Index of Services (IoS). These indices measure monthly changes in the volume of output of the UK production and service industries. The production industries comprise the manufacturing, mining and quarrying, and energy supply industries, which together account for around 17 per cent of output from the UK economy. The

service industries include private sector and government services and account for around 74 per cent of output from the UK economy.

1.27 Summary Quality Report for Index of Production issued by ONS, UK in December2009 is available at: **http://www.statistics.gov.uk/articles/nojournal/SummaryQualityR eportforIndexofProduction.pdf**.

INE-PT (National Statistical Institute Portugal)

1.28 INE-PT started its process of internal auditing in 2000, focused on the statistical process. The reference of these audits is the Statistical Production Procedures Handbook. However, the whole process of internal quality audits was organised taking into account the international standards – ISO Norms (International Organization for Standardization). The aim of these audits is to verify if statisticians are working according to the procedures that are settled in the organisation for this process and to improve the process description as well. Therefore, the audits work as a tool for continuous quality improvement.

1.29 According to the above-mentioned norms, an internal procedure was settled for the Internal Quality Audits process, which comprises the following information for the execution of quality audits:

- Quality audits reference documents,
- Concepts/definitions,
- Quality audits aims,
- Quality audits planning,
- Responsibilities,
- Quality audits phases,
- Auditors selection/recruitment,
- Auditors registration,
- Quality auditors teams, and
- Support documentation: audit plan; non-conformity/observation form; audit report; corrective/prevention action form

Apart from this procedure, documentation to help the auditors do their work was also provided– mainly checklists based on the procedures. The audit is based on observation of evidence and on minimum documentation that every project leader has to organize for its "survey". This minimum documentation is compulsory by means of the Statistical Production Procedures Handbook that establishes a set of common internal procedures for all statistical processes, mainly for statistics based on surveys. The idea behind this handbook is that if we define a process in a way we believe it is best then our product will have quality. This handbook defines compulsory minimum

documentation, and internal procedures among units that somehow are involved in the process.

Statistics Canada – Example of a policy for internal auditing

Internal Audit Policy Definition

1.30 Internal Audit will comprise the systematic, independent review and appraisal of all operations for purposes of advising Statistics Canada's management on the efficiency, effectiveness and economy of management.

Organization and relationships

1.31 The Chief Statistician is the client for Internal Audit in Statistics Canada. The Director of the Internal Audit Division will have direct access to the Chief Statistician when required. The Internal Audit Division will have access to any information necessary for the fulfillment of the audit mandate. The Chief Statistician, with the support of an Internal Audit Committee which he chairs, approves and promulgates audit policy, approves the scope and frequency of audit, reviews audit reports and approves action plans. The Internal Audit Committee will consist of members of the Policy Committee; staff support will be provided by the Internal Audit Division.

1.32 Internal Audit will be coordinated with the function of program evaluation, which focuses on program structure and results rather than on program systems and management controls. The Internal Audit Division will exchange schedules and audit information with the Office of the Auditor General, in order to minimize duplication of effort and disruption of departmental staff, and will establish effective communication with the central agencies, so that they are informed on the level of compliance with central agency directives and guidelines.

Plans and reports

1.33 The Internal Audit Division will develop, maintain and follow:

   (a) A Long-term Audit Plan to provide for coverage of Statistics Canada's operations over the three-to-five year period.
   (b) An Annual Audit Schedule to describe the specific audits to be carried out over a 12-month period.

Both plans will allow for flexibility in the use of resources to take advantage of opportunities as they present themselves and to react to significant changes in the environment within which Statistics Canada functions. An annual report

will be submitted to the Chief Statistician on audit coverage and major findings. The report will include an assessment of the impact of the function upon Statistics Canada and an estimate of benefits realized as against cost incurred.

Process

1.34 The staff of the Internal Audit Division supplemented by individuals or organizations hired under contract by the department will conduct audits. Responsibility for audit assignments will remain with the staff of the Internal Audit Division. Audits will be conducted openly. Audit findings will be disclosed to the auditee on an ongoing basis during the course of the audit. Full discussion of findings and proposed recommendations will be held with all involved levels of management. Auditees will actively participate in the audit process. They will assist in setting audit objectives, provide necessary information, discuss preliminary findings with the audit team and participate in their modification, review and comment upon the draft final report and prepare an action plan in response to agreed-upon recommendations for submission to the Chief Statistician and the Audit Committee.

1.35 Every audit assignment will result in a written report. Final audit reports will incorporate comments and proposed actions of the auditees and will be available as appropriate.

Statistics Netherlands

1.36 Statistical auditing has three purposes:

- to actually find out what is being done about quality management in statistical departments;
- to generate suggestions on how to improve quality management; and
- to find out what the best quality practices are and to incorporate these into the guidelines for quality systems.

1.37 To obtain experience with statistical auditing, two pilots were carried out in 1996. One was about the statistics on Performing Arts, the other about statistics of the Transport industry. Auditors were selected by the Audit secretariat on the basis of their statistical and managerial qualities. The techniques applied during the audits were interviews on the one hand and analysis of documentation on the other. The findings of the audits and the recommendations made on the basis of these findings were laid down in reports.

1.38 A first evaluation of the pilot audits showed the following main points:

- Most auditors had liked the work.
- They were received well in the audited sectors and cooperation of staff and management had been good.
- The training had been enjoyed.
- In one of the two cases, the terms of reference for the audit had not been explicit enough, which had resulted in an incomplete audit.
- Drafting a systematic audit plan for the sector to be audited was important (including questions as: who supplies/reads documentation, who interviews who etc.).
- Auditing takes time; therefore it is not possible to combine it with other tasks during the audit period.
- To remain distant and objective can be difficult, in particular when auditees become emotional and when the auditor is in some way familiar with the audited sector.
- On the part of the auditees, more than 70% were convinced of the usefulness of audits; 90% of them had felt that the atmosphere during audit interviews had been relaxed; 71% felt that the evaluation session had been good; 90% thought that the audit report was well written and clear, but some auditees thought that the conclusions could have been harder; 65% thought that the recommendations of the audit report had been useful. It has also been noted that, in general, most auditees very much like to talk about their work and enjoy sharing experiences and problems with others.

1.39 As one of the results of the pilot audits, the following code of conduct for audits was agreed.

- The main purpose of statistical audits within the Statistics Netherlands is to help identify statistical sectors what the weak and strong points of their statistical processes are and how these may be improved. In a way, audits are like presenting a 'mirror' to the auditees.
- There will be an audit plan, as part of the management contracts between division managers and the Director-General (DG). Each statistical process in a statistical department will be audited once every five years.
- Audits are organised and moderated by an audit secretariat, which is part of the DG staff.
- Teams of three auditors, selected on the basis of specific expertise, carry out ·Audits. A pool of about 25 auditors will be trained and regularly employed. Their performance will regularly be monitored by the audit secretariat.

- The independence and neutrality of the auditors, the audit team, the audit secretariat and the methodology and quality division should be assured.
- Before an audit starts, the procedures and planning will be agreed with the department manager.
- The department manager is responsible for the supply of proper documentation, including a list of employees and their tasks, work instructions, checklists, handbooks, existing guidelines for quality control. He/ she also appoints a contact person from his sector.
- In a workshop, the audit secretariat briefs the audit-team on how the audit will be carried out. Also, the scope of the audit (including any points which deserve special attention) is formulated.
- The audit secretariat organises an introductory meeting, in which the scope and procedures are discussed. After that an interview scheme is drafted (implying, among other things, the final selection of the people to be interviewed). The maximum number of interviews per day is three, by two auditors, because interviews are to be relaxed. Interview reports are only for auditors. However, all reports are given to auditees for correction.
- The audit team drafts first report, which is first discussed with the audit secretariat.
- One audit secretary and the lead auditor discuss the first draft with the department head and contact person.
- The audit report is subsequently discussed in a meeting with department head and auditees.
- The final audit report is then written and sent to the department manager. A copy is sent to the Director-General..
- The department manager has three months to react and to draft a plan for improvements on the basis of the recommendations.
- One year after the audit has taken place a questionnaire is sent to the department manager in order to check what has been done with the recommendations.
- After every five audits, the Audit Secretariat writes a summary report about important results, which may be beneficial for other departments as well. This report is discussed by the Management Committee for Auditing and Quality Care and is also widely circulated.

CHAPTER-II

STATISTICAL AUDIT OF
INDIA'S INDEX OF INDUSTRIAL PRODUCTION

The Audit Process

2.1 The Deputy Director General (DDG) in the Secretariat of National Statistical Commission (NSC) in India contacted Dr.N.S.Sastry, Former Director General of NSSO and proposed that the NSC would like to assign him the task of 'statistical audit' of All India IIP as a 'test case', if he is available and willing to take up the work. Later, the Chairman of NSC had a telephonic talk with Dr.Sastry stressing the importance of the task in the light of the felt concerns of users of IIP about its quality and also the need to treat this first exercise of statistical audit as a 'test case' to lay down the procedures for future statistical audits of important statistical processes and products. The Draft Order indicating the terms of reference and the provision that the work may be undertaken intermittently over a period of time was shown to Dr.Sastry before the Order (Annex. IX) was issued. The tenure for audit which was initially given for three months w.e.f 1st August 2010 has been extended up to the end of May 2011.

2.2 A meeting was arranged with Chairman, NSC, wherein the Auditor, Additional Director General (Economic Statistics Division), CSO responsible for production and release of the monthly IIP, and the DDG (NSC) participated, to work on the outline of the statistical audit process. In this meeting, CSO shared with the Auditor the main reference document "An Overview of Revision of Base Year of All India Index of Industrial Production" and proposed that the audit exercise may start with a meeting at the CSO among the Auditor and the concerned officers of the CSO and the Source Agencies (List at Annex. V) supplying the monthly production data to the CSO for the compilation of the IIP.

2.3 The meeting with the CSO and Source Data Agencies was held under the chairmanship of the Chief Statistician of India (CSI) and Secretary of Ministry of Statistics & Programme Implementation (MOSPI) on 25 August 2010.Ten out of fifteen source agencies supplying major portion of monthly data to CSO for the compilation of IIP were represented in this meeting. The officers of the CSO and the ten source agencies briefly presented salient points of their work and problems of non-response faced in respect of units providing the monthly data and the solutions adopted for those problems. The CSI pointed out that the statistical audit is being done for the first time in India and requested the Auditor to evolve the methodology of statistical audit

in general, which could be adopted for the statistical products. In his view, over time the statistical products may become less robust compared to the initial years due to change in the scenario which does not get adequately reflected in the statistical product. The CSI suggested that the Auditor should also have a meeting with principal stakeholders and data users of IIP to have a perspective of their concerns. The Auditor emphasized that the statistical audit should not be taken as a faultfinding exercise. It is basically to help the data suppliers, the CSO and the data users. He pointed out that the audit would also highlight the good features of the work being done, in addition to the opportunities found for improvement.

2.4 The Auditor requested the CSO and the source data agencies to provide a detailed write up on the regular process that is undertaken in respect of planning, data collection and processing, and compilation and dissemination of IIP, covering a list of indicative items (Annex. VI). Replies on this list of items were received from the CSO and 13 source data agencies responsible for most of the data used in the compilation of IIP and these have been considered in the audit exercise of IIP.

2.5 A meeting with the major users of IIP was held at the CSO on 2 December 2010 under the chairmanship of the CSI and Secretary (MOSPI). The representatives of 14 official and non-official user agencies, including the Ministry of Finance, Reserve Bank of India (RBI), Ministry of Mines, Directorate General of Foreign Trade, National Accounts Division of CSO, Institute of Economic Growth, National Council of Applied Economic Research, Confederation of Indian Industry (CII), Federation of Indian Chambers of Commerce & Industry (FICCI), PHD Chamber of Commerce & Industry (PHDCCI), CRISIL, ICRA Ltd, CITI Group, and YES Bank Ltd attended the meeting. The CSI apprised the meeting that the NSC is to evolve the methodology and standards for conducting statistical audit of statistical products to ensure their quality and integrity and in that context, the present statistical audit of IIP is a 'test case'. For this purpose, it was felt that an interface with users of IIP would be vital to gain a perspective of their concerns. The Auditor stressed that an important objective of the statistical audit is to bring qualitative improvement in the audited statistical product, taking into account the quality concerns of the users of the statistical product and, therefore, he would like to be benefited by the users' perspective. There is a consensus among the users that the IIP is an essential and important short-term indicator of the change in the industrial economy of the country. Prof. B. Goldar of the Institute of Economic Growth, who is presently the Chairman of the Standing Committee on Industrial Statistics (SCIS) of the MOSPI, stated that the main use of IIP is to study the current economic scenario and the problem of volatility of current series of IIP is due to continuance of 1993-94 base and to get a real picture in the longer period

Annul Survey of Industry (ASI) results are more accurate than IIP. The Economic Adviser of FICCI felt that, at times, IIP gives a picture that is not in accordance with the ground level feedback gathered from Quarterly Business Confidence Survey. He illustrated it with the examples of behaviour of IIP in respect of Consumer Durables and Capital Goods sectors in certain periods. The Director, Structural Issues Division, RBI said that the seasonally adjusted IIP may also be released by the official agency (CSO) (this view was supported by the Chief Economist, CITI Group and the Senior Economist, PHDCCI), and also suggested to highlight the items responsible for the volatility of the IIP in the Press Note on IIP itself to increase the credibility of the index (this view was also held by the Chief Economist of CITI Group). It was decided at the meeting that the CSO would place the Press Note on IIP on the Ministry's website at sharp 11.00 hrs on the due date (12th of each month) of release and indicate in the Press Note the main items responsible for the increase/ decrease in the growth of the IIP. The issue of compilation of seasonally adjusted IIP would be sent for consideration of the SCIS of the MOSPI.

2.6 Following the two meetings with the CSO, source data agencies and the users and study of the written material received from the CSO and source data agencies, the Auditor and the DDG (NSC) visited the concerned divisions of the CSO and the major source data agencies, namely, the DIPP, the Textile Commissioner's Office and the Indian Bureau of Mines to interview the officials engaged on IIP work and to understand the working procedures and look into the records maintained and used in day- to- day work. During the discussions held in these visits, additional documentation and data records were identified and copies of these were also supplied by these agencies to the Auditor for study and use in the audit exercise.

2.7 All the documents received in connection with the work of the statistical audit of the All India IIP (Base: 1993-94) have been furnished separately to the NSC Secretariat.

Main Audit Reference Documents

2.8 Statistical audits are conducted making use of audit reference documents related to concerned statistical processes and/or products. In the present case of auditing 'All India Index of Industrial Production', three main reference documents are used. These are:

- An Overview of Revision of Base Year of All India Index of Industrial Production, furnished by Central Statistics Office, India, and available at: **http://mospi.nic.in/Mospi_New/upload/iip_overview.htm**

- International Recommendations for the Index of Industrial Production 2010, prepared by United Nations Statistics Division, and available at: **http://unstats.un.org/unsd/statcom/doc10/BG-IndustrialStats.pdf**

- Manual on Index of Industrial Production (IIP), furnished by the CSO, India and available at:

http://mospi.nic.in/Mospi_New/upload/manual_iip_23oct08.pdf

2.9 The first document contains information on India's index of industrial production: origin & history, exercise on revision of base year to 1993-94, salient features of the revised series (Base: 1993-94), problems in the quality of IIP with base 1993-94, suggestions for improvement in the quality of IIP (Base: 1993-94), one time revision of indices of industrial production, recommendations of National Statistical Commission (chaired by Dr.C.Rangarajan) for improvement in the IIP, and exercise for revision of base year from 1993-94 to 1998-99 (revision not done).

2.10 The second document is a revision of the original *Index Numbers of Industrial Production* manual published by the United Nations in 1950. It takes into account methodological developments in the field of index number calculation that emerged over the past decades and describes new recommended methodological standards for the compilation of index numbers of industrial production. The development of these standards has taken into account other recently revised statistical standards and recommendations and contributes to a coherent set of international guidelines that include the *System of National Accounts 2008*, the *International Standard Industrial Classification of All Economic Activities (ISIC) Rev.4*, the *Central Product Classification (CPC) Ver.2*, the *International Recommendations for Industrial Statistics (IRIS) 2008*, the *Producer Price Index (PPI) manual* and the *Consumer Price Index (CPI) manual*. In addition to outlining the standard methodology, this publication also provides practical guidance for actual steps in the index number calculation and presents recommended methods for each industry in its scope to assist countries in producing high-quality short-term economic indicators that are also internationally comparable.

2.11 The third document on India's IIP adopted the broad framework of the International Manual on IIP, 2010. Most of the materials included in the Manual have been adopted from the different international publications on IIP, Index of Service Production (ISP) and other compilations on statistical methodology. The purpose of this manual is to provide the statistical offices both at the national and state levels with guidelines in the compilation of IIP. The other purpose is to provide the users of IIP with a ready-to-use reference

guide on methodological aspects of data (metadata) on IIP. The contents of the Manual include: object and uses of the index, historical background, fundamental concepts, sources and methods, index compilation, presentation and dissemination as also a short discussion on overall quality assessment framework of the index.

2.12 The topic-wise summary list of recommendations presented in the publication: International Recommendations for the Index of Industrial Production 2010 is given in Annex.VII. This list has been used as an overall framework for examining the features of India's IIP (Base: 1993-94) and identifying opportunities for improvement, as part of the statistical audit exercise. This approach was chosen as it enables a detailed discussion of each of the aspects of the following framework for assessing the quality of the IIP.

Framework for Assessing the Quality of IIP

2.13 The International Recommendations for Index of Industrial Production 2010 (IRIIP2010) advocate the use of following OECD Quality Framework to serve as a basis for discussing ways to assess, maintain and improve the overall quality of an IIP. The overall quality assessment of the IIP includes issues relating to data variables as well as index compilation and dissemination. In general, quality is defined as "fitness for use" or "fitness for purpose" in terms of user needs. This definition uses a multi-dimensional framework to assess quality rather than, say accuracy, which has traditionally been the measure of quality. Even if data are accurate, they cannot be said to be of good quality if they are produced too late to be useful or cannot be easily accessed or appear to conflict with other data. Alternatively, a variable to produce the IIP that is regarded as conceptually preferred may not be sufficiently timely or it may not be sufficiently accurate. In this case it would be desirable to use another variable that scores more highly against the overall evaluation of suitability for use in compiling a monthly IIP. The quality of a statistical product is assessed via the following seven dimensions, as detailed below.

(i) Relevance

2.14 Statistics are compiled to meet the strong demands of analysts and policy makers. Relevance depends upon both the coverage of the required topics and the use of appropriate concepts. The purpose of IIP is to measure short-term change in value added; an indicator should be designed to do that; rather than, for instance, being designed to measure the level of the indicator at a point in time. That is, the indicator should measure changes in output (value added) rather than some other variable or concept. Relevance is proportional to the number of sub-sectors covered in the index. Variables

are classified as "preferred" (representing best practice), "alternative", and "other" in order to produce an IIP by industry. The *preferred approach* presents the variables and methods that are considered to be most appropriate as a short-term indicator in an IIP context. If this preferred variable is not available, the use of *alternative variables* should be considered. The *other variables* typically produce a less precise measure and should be used to compile a monthly IIP only until a preferred (or even an "alternative") variable becomes available. It is acknowledged that 'other' variables could produce acceptable results, depending on the country and activity context. Relevance is also positively correlated to the number of "preferred" methods adopted in comparison to the number of alternative or other methods.

(ii) Accuracy

2.15 Accuracy refers to the closeness between the values provided and the (unknown) true values. Accuracy has many attributes, and in practical terms there is no single aggregate or overall measure of it. The level of accuracy of the indicator itself should be acceptable. Accuracy can be assessed in terms of the degree to which the data correctly estimate or describe the quantities or characteristics they are designed to measure. The framework then advises assessment of accuracy via "the closeness between the initially released value(s) and the subsequent value(s) of estimates" in practice. It, however, also notes that "the absence of revisions does not necessarily mean that the data are accurate". According to the Eurostat's *Methodology of Short-term Business Statistics: Interpretation and Guidelines*, "Accuracy can be measured using several indicators: random sampling errors, non-random sampling errors, statistical frame errors, measuring errors, process errors, non-response errors, model errors".

(iii) Credibility

2.16 The credibility of data products refers to the confidence that users place in those products based simply on their image of the data producer, i.e., the brand image.

(iv) Timeliness

2.17 Data should be made available quickly after the reference period. As the purpose in IIP is to estimate short-term change in value added, a short-term indicator is required to be made available quickly, say, within a month or two from the end of the period to which they relate. Timeliness also includes the concept of periodicity/ frequency. That is, in order to reflect monthly (or quarterly) value added, an indicator should ideally consist of independent

monthly (or quarterly) observations. (e.g. release of IIP data approximately 45 days after the end of the reference period for monthly indices).

(v) Accessibility

2.18 The accessibility of data products is described as how readily the data can be located, the suitability of the form in which the data are available, the media of dissemination, and the availability of metadata and user support services. It also includes the affordability of the data to users in relation to its value to them and whether the user has reasonable opportunity to know that the data are available and how to access them. In addition, the Eurostat's *Methodology of Short-term Business Statistics: Interpretation and Guidelines* states that there is a "need for a catalogue system to allow users to find what information is available, and where to find it" and that "the SDDS therefore requires advance dissemination of release calendars and simultaneous release to all interested parties".

(vi) Interpretability

2.19 The interpretability of data is closely related to the users' understanding of the data for their use. Thus the degree of interpretability depends on all aspects of information on the data such as adequacy of the definitions of concepts, target populations, variables and terminology, limitations of the data, etc. The concept of interest here is coverage. An indicator that estimates short-term change in value-added should cover, in some representative fashion, the full range of businesses or other types of organizations or activity that are included within the industry or sector category in question. Also the quality of metadata provided along with the IIP is indeed crucial to improve interpretability. Such metadata should, in particular, inform the user on how close to the target variable (*i.e.* the change in value added) the input variables used in the IIP are. When there is a significant difference, it should be explained to what extent this may cause a bias in the measure of the industrial production for particular economic activities or the index as a whole.

(vii) Coherence

2.20 The coherence of data products reflects the degree to which they are logically connected and mutually consistent. Four important sub-dimensions for coherence can be distinguished:

- coherence within a dataset;
- coherence across datasets;

– coherence over time; and
– coherence across countries.

The IIP can be *coherent within a dataset* if all individual sub-indices that are components of an overall IIP are compiled based on coherent methodologies. C*oherence across datasets* for the IIP cannot be ensured until its coherence with corresponding datasets is properly checked. As the IIP and GDP are often alternatively used in assessing the performance of the industrial sector of the economy, coherence between these two will have to be examined by ensuring consistency in classifications, concepts and definitions. Comparability between the IIP and GDP is also an important consideration. To ensure coherence over time and across countries, the same indicator should be used throughout the entire time series. If there are definitional changes, adjustments should be applied to ensure consistency and to enable comparison over time and between countries.

2.21 The **cost to produce** necessary statistics is an additional criterion to assess quality in regard to short-term statistics. Cost efficiency can be described as a measure of the costs and provider burden relative to the output. Provider burden is a cost that happens to be born by the provider, but is a cost nevertheless.

2.22 The difficulty with any quality framework is its implementation. Some scoring system that allows a practical measure for comparison purposes is sometimes used while others rely heavily on qualitative statements to highlight priority areas for data improvement.

2.23 In the IRIIP2010, it is recommended that a quality review of the IIP using a quality assessment framework be undertaken every four or five years, or more frequently if significant new data sources become available.

Assessment of the Salient Features of All India IIP (Base: 1993-94) against the International Recommendations for IIP 2010

Scope

2.24 The All India IIP (1993-94) covers economic activities for *Mining and quarrying*; *Manufacturing* and *Electricity* sectors. The International Recommendations for Industrial Statistics (IRIS) 2008 define the scope of industrial production as International Standard Industrial Classification (ISIC) Rev.4 sections: B (Mining and quarrying), C (Manufacturing), D (Electricity, gas, steam and air conditioning supply), and E (Water supply, sewerage, waste management and remediation activities). To be consistent with this definition of the scope of industrial production, the International Recommendations for IIP 2010 specifies that the IIP be compiled for activities

in ISIC Rev. 4 Sections B, C, D and E, i.e. Mining and quarrying, Manufacturing, Electricity, gas, steam and air-conditioning supply, as well as Water supply, sewerage, waste management and remediation activities. This reflects a change from the original 1950 international recommendation on IIP scope, which included Mining and quarrying, Manufacturing and Electricity and gas. **It is recommended that the scope of the All India IIP (Base 1993-94) may be enlarged to cover additional economic activities for "gas, steam and air-conditioning supply; Water supply, sewerage, waste management and remediation activities" in case these economic activities are significant contributors to value addition in the Indian economy.**

Industrial Classification

2.25 The All India IIP (Base 1993-94) follows the National Industrial Classification 1987 (NIC-1987) that is based on ISIC – Rev 2 .The NIC-1987 is an outdated industrial classification. The Annual Survey of Industries (ASI) that provides 'value added' estimates in manufacturing for India's National Accounts Statistics uses NIC-2008 since 2008-09 ASI. The structure of NIC-2008 is identical to the structure of ISIC Rev. 4 up to 4-digit level 'class'. Classes were then divided into 5-digit 'sub classes' according to national requirements. The International Recommendations for IIP 2010 states that ISIC Rev.4 is the most suitable classification for the purpose of IIP. **As the All India IIP should use an industrial classification compatible with the one used in ASI, NIC-2008 based on ISIC Rev.4 is the suitable classification for All India IIP.**

Sources of Data

2.26 The two primary sources of data to compile the movements in an IIP are surveys and statistics derived as byproduct of administration. According to the information recently collected by the UN Statistics Division from 69 countries, most countries (about 80%) construct their IIP using only survey data, while approximately 20% of countries use administrative data to compile **all or part** of IIP. The majority of countries currently compile their IIP with statistical surveys as the data source. The required information to compile an IIP can be collected by the statistical office directly from the units concerned or obtained from secondary sources. When the statistical office directly collects data from units, the sample survey technique is a less costly way of data collection for compiling accurate industrial statistics at high frequency. Countries currently implement various approaches to sample surveys. These include only surveying those businesses above a size threshold (e.g. employment or contribution to production); a simple random sample drawn from the whole population; or a stratified sample. In the

International Recommendations for IIP 2010, a stratified sample survey approach is recommended with complete enumeration above a threshold (i.e. 100% coverage of the most influential businesses) and samples of businesses below the threshold (i.e. partial coverage of less influential businesses) to collect data for the compilation of IIP.

2.27 While assessing the overall quality of All India IIP (Base: 1993-94), the Committee on Financial Sector Assessment (CFSA) in its Report (March 2009) noted that, for compilation of the IIP, the CSO uses the data supplied by a multitude of sources, the largest source being the Department of Industrial Policy and Promotion (DIPP), which accounts for over half of the items included in the index and more than half of the weight. With liberalisation (de-licensing in particular), the institutional data collection machinery has suffered. For example, since the removal of the industrial licensing regime in the early 1990s, there is no longer any compulsion for firms to submit comprehensive data on a range of indicators essential to industrial statistics. The data submission is largely voluntary and, in the process, has weakened considerably. The CFSA recommended that:

- The CSO should assume direct responsibility in generating the IIP.
- It should create the frame, select the sample and collect the data directly from the units.
- Its reliance on the administrative machinery and on industry associations should be reduced.

It is noteworthy that the above recommendations of the CFSA for All India IIP are in accordance with the International Recommendations for IIP 2010 in respect of the **sources of data for the compilation of the IIP**.

2.28 The National Statistical Commission chaired by Dr.C.Rangarajan in its Report (2001) commented on the deficiencies of All India IIP (Base 1993-94) (Annex. III) drawing particular attention to **inadequate representation of manufacturing sector in** the currently compiled index due to the failure of the source data agencies to supply regular monthly production data on a significant number of items originally selected for inclusion in the provisional item basket of the index. The item basket for the All-India IIP with base 1993-94 was selected using detailed results of ASI, 1993-94. The provisional item basket of the 1993-94 base series contained 644 items. But, some of the source agencies including the Department of Industrial Policy & Promotion, the major source agency of data for IIP, could not furnish monthly time series production data on large number of items, which had to be dropped. Although, some important items of the earlier series with base 1980-81 were added in the item basket on account of ready availability of data, dropping of important new items from the item basket adversely

affected the representative character of the item basket for 1993-94 base series and, in turn, the monthly indices based thereon. The final item basket for the 1993-94 series contained 538 items. While such a compromise has been considered necessary for the feasibility, as one may call it, of the monthly index, there is no denying the fact that the ability of the IIP to measure industrial growth has been severely affected. Further, although the contribution of the unregistered manufacturing sector (not covered in ASI) was included in the weighting diagram, this sector was not adequately represented in deriving the production relatives, as regular monthly production data remain hard to come by from the source data agency. Only 18 items representing the unregistered sector, which were included in the IIP in the 1980-81 series, continue to be included in the current IIP. Thus, the IIP has failed to adequately represent the unregistered sector in the overall index.

2.29 While the present statistical audit exercise is confined to All India IIP (Base 1993-94), it is pertinent to take note of the development that the CSO is likely to release in the near future a new series of All India IIP with base 2004-05 and for the new series also the existing source data agencies will supply the monthly production data to the CSO for the compilation of the IIP. In that context the DIPP informed important technical specifications in respect of outsourcing of data collection for the new series as per the Agreement signed between the DIPP & Centre for Monitoring Indian Economy Pvt. Ltd. (CMIE), a non-governmental agency (Annex. VIII). The major implication of the Agreement between DIPP& CMIE is that the DIPP is not confident of ensuring adequate response from the manufacturing units for regular monthly production data by itself under the Industrial Development and Regulation Act, 1951 and Scheduled Industries (Submission of Production Returns) Rules, 1979. The collection of monthly production data to be supplied by the DIPP and used by the CSO for the compilation of the new series of IIP (Base 2004-05) is, therefore, outsourced to the CMIE .The Agreement between the DIPP and the CMIE includes provisions for maintenance and updating (by CMIE) of the frame of units supplied by the CSO based on ASI 2004-05.

2.30 In the light of the above international experience of majority of the countries, the International Recommendations for IIP 2010, the recommendations of CFSA, the observations of the NSC chaired by Dr.C.Rangarajan and the outsourcing of the collection of monthly production data of manufacturing units by the DIPP to the CMIE Pvt. Ltd, **the considered assessment and recommendation of the Auditor is the following**:

- **The CSO, which is the nodal agency and accountable for the overall quality of the All India IIP, must assume full**

responsibility for arranging the collection of source data directly from the units, the processing of primary data and the compilation of All India IIP by mounting a monthly sample survey of industrial production in addition to the existing Annual Survey of Industries under the Collection of Statistics Act, 2008 and the Rules framed there under.

The Business Register and the IIP

2.31 The International Recommendations for IIP 2010 explain the use of a statistical business register in generating, through a sample survey, the requisite source data from industrial units for the compilation of the IIP. A statistical business register is a register of business units engaged in production of goods and/ or services. The business unit of the business register is usually the enterprise and has identifiable links to their establishments and is classified by economic activity. In an IIP context, the business register provides the basis from which a sampling frame is identified i.e. a list of all economic units in the industrial sector is selected from the business register to form the sampling frame. The sampling frame should include:

- all accurate and up to date data items associated with units that are required for stratification, sample selection and contact purposes, for example, industrial and geographical classifications, size codes, name, postal and location address and description of the unit, telephone and preferably a contact name; and
- all the active units, without omission or duplication, which are in the survey target population.

A selection of units from the sample frame is then made and it is from these units that IIP data are requested. This is referred to as the sample selection.

2.32 To keep the coverage of the business register as representative as possible, it must contain current information on its constituents. This means the register is maintained over time to take note of the changes in the enterprise dynamics. For example, an enterprise may merge, split up or go out of business; change production activities, or move location while new enterprises may be created (births) and existing enterprises may cease to exist (deaths). Unless the business register is regularly maintained, it will quickly lose its value as the source of sample frames/ selections.

2.33 In the International Recommendations for IIP 2010, it is recommended that:

- a business register provides the basis from which a sampling frame is identified;
- a sample survey be used as a way of minimizing response burden and lowering operational cost;
- the business register be maintained to ensure it remains as representative as possible and contains current information on its constituents; and
- the sample selection is updated each year to coincide with the update of index weights.

2.34 In the case of All India IIP (Base 1993-94), the frame of units maintained by some of the source agencies is not properly updated, and it leads to the problem of over/ under estimation of item-wise production data. The NSC chaired by Dr.C.Rangarajan in their Report (2001) observed that some shortcomings have been noticed in the frame of the units being maintained by the DCSSI, Office of Textile Commissioner, Directorate of Vanaspati and the DIPP. The frame of the units in use at DIPP for reporting industrial production was earlier maintained by the then Directorate-General of Technical Development (DGTD). This frame covers all industrial establishments within the purview of the Industrial Development and Regulation (IDR) Act. However, it is observed that after liberalisation and the transfer of work to DIPP, the frame has become incomplete in respect of coverage and inclusion of new units. In the pre-liberalisation days, the DGTD was in a position to update the frame on the basis of licenses issued. Now, with de-licensing of certain sectors, the DIPP remains unaware of the setting up of new units in these sectors and can suitably update the frame only when new units inform the DIPP of the commencement of production. Under these circumstances, the frame is very likely to be incomplete. For the same reason, it would continue to include units, which have gone out of existence.

2.35 In the present statistical audit exercise of All India IIP (1993-94), the original list of units supplied by the CSO as frame to the DIPP for regular collection of monthly production data could not be traced by the CSO as well as by the DIPP. The list of units currently being used by the DIPP is available but no comment is possible on the changes made in the original list as a result of updating over the years. The situation is likely to be the same with each of the other source data agencies. The completeness and representative character of the frame of units currently being used by the source data agencies for collection of monthly production data are, therefore, to say the least, questionable. Consequently, it is not possible to comment on the problem of under/ over estimation of item-wise monthly production data.

2.36 One of the important uses identified for the data collected in the Economic Census conducted periodically by the CSO is to prepare a Business

Register of establishments. The main purpose of conducting Economic Census is to generate an updated frame of establishments and their number and distribution across various industries and regions that forms the basis for the detailed follow-up surveys. In addition, in the Economic Census 2005, for the first time, a separate address slip was canvassed to collect data on the establishments employing 10 or more workers for compilation of a directory of establishments (a version of business register) having 10 or more workers. These data were published as Volume-II of the Economic Census Report, in electronic form. Though the directory is already prepared in electronic form, there are many problems that still need to be tackled with the help of the States/ UTs and the O/o Registrar General of India. The two important problems include; (i) the mismatch in the number of establishments obtained from the Establishments Schedule & the Address Slip, and (ii) the blank fields in the Directory. The proposed 2011 Economic Census, which wiil be used to update the directory of establishments prepared on the basis of the data of 2005 Census, needs better planning keeping in view the problems faced in the conduct of 2005 Economic Census. **Taking into account these welcome developments in the Economic Census in India and the international recommendations on the use of business register for planning a sample survey of industrial establishments to generate monthly production data for compiling the IIP, it s recommended that:**

- **all the necessary technical improvements be made in the 2011(sixth) Economic Census to enable the preparation of a comprehensive Directory of Establishments employing 5 or more workers (a Business Register) including data items associated with units that are required for stratification, sample selection and contact purposes;**
- **arrangements be made to update the information in the Directory on a continuing basis using relevant administrative data bases such as taxation of goods and services, etc., in the inter-census years; and**
- **the Directory be used to prepare a sampling frame of industrial units from which a representative and efficient sample of units can be drawn for collection of monthly production data required for the compilation of the All India IIP.**

IIP Compilation Frequency

2.37 The International Recommendations for IIP 2010 specify that the IIP be compiled monthly so that turning points in economic development can be

identified at the earliest possible point in time. The All India IIP (Base: 1993-94) is compiled monthly.

Variables and methods used to approximate industrial production for the IIP

2.38 The theoretical aim of the IIP is to reflect the volume developments in value added over time. However, the measurement of value added for the purposes of the IIP is difficult to achieve in practice, as it is generally not possible to calculate value added at high frequency in most countries. This is because the required data, in particular to calculate intermediate consumption, are generally not available at the required detail and/ or frequency. Therefore the challenge for compilers of an IIP is to obtain the best approximation of short-term movements in value added. These approximate measures of value added center on measuring the output of production and, in some cases, the inputs used in the production process. In general, the ratio of value added over output does not change significantly over short periods, and therefore justifies the use of changes in output to approximate changes in value added.

2.39 Output should be recorded at the time it is produced and valued at the same price whether it is sold, otherwise used or entered into inventories for sale or later use. The measurement of output is, however, undertaken in a number of ways for the purpose of constructing an IIP. Output can be measured in monetary terms (values) or in physical quantities. The IIP is intended to measure the change in the volume of value added over time. Therefore any change from price effects should be eliminated. Where value of output is used, the volume measure is obtained through the use of an appropriate price deflator. The price deflation process will ensure that any quality changes of the products are reflected in the production volume. Producer Price Indices (PPI) are to be used when current price values are deflated to achieve volume measures of output for the IIP. This is because the PPI directly measures product prices from the producer (both input and output product prices of the production process) and quality changes are usually taken into account. Also, price changes of items covered by the PPI for a product group are more likely to be similar to price changes of items not covered, than would be the case for volume changes. However, IIP compilers should first examine the details of the PPI indices available to ensure that: (i) they are representative of the value aggregate to be deflated (the price survey may differ from the survey used for the value aggregates); and (ii) quality changes do not significantly taint the PPI component measures. In circumstances where PPIs are unavailable, the next best alternative price deflators could be the Whole Sale Price Indices (WPI).

2.40 It is important to note the difference in the concepts of producer's price and wholesale price. The *producer's price* is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any VAT, or similar deductible tax, invoiced to the purchaser. It excludes any transport charges invoiced separately by the producer. The *wholesale price* would normally cover the price of product as it flows from the wholesaler to the retailer and it reflects purchasers' price which includes delivery charges and taxes on product such as sales taxes and VAT. The PPI is an index designed to measure the average change in the price of goods and services produced as outputs as they leave the place of production. The PPI historically is an outgrowth of programs developed to measure wholesale prices. The WPI (wholesale price index) attempts to measure price changes as they occur at one stage prior to final demand—the wholesale level. It includes products from domestic wholesalers and factories as they are delivered to retailers. As such, the WPI differs from the PPI because it includes both domestically produced products sold in the home market (included in the PPI) and imported products (excluded from the PPI), while excluding prices of exported products.

2.41 Physical quantity of output is also a data variable used to approximate industrial production. This approach measures product output in terms of the number of items, tonnes, liters, etc in order to track the development of production. These data are often used in the context of an IIP where the products are homogeneous. An aspect of using this output approach is that no deflation process is required. The physical quantity of output approach also aims to include goods and services produced whether they are sold, otherwise used or entered into inventories for sale or constitute "work-in-progress" inventories. The inclusion of work-in-progress can be more difficult to achieve with this method when compared to value of output methods. It is important to emphasize the issue of quality changes in regard to physical quantities. Quality is a term used to refer to characteristics of goods or services that make them distinguishable from each other from an economic point of view. These characteristics can change over time and are referred to as *quality change*. Quality changes to products should be included in the changes in volumes and therefore contribute to the compilation of the IIP. Misleading IIP results can occur where quality changes are not included in the change in volumes. The physical quantity of output approach to measuring industrial production is most suited to those industries that produce homogenous goods where quality remains constant over time, an example being the measurement of output of the coal industry. This is because coal of a specific grade is a homogeneous good, can be easily measured (in tonnes) and whose quality will remain constant over time. Ideally the physical quantity of output approach to measuring industrial production (or the volume extrapolation method) would be avoided if the products selected to compile

the IIP are subject to quality change. When an IIP is compiled using volume extrapolation method, including quality in the IIP calculation is more complex. Changes in quality can be incorporated into this approach via input data adjustments.

2.42 It is important that quality changes be incorporated into the calculation of the IIP. The method used to incorporate quality change into the IIP will, however, depend on the data sources and methods used to compile the index. A price index is used to incorporate quality when value of output and deflation method is employed, while adjusting input data is employed when volume extrapolation methods are used. In practice, the deflation method is preferred due to the reasons outlined above.

2.43 The International Recommendations for IIP 2010 note that it is not possible to recommend a single approach to obtain industrial production volumes, as the most appropriate methods and variables used will depend on the industrial activity of interest. However, general recommendations can be provided both in terms of methods and variables. In practice the two alternate methods, deflation and volume extrapolation, for achieving volume measures of industrial production are **_not_** considered to be equivalent. In general, the deflation process with the use of an appropriate price index is recommended. It is, however, acknowledged that for deflation to be carried out, a comprehensive suite of both value and price data need to be available.

2.44 The main reasons for recommending deflation are:

- Deflation more readily accommodates a heterogeneous product mix due to the relative stability of prices;
- Price relatives for a representative sample of goods and services can be used as typical for all goods and services in the same group in a way that volume measures would not be representative;
- Importantly, the quality changes associated with changing, new and disappearing products can be properly reflected when current values are deflated by price indices. It is more difficult to account for quality changes in a volume extrapolation approach. Price indices are generally constructed with a fixed basket approach that holds quality constant over time. The price index, therefore, measures pure price change ensuring any quality changes are reflected in the volume component. In a volume extrapolation process, there is no guarantee that the quality of two products are the same between two periods.

2.45 The Producer Price Index (PPI) is recommended as the price index to be used by countries when current price values are deflated to achieve

volume measures of output for the IIP. It is recommended that the deflator be applied to the value data at the lowest level possible but not higher than the ISIC class (4-digit) level in order to obtain a volume estimate for use in the compilation of the IIP. The detailed PPI used for deflation should be defined as closely as possible (in terms of scope, valuation and timing) to the respective product groups for which it is being used as a deflator.

2.46 The International Recommendations for IIP 2010 presents the results of the quality assessment of industrial production data variables and methods. The results are presented as the set of 'preferred', 'alternative' and 'other' methods and variables for each ISIC Revision 4 class (4 digit) in-scope of industrial production.

2.47 As stated earlier, the All India IIP (Base: 1993-94) is a quantum index, the production of items being expressed mostly in physical terms, **without any adjustment for quality changes in the items over time**. Consequently as mentioned above, misleading IIP results can occur where quality changes are not included in the change in volumes. However, the unit of reporting in respect of certain items like machinery, machine tools, ship building, etc. is in value terms. The monthly figure of production value in such cases is first deflated by the Wholesale Price Index (WPI) of the corresponding categories, released by the Office of the Economic Adviser, Ministry of Industry. India dose not have a Producer Price Index, although the IMF while assessing the quality of the WPI recommended the development of the PPI to meet the requirement of SDDS and in response to that recommendation the Office of the Economic Adviser, Ministry of Industry stated that technical assistance was being sought from the World Bank, which would cover switch over from the wholesale price based indices to producer price based indices (Report on the Observance of Standards and Codes (ROSC)—Data Module for India, IMF 2004).

2.48 In the light of the above International Recommendations and the situation obtaining in the All India IIP (Base: 1993-94), the following measures are recommended:

- **Examine the 'preferred', 'alternative' and 'other' methods and variables for each 4 digit NIC-2008 (based on ISIC Revision 4) in-scope of industrial production**;
- **Change the methods and variables to the 'preferred' categories in as many item groups as feasible**;
- **Identify the appropriate wholesale price indices relevant for use as price deflators, wherever deflated indicator is the preferred method**;

- **Make urgent efforts to develop the Producer Price Index for India so that a shift is possible in the near future from the WPI to the PPI**.

Index compilation (Type of index formula to be used)

2.49 The International Recommendations for IIP 2010 (IRIIP2010) advocate the use of Laspeyres index formula to construct the IIP. The All India IIP (Base: 1993-94) is a Laspeyres Index.

Managing non-response/ missing data

2.50 Missing data are estimated so that the data matrix is complete. This is called imputation. The IRIIP2010 recommend that missing data are to be estimated using imputation techniques or an administrative data replacement strategy so the data matrix is complete. There are a variety of imputation methods, ranging from simple and intuitive to rather complicated statistical procedures. Some of the more common methods are; (i) *Mean/modal value imputation*: impute the mean value of a variable for missing data; (ii) *Post stratification*: if a sample survey is used to collect monthly production data, divide the sample into strata and then impute stratum mean, mode or median; (iii) *Carry forward* the value for the reporting unit from the same survey occasion in the previous period, adjusted to reflect the average increase (decrease) of the data item in the stratum; and (iv) *Regression imputation*: use regression techniques to impute the missing data. Although a statistically advanced method, this last method needs a significant amount of available data in the historical part of the series and also in the independent variables used to explain the dependent variable at hand. The choice of method for imputation in an IIP context depends on the local statistical environment of the country concerned and is best handled on a case-by-case basis. Depending on the situation, some of these methods may yield very similar results.

2.51 Another way to manage non-response/missing data is to use administrative data as a replacement strategy. When available, administrative data can be modeled or substituted directly to fill data gaps.

2.52 There are also non-statistical ways to minimize non-response. These include (i) impressing upon respondents the importance of providing the requested data; (ii) sending reminders to non-respondents; and (iii) resorting to the enforcement measures laid down in national legislation.

2.53 In the case of All India IIP (Base: 1993-94), the CSO expects to have at least 60 per cent response in terms of production for release of the Quick Estimate and 80 per cent response at the time of final revision of the IIP. The

response rate is worked out on the basis of data supplied by the source agencies, which collect the data primarily through mail enquiry method. The Format for source agencies to supply the monthly production data contains information on "total number of units currently functioning, number of responding units, production of responding units, estimated production of non-responding units and total production"; for the current month, previous month and previous third month. The response position is quite good for some of the source agencies, but not satisfactory in respect of others

2.54 As stated earlier, the largest data source is the Department of Industrial Policy and Promotion (DIPP) of Ministry of Industry, which supplies data on as many as 213 out of 281 groups of items in the manufacturing sector, constituting more than 52 per cent in terms of weight of All-India IIP. The DIPP reported that:

- the response rate was maintained in the range of 80% to 85%(in terms of production) in the first month and 85% to 90% at the time of final revision (it was around 50% in April 2003). Further, the items for which less than five units were reporting production, the submission of production return by the concerned units was closely monitored to rule out any non-response.

The Auditor obtained from the DIPP unit-wise response details during the five months August to December 2010 for each item group for which 5 or more units were reporting production. If a particular unit did not report data in a month, the last reported monthly production data was repeated. Unit wise "period of non-response ending December 2010" was also obtained. These data were analysed by the Auditor and following were the findings in terms of the indicator "percentage of non-responding units for more than three months by December 2010":

0-10% for 23 item groups; 10-20% for 22 item groups; 20-30% for 29 item groups; 30-40% for 15 item groups; 40-50% for 15 item groups and 50 or above percentage for 37 item groups.

Obviously, the response situation for the units reported by the DIPP in terms of this indicator causes serious concern. Since the last reported monthly production was repeated and used as the estimated production for a non-responding unit irrespective of the length of the period of non-response, estimated production of non- responding units is not a satisfactory indicator of non-response as it cannot be assumed that there has been no change (increase/ decrease) in the production of the non-responding unit, whatever be the length of the period of non-response.

2.55 In some source agencies, letters are being issued regularly to the non-responding units and also to the units who do not furnish the monthly production data in time. Besides, units are vigorously pursued through e-mail and telephone.

2.56 It is also observed that the source agencies do not adopt any standard estimation techniques for estimating production of non-responding units, taking into account the past series of monthly production data. The source agencies have been adopting different procedures to estimate the monthly production of a non-responding unit; such as repetition of previous month's production, repetition of last reported production data till the unit reports its production again, average of previous three months, the average data of the preceding six months, estimation of item-wise production based upon installed capacity, etc. **There is need to take all possible steps to minimize non-response/missing data. It is further recommended that more efficient estimation procedure(s) than those followed at present should be developed for reliable estimation of production of non-responding units, which would, in turn, result into a more reliable series of IIP**.

Weighting variable – industry level of the index

2.57 The IRIIP 2010 recommend the Gross value added at basic prices data as the weight variable to compile the IIP for the levels of the ISIC structure. In the All India IIP (Base: 1993-94), Gross value added was used as the weighting variable at the industry level. The sectoral weights for Mining, Manufacturing and Electricity were allocated on the basis of Gross value added for 1993-94 as published in the National Account Statistics.   For the first time, the weighting diagram of IIP with base 1993-94 also took into account the contribution of the unorganised Manufacturing sector along with that of organized Manufacturing sector based on Annual Survey of Industries (ASI). For estimating the 1993-94 Gross value added for the unorganised sector, the data available in the follow-up Surveys of Economic Census viz. Directory Manufacturing Establishments (DME), Non-Directory Manufacturing Establishments (NDME) and Own-Account Manufacturing Enterprises (OAME), for the years 1989-90 and 1994-95 were used. After interpolating the GVA at 2-digit level, further allocation at 3/4 digit levels of NIC was done using the ratios of 1994-95 surveys, being in close proximity to the base year 1993-94. The consolidated contribution at 2/3/4 digit level of NIC were arrived at by super-imposing ASI data with unorganised sectors data for the corresponding groups/sub groups.

Weighting variable – product group level of the index

2.58 In the IRIIP 2010 it is recommended that "value of output" be used as the weight variable to compile the IIP at the product group level of the index. In the All India IIP (Base: 1993-94) allocation of weights to the items within 4-digit industry groups was done using "value of output" as available from ASI, 1993-94.

Updating the weights

2.59 The weights of an index need to be periodically updated in order to reflect the changing structure of the economy. Over time production levels shift in response to economic conditions. Some products and industries become more important while others become less important. In extreme cases products can disappear completely or entirely new products can enter the market. **The two key issues to consider when updating index weights are (a) the frequency of weight updates; and (b) the method used to incorporate new weights into the index structure.**

Frequency of weight updates

2.60 The frequency at which IIP weights are updated for the product groups and industry branches of the IIP can be linked to (i) the need to accurately reflect the current relative importance of product groups and industries; (ii) data availability; and (iii) the index type used to compile the index. The first of these is an important consideration because the prices of products change over time and therefore weights change. As the current period gets further and further away from the base period, the weights become more and more irrelevant because the substitution of less expensive products for more expensive products over time is not taken into account. Therefore, the credibility of the IIP is undermined. Keeping these considerations in view, in the IRIIP2010 it is recommended that the industry level weights of the IIP be updated annually with the latest weights available, as this will ensure that the IIP is an accurate indicator of volume growth. The latest weights available are likely to be from year t-2 or t-3. The frequent updating of weights may mitigate the substitution bias/changing weights problem. Reliable and timely annual weighting data for the industry levels of the index need to be available for inclusion into the IIP compilation process. Delays in the availability of annual weighting data will cause revisions to the IIP when the weights do become available and recalculations are made. It is also recommended that the product group weights be updated frequently (e.g. at least every 5 years) as this provides an opportunity to incorporate new products as well as reflect the changing relative importance of product groups within the industrial sector. The index type chosen to compile the IIP is also an important consideration when determining the frequency at which to update the IIP weights. The IRIIP 2010 recommends the IIP be compiled using the

Laspeyres-type index. The use of the Laspeyres-type index formula provides some flexibility in regard to the frequency of weight updates, as the weights are not derived from the current period.

Incorporating new weights into the IIP

2.61 In the IRIIP2010 it is recommended that the chain linking method should be used when weights are updated, i.e. the new series should be linked to the old series to produce a continuous series. The main advantages of the chain linking method are as follows:

- From an economic point of view, if the price of a particular good rises relative to all other goods in an economy because of an increase in demand, then price taking firms will tend to produce more of this good relative to other goods. Alternatively, consumers will tend to substitute away from goods that have become relatively more expensive to less expensive goods. Over time, the pattern of relative prices in the base period tends to become progressively less relevant to the economic situations of later periods to the point where it becomes inappropriate to continue using them to measure volume changes from one period to the next. Hence, with long time series, it is as inappropriate to use the most current weights for a date long in the past, as it is to use the weights from a long time in the past for the current period.
- Using a fixed-weight index to measure quantity changes in the presence of relative price changes will introduce substitution bias into the quantity index because information on relative price changes is not taken into account when measuring quantity changes. Moreover, the substitution bias usually becomes larger over time, as the fixed weights become more unrepresentative of those faced by agents when measuring quantity changes in more recent periods. Chaining fixed-weight indices helps to alleviate the substitution bias

2.62 As a general recommendation in the IRIIP2010 for **updating the weights** in the IIP, the chain approach and more specifically the Chained Laspeyres-type volume index, is the recommended one for the compilation of the IIP. In this way, when re-weighting occurs, the index is compiled with weights only for those periods to which they relate. In addition, industry level weights should be updated annually and product groups' weights should be updated frequently, at least every 5 years.

2.63 The international recommendations in 2010 for calculation methods, index weighting practices and linking and rebasing of index number series have changed from previous practices for the IIP. Historically, the production indices for the industrial sector were compiled using a fixed weight approach,

with weights updated at five-year intervals. However, new methods and approaches have been developed over the last several decades to address the deficiencies of these types of indices. The chain-linked approach, with annually updated industry level weights and five yearly updated product group level weights, has been the preferred approach in recent years and is the recommended method presented in the IRIIP2010.

2.64 The All India IIP is a fixed base Laspeyres Index and updating of weights at both industry level and product group level takes place whenever a new base year is adopted and the index series is revised. Thus when the All India IIP base year was changed from 1980-81 to 1993-94, the weights of the index related to 1980-81 were updated to those related to 1993-94. Similarly the weights of the All India IIP (Base: 1993-94) get updated in the new series of IIP with base 2004-05, which are scheduled for release in June 2011. The frequency at which All India IIP weights are updated is thus highly unsatisfactory. There is urgent need to change this situation, especially in the light of the recommended strategy in the latest IRIIP 2010. In fact the Advisory Panel on Transparency Standards constituted by the Committee on Financial Sector Assessment (CFSA) (set up by Ministry of Finance and the Reserve Bank of India) noted that:

- The IIP has been slow in reflecting the changing face of India's industrial sector. The IIP needs to adjust its basket of commodities and the weights assigned to these quicker than it does currently. To improve the methodology in compilation of IIP data, a move towards a chain-linked index instead of a base-linked index is recommended.

The CFSA in its Report (March 2009) appreciated the merits in moving towards a chain-linked index instead of a base-linked index in the compilation of IIP and price indices, given the fast-changing commodity sector profile due to modernisation and new technology but recommended that the full implications of the change in terms of coverage, consistency and continuity in time-series must be examined by the Government before implementation.

2.65 Data availability is an important consideration in deciding the frequency at which the weights are updated for the product groups and industry branches of the IIP. For the All India IIP, Gross value added, as published in the National Account Statistics, is used as the weighting variable at the industry level. Currently the annual Gross value added estimates at the industry level for registered manufacturing in the National Accounts Statistics are based on the results of the Annual Survey of Industries (ASI) as soon as these are available. The data on Gross value added per worker for unregistered manufacturing are, however, available at

approximately five yearly interval from the survey conducted by the NSSO as a follow-up survey to the Economic Census and are used whenever the base year for National Accounts Statistics is updated. The frequency of follow-up surveys to the Economic Census needs improvement, at least to alternate years in the inter-census period (usually about 5 years) so as to obtain more reliable estimates of Gross value added per worker for the unregistered manufacturing for use in the annual estimates of Gross value added in manufacturing. It is then possible to update the industry level weights for the All India IIP on an annual basis, using the Gross value added estimates as published in the annual National Accounts Statistics. In the All India IIP, allocation of weights to the items within 4-digit industry groups is done using "value of output" available from ASI and, therefore, there is no problem in updating the product/item groups' weights frequently, at least every 5 years. If these measures are taken, shifting from the present unsatisfactory fixed base Laspeyres Index with inordinately long delay in the revision of base year to the Chained Laspeyres-type volume index with annually updated industry level weights and frequently (at least five yearly) updated product group level weights will be feasible for the compilation of the All India IIP. It is then possible for India to derive benefit from the most important recommendation on index compilation in the IRIIP 2010. Guidance is provided in the IRIIP2010 on the implementation of the recommended approach – an annually chained IIP of the Laspeyres type with particular emphasis on procedures relevant to transition from a fixed weight index.

2.66 In the light of the above discussion, it is recommended that:

- A shift from the present fixed base Laspeyres Index to the Chained Laspeyres-type volume index with annually updated industry level weights and frequently (at least five yearly) updated product group level weights should be planned and implemented in the medium term (five year period) to improve the methodology in compilation of the All India IIP and better reflect the changing face of India's industrial sector.

Problems in the quality of weights used for the All India IIP

2.67 It is noted above that the ASI is the major data source for the weights used in the All India IIP at both the industry and product group levels. The reliability of these weights, therefore, depends on the quality of estimates of

Gross value added of industries at 4 digit level of NIC and value of output of product groups, derived from the ASI. The quality of these estimates is in turn impacted by the representative character of the set of surveyed units in the ASI. There are problems in selecting a representative set of units for collecting data in the ASI because of the imperfections in the sampling frame used for the ASI.

2.68 The sampling frame of ASI is based on the lists of factories/units maintained by the Chief Inspectors of Factories (CIF) in the States. The frame is normally revised once in three years but updated every year. While the revision takes into account both the addition of newly registered factories and the deletion of deregistered factories, the updating is confined only to the addition of new registrations. The CIF lists, however, suffer from two types of deficiencies: (a) many units that are eligible to be listed in the CIF list are not included in it; and (b) the units that have not been operating for quite some time are not removed from the CIF list. The National Statistical Commission (NSC) under the chairmanship of Dr. C Rangarajan in its Report (2001) estimated that the number of left out units in the CIF lists was about 1,45,000 during the year 1994-95. This number increased to 2,39,000 during 2005-06 according to the estimate quoted by G.C.Manna (Economic & Political Weekly, November 13, 2010 Vol XIV No 46). Examininig the problems of validation of ASI frame in the state of Rajasthan while conducting the data collection in the ASI, S.L.Menaria has observed that there is a considerable gap between the number of units selected for survey and the number actually surveyed, due to problems in validation and updating of ASI frame. On the other hand, the list maintained by CIF itself suffers from defects of omission of eligible units, duplication and inclusion of defunct units. His full paper is available at:
  http://mospi.nic.in/mospi_seminarseries_nov04_3_4_final.pdf
The NSC Report (2001) also noted that the lists maintained by the CIFs included a large number of units, which had not been operating for quite some time. An examination of data of six ASI rounds, i.e., from ASI, 1993-94 to ASI, 1998-99 revealed this deficiency to be of the order of 15 to 20 per cent of the number of units in the ASI frame.

2.69 Taking note of the inadequacies of the ASI frame, the NSC Report (2001) recommended that the CSO and the NSSO should take immediate steps to prepare directories of establishments (that employ at least 10 workers) based on data collected in the Economic Census and the follow-up enterprise surveys of Economic Census, respectively so that these could be made use of by the CIFs in their work of updating the lists maintained by them.

2.70 It may be recalled that the preparation of directories of establishments was attempted based on the data collected in the Economic Census 2005.This

issue has been further elaborated above in this report under the caption: **The Business Register and the IIP. In the light of the recommendations made in this report under the caption: The Business Register and the IIP, it is recommended that:**

- **The CIF lists be replaced by the Business Register, to be developed following the proposed sixth Economic Census 2011,for preparing a sampling frame of industrial units from which a representative and efficient sample of units can be drawn for collection of data in the ASI.**

2.71 The above recommendation will:

- **Be in accordance with that made in the International Recommendations on Industrial Statistics 2008;**
- **Ensure that the same sampling frame is used for the ASI as well as for the recommended survey on collection of monthly production data for use in the compilation of the All India IIP. and**
- **Improve the quality of the weights used in the All India IIP.**

Seasonal adjustment

2.72 According to the IRIIP2010 countries should consider producing and disseminating seasonally adjusted series as an integral part of their long-term programme of quality enhancement of their industrial production statistics. The main aim of seasonal adjustment is to filter out seasonal fluctuations and typical calendar effects within the movements of the time series under review, in order to uncover the important features of the series in relation to its evolution (trajectory) that is, the direction and magnitude of the changes that have taken place. In this way, the seasonally adjusted results do not show "normal" and repeating events rather, they provide an estimate for what is new in the series (change in the trend, the business cycle or the irregular component). Seasonal adjustment must be performed only when there is clear statistical evidence and economic interpretation of the seasonal/ calendar effects. The industry level (3or 4 digit) of the estimates at which to apply seasonal adjustment will depend on the level at which IIP compilers are able to produce reliable seasonal adjustment estimates. It is generally recommended to perform seasonal and working day adjustments at the lowest level provided that the data have sufficient accuracy to enable reliable adjustment to be performed.

2.73 The seasonally adjusted data and the estimated trend/trend-cycle complement the original data, but they cannot replace the original data for the following reasons:

i) Unadjusted data are useful in their own right. While the non-seasonally adjusted data show the actual economic events that have occurred, the seasonally adjusted data and the trend-cycle estimates represent an analytical elaboration of the data designed to show the underlying movements that may be hidden by the seasonal variations. Thus, compilation of seasonally adjusted data, exclusively, represents a loss of information.

ii) No unique solution exists on how to conduct seasonal adjustment.

iii) Seasonally adjusted data are subject to revisions as future data become available, even when the original data are not revised.

2.74 In the case of All India IIP, seasonal adjustment has not been done so far and no official seasonally adjusted series is available. It may be recalled that at the meeting with the major users of IIP held at the CSO on 2 December 2010, there have been requests from the RBI, CITI Group and PHDCCI that the seasonally adjusted IIP may also be released by the official agency and the CSO agreed that the issue of compilation of seasonally adjusted IIP would be sent for consideration of the Standing Committee on Industrial Statistics (SCIS) of MOS&PI. **Taking into account the international recommendations and the requests from major public and private users, following recommendations are made:**

- **Seasonal adjustment of All India IIP should be taken up as an official responsibility by the CSO.**
- **Only the finally revised series of the All India IIP should be used for seasonal adjustment.**
- **Experimenting with various possible alternative methods and subjecting the seasonal adjustment results to validation using a wide range of quality measures, evolve an appropriate method of seasonal adjustment. Among others, the absence of residual seasonal and/or calendar effects as well as the stability of the seasonally adjusted pattern has to be carefully assessed. The results of the experimental exercises may be released as a research study.**
- **Release the official seasonally adjusted series of the All India IIP along with details of the methodology used.**

Reconciliation of IIP data with other data sources

2.75 In the IRIIP2010, it is recommended that the IIP could be reconciled with other data sources essentially in an attempt to identify any significant quality issues. This reconciliation could occur against various data sources, one of which could be the annual national accounts. These comparisons could then result in improvements to the production of the index in future periods, for example, improving or changing IIP data sources. The comparison of the IIP to, say, the annual surveys that measure value added is suggested as annual data are available and are collected to obtain a measurement of both output and intermediate consumption – the difference being value added. Volume measures are then obtained using the double deflation approach. This approach to measuring value added is rarely possible with the monthly IIP and therefore, various variables to approximate value added are collected. It, therefore, seems sensible that the data obtained from the various sources be examined to determine if they present a consistent message about the economy to users. It is acknowledged that the methods used to measure value added at annual and sub annual frequencies is likely to produce some discrepancy in the results due to the conceptual and practical issues. However, further examination of the data results (both sub-annual and annual) are required where the discrepancies cannot be explained by these conceptual or practical issues.

2.76 In India the contribution of the registered manufacturing sector to Gross National Product (GNP) is computed from the data generated through the ASI. Since there is some delay in the publication of ASI results, the estimate of GNP for this sector is often computed indirectly by using the All India IIP, which is released by the CSO every month. The estimate of GNP for the registered industrial sector in the base year of the All India IIP is appropriately multiplied by the IIP of the current year to arrive at the required GNP in the current year. The main use of All India IIP is to study the current economic scenario and it is generally felt that the problem of volatility of current series of IIP is due to continuance of 1993-94 base and to get a real picture in the longer period ASI result is more accurate than IIP.

2.77 There are three important studies comparing growth rates obtained from All India IIP (Base: 1993-94) and the ASI. These are:

- Comparative Study of Industrial Growth as measured by IIP & ASI, by R. K. Kamra and S. Chakraborty available at **http://mospi.nic.in/mospi_seminarseries_nov04_3_7_final.pdf**

- Index of Industrial Production & Annual Survey of Industries, by M.C. Singhi available at
  http://eaindustry.nic.in/Research_Studies/IND_DATA_Revised.pdf

- Industrial statistics in India sources, limitations and data gaps, by M. R. Saluja and BhupeshYadav available at
  http://www.idfresearch.org/Industrial-statistics-India.pdf

2.78 In the first paper by Kamra and Chakraborty, comparison of growth pattern in the All India IIP (Base: 1993-94) for Manufacturing Sector and then at 2-digit level of NIC-87 with corresponding indices derived from the ASI output data has been undertaken. An index has been developed for the ASI Value of Output both at the two digit and overall manufacturing sector by using the suitable **wholesale price** indices as deflators for the ASI estimates of value of output at the current prices and then by expressing the data as percentage of 1993-94 ASI figures for the value of output at constant prices. Methodology employed was Graphical analysis and a nonparametric test based on Spearman Rank Correlation coefficient. The conclusion of the study is that the association between IIP and ASI indices is strong up to the year 1998-99 and after the year 1998-99, this association starts weakening which is expected since IIP is a short-term indicator of industrial growth in the country. As the year being observed moves away from the base year, differences in structural composition of items widen. It indicates the need for revising the base year frequently.

2.79 In the second research study by M.C.Singhi, comparison is attempted among three data series: All India IIP (Base: 1993-94), ASI and the relevant National Account Statistics (NAS) Gross value added. IIP and the index constructed of its three broad groups from NAS for the years 2000-01 and 2008-09 indicate that while these two indices converge for electricity sector, considerable differences exist for mining and manufacturing sectors. NAS based index is higher for mining sector while IIP is higher for the manufacturing sector. Further, comparable indices and annual growth rates for the years 1993-94 to 2007-08 and Compound Average Annual Growth Rate (CAGR) for the period are compiled for NAS (OS)- National Accounts-Organised Manufacturing Sector; ASI (VA)- Annual survey of Industries- Value Added; ASI (O)-Annual Survey of Industries- Output; IIP- Index of Industrial Production; IIP (C)- IIP Chain based index; NAS (TM)- National Accounts-Total Manufacturing. There are significant inter year variations, as is evident from the annual rate of growth (and also the indices) observed for various indices. It is, however, interesting to note that in the first four years of the release of IIP series, all the indices of manufacturing sector performance move almost together. A break occurs afterwards and deviations tend to get

wider. The variations in the indices so constructed and growth rates of IIP and NAS/ASI could either be due to weights, item basket, response quantity and quality or a combination of one or more of these factors. There is a disconnect between ASI and IIP during 1997-2000. It has, therefore, been considered important to look at the correlation between IIP and ASI indices including the correlation in the growth rates by breaking the series into two with the first series comparing the indices and growth rates for the period 1993-2000 and the second comparing it for the period 2000-2008. It is observed that the correlation between the indices is significantly lower during the period 1993-94 to 2000-2001. However, at the level of growth rates, the association becomes weak during the second period. CAGR during 1993-2008 indicates IIP growth is higher compared with ASI (VA) and lower for ASI (output). Average mean difference, however, is less than 1 per cent each year. The study also includes similar results at 2 digit level industries in manufacturing.

2.80 The third study by M.R. Saluja and Bhupesh Yadav gives the GVA for the organised manufacturing based on the ASI results as well as those obtained by applying IIP's and index numbers of wholesale prices to the estimates of the previous year based on ASI, for 1998-99 and1999-2000. It may be noted that for the entire registered sector the difference between the two sets of estimates is 3% for 1998-99 and 2% for 1999-2000. However, NAS between 2000-01 and 2003-04 used IIP and Index of wholesale prices for estimating the value added for the registered manufacturing sector in place of the estimates based on ASI data. For 1999-2000 these estimates are based on ASI data. The reason for using IIP as a source for estimating value added, given in NAS Sources and Methods 2007, is that growth rates according to ASI data are different from the growth rates obtained by using IIP and Index of wholesale prices. This logic is surprising. Using 1999-2000 as the base year for NAS, the growth rate of GVA for registered manufacturing is higher according to NAS than according to ASI for the years 2000-01 to 2004-05. The maximum difference is 22% for 2001-02 and the minimum 4.5% for 2004-05.This study also contains similar results at 2 digit level industries in registered manufacturing.

2.81 The base year for NAS has been revised from 1999-2000 to 2004-05 and since then ASI results have again been used, when these have become available, for estimating the value added for the registered manufacturing sector. It is thus clear that coherence between the growth rates obtained from IIP and ASI has an important bearing on the estimation of value addition in the registered manufacturing in the NAS and for this important reason it is essential to ensure that both the All India IIP and ASI are placed on more sound footing than at present.

2.82 It is recommended that the CSO, being directly accountable to the public for the results of the All India IIP, ASI and NAS, should undertake regular reconciliation exercise of All India IIP data with those of ASI and NAS to identify any significant quality issues and place the results of reconciliation first before the Standing Committee on Industrial Statistics (SCIS) and thereafter in the public domain.

Presentation of the IIP data

2.83 The IRIIP2010 advocates the following principles for presentation of IIP data:

- Both trading day adjusted data series and seasonally adjusted data series to be published;
- Index numbers rather than monetary values should be used to present industrial production volume measures;
- Index numbers to be presented to one decimal place;
- Changes between month-to-month and change from the same month one year earlier to be presented;
- A reference period needs to be determined and convention is that this period is set to an index number of one hundred (100.0). Index numbers for all subsequent periods are percentages of the value for the reference period;
- The main contributors to change to be presented to users. That is, those product groups or industries that are primarily responsible for the monthly movement in the IIP; and
- Long (at least 5 years) and coherent time series to be provided to users

2.84 For the All India IIP (Base: 1993-94):

- **Neither trading day adjusted data series nor seasonally adjusted data series is published. It is recommended that these be attempted and after stabilizing the methodologies published along with the adopted methods.**
- Index numbers are used to present industrial production volume measures.
- Index numbers are presented to one decimal place.
- Change from the same month one year earlier is presented. The cumulative change for the period April to the current month over the corresponding period of the previous year is also given. Change from month to month is, however, not presented and the users can derive it

since indices for all the months since April for the current and last years are presented.

- 1993-94 is the reference (as well as base) period and the index is set to 100 for 1993-94 and index numbers for all subsequent periods are percentages of the value for the reference period.
- **After the meeting with the users of All India IIP held on 2 December, 2010 as part of the present statistical audit process, based on the suggestion of the users the CSO started indicating the main items responsible for the increase/decrease in the growth of the IIP in the monthly Press Note on IIP. This practice should be continued.**
- Comparable annual averages of IIP for the last 10 years at 2-digit level of industries are provided to the users in the monthly Press note on IIP.

Presentation of the IIP – metadata

2.85 According to the IRIIP2010 the following metadata should be provided:

- Precise definitions of the underlying economic concepts the indices intend to measure;
- Specific mention of any limitations in the use or application of the indices;
- Descriptions of the methodologies used in the compilation of the index, with particular reference to the index calculation methods entailing the choice of index formula and the strategy for constructing the index series;
- Weighting system used, weight revision practices and frequency of weight revision;
- Computation at various aggregation levels, selection of base year (weight reference period), frequency of re-basing and procedures for linking indices;
- Treatment of changes in the composition of commodities in the market as well as changes in quality; and
- Comparison of the methodologies applied with underlying index concepts and a description of the impact of departures

2.86 For the All India IIP (Base: 1993-94) the following references provide most of the aspects of the metadata:

- An Overview of Revision of Base Year of All India Index of Industrial Production, by Central Statistics Office, India, and available at: **http://mospi.nic.in/Mospi_New/upload/iip_overview.htm**

- Manual on Index of Industrial Production (IIP), by the CSO and available at: **http://mospi.nic.in/Mospi_New/upload/manual_iip_23oct08. pdf**

- The metadata for IIP, in the format prescribed by IMF, placed on the DSSB of IMF for SDDS and country India, Real Sector, Production index and available at: **http://dsbb.imf.org**

Dissemination of the IIP

2.87 The IRIIP2010 made the following recommendations for the dissemination of the IIP:

- Data to be released as soon as possible (noting the trade off between timeliness and quality);
- Data released according to a set timetable;
- Confidentiality of individual survey respondents to be maintained;
- Data to be made available to all users at the same time;
- Consistent presentation and reporting practices over time;
- Weights by industry to be made available to users;
- Data to be accompanied by the methodological explanation and advice;
- Data to be accompanied by commentary that assists users to make their own judgments about the economic implications, i.e. the commentary should not make any assessment of current government policies;
- Contact details of relevant statisticians who can answer various questions by users to be included with the release of data.

2.88 In respect of the All India IIP (Base: 1993-94) following is the situation:

- The provisional data are used for computing the quick index for a given month, which is released by the CSO in six weeks;
- The quick index (with a time lag of six weeks) is released on 12th of each month or on previous working day if 12th happens to be a Government holiday;
- Confidentiality of individual respondent unit supplying monthly production data is maintained;
- Data are made available to all users at the same time by releasing the Press Note on the scheduled date and time (11.00 hrs.) on the ministry's website: **http://mospi.gov.in/**
- Consistent presentation and reporting practices in the Press Note are followed over time;

- Weights by industry are made available in the Press Note to users;
- Data are **not** accompanied by the methodological explanation and advice, but metadata on IIP is placed on web as indicated in the previous section on **Presentation of the IIP-metadata** and **it is recommended that a reference to the place (or website) of availability of metadata be included in the Press Note on IIP**.
- Data are accompanied by statistical commentary only in the Press Note that assists users to make their own judgments about the economic implications, i.e. the commentary dose not make any assessment of current government policies;
- **Contact details of relevant statisticians who can answer various questions by users are at present not included with the release of Press Note and it is recommended to include the same in the Press Note**.

Data revisions

2.89 Revisions in IIP data occur as a consequence of the trade-off between the need for timeliness of published data and their reliability, accuracy and comprehensiveness. To meet user needs, national statistical offices compile timely preliminary estimates that are revised later when new and more accurate information becomes available. Although, in general, repeated revisions may be perceived as reflecting negatively on the reliability of official industrial statistics, the attempt to avoid them by producing accurate but rather outdated data will result in failing to satisfy the users' needs, particularly for the IIP where its advantage is its combination of high frequency and fast availability.

2.90 In general, there are two reasons for revisions - (i) revisions due to "normal" statistical procedures (for instance new information available, change in the methodology, change in data source, change of base year); and (ii) revisions due to the correction of errors that may occur in source data or in processing. There is a need to develop a revision policy for normal statistical data revisions. The development of a revision policy should aim to provide users with the necessary information to cope with revisions in a more systematic manner. The IRIIP 2010 recommended that the following revision practices should be followed by countries:

- It is important to consult main users of official statistics to identify needs and priorities specific to individual countries;
- The revision cycle should be relatively stable from year to year. Users place great importance on a revision schedule that is regular;

- A statement by the national statistics office about the reasons and scheduled revisions should be made public and readily accessible to users;
- Major conceptual and methodological revisions should usually be introduced as required, balancing need for change and users' concerns;
- Revisions should be carried back several years to give consistent time series;
- Details of revisions should be documented and made available to users. The basic documentation should identify data in the statistical publications that are preliminary (or provisional) and revised, explaining the sources of revisions, and explaining breaks in series when consistent series cannot be constructed; and
- Users should be reminded of the size of the likely revisions based on past history.

2.91 The practice with the All India IIP is as follows:

- The users represented in the Standing Committee on Industrial Statistics are frequently consulted to identify their needs and priorities, but in general no such interaction and consultation with other users takes place frequently. As part of the current statistical audit process an interactive meeting was held with the major official and non-official users, and their response, intelligent suggestions and comments were very useful. **It is recommended that the CSO should hold meetings with users of the All India IIP at least twice in a year and benefit from their feedback so as to improve the credibility and public trust of the index.**
- The revision cycle has been stable for the All India IIP (Base: 1993-94) from year to year. On the basis of revised production data received later from the source agencies, this index is revised subsequently in the next month and finally, two months thereafter, along with the quick index.
- A statement by the CSO is prepared about the reasons and scheduled revisions, whenever index base revision or any redistribution of weights among item groups in between base revisions take place, and is made public and readily accessible to users. The reasons for changes in the magnitudes of quick index, first revision index and final index are, however, not made public on a regular basis. The Committee on Financial Sector Assessment (CFSA) in its Report stated that the CSO could further improve the transparency of the IIP if it reveals the size (number) of units in the frame, the sample size and the monthly response rate for each item of the IIP. It further recommended that the publication of the response rate with each release would also

enable users to anticipate changes in the estimates and appreciate the revisions when they occur. In the background of the international recommendation and that of the CFSA, **it is recommended that the CSO should improve the transparency of the All India IIP by giving the response rates and the reasons for the revisions in the index in the monthly Press Note**.

- The CSO makes use of the consultative mechanism of the Standing Committee on Industrial Statistics to introduce major conceptual and methodological revisions in the IIP as required, balancing need for change and users' concerns.

- Revisions in the IIP are carried back several years by the CSO to give consistent time series, whenever index base revision or use of revised wholesale price indices for deflation take place and such revised IIP back series are made public to meet user requirements. **It is recommended that breaks in series should be explained when consistent series cannot be constructed**.

- Detailed documentation of revisions carried out in the quick and first revision indices of industrial production, explaining the sources of revisions, is not done and made available to the users by the CSO, although four types of validation checks as stated below are carried out at CSO every month by preparing validation tables and correspondence with the source agencies is made whenever necessary, after receiving the monthly production data:

  (i)   More than 10% difference in production data of First Revision & Final Revision.

  (ii)   More than 20% difference in production data of Quick Estimates & First Revision.

  (iii)   More than 20% difference in production data of Current month as compared to the previous month.

  (iv)   More than 30% difference in production data of the current month as compared to the final data of the corresponding month of the previous year.

2.92 It is recommended that detailed documentation of revisions carried out in the quick and first revision indices of industrial production, explaining the sources of revisions, should be done and made available to the users by the CSO.

Strengthening manpower resources for the All India IIP work at the CSO

2.93 It has earlier been recommended that:

- The CSO, which is the nodal agency and accountable for the overall quality of the All India IIP, must assume full responsibility for arranging the collection of source data directly from the units, the processing of primary data and the compilation of All India IIP by mounting a monthly sample survey of industrial production in addition to the existing Annual Survey of Industries under the Collection of Statistics Act, 2008 and the Rules framed there under.

To implement the above recommendation:

- **It is further recommended that a separate assessment may be made by the CSO to estimate the manpower and financial resources required for mounting a monthly sample survey to collect directly from the units industrial production data for use in the compilation of the All India IIP and these resources be provided.**
- **For handling the regular work of the All India IIP making use of the monthly production survey data and bringing about the recommended improvements in the index, the following staff composition is recommended at the CSO:**

Deputy Director General	**1**
Director/Joint Director	**1**
Deputy Director	**1**
Assistant Director	**2**
SHO/Investigator/DEO	**30**

CHAPTER-III

STATISTICAL AUDIT FRAMEWORK FOR STATISTICAL PRODUCTS

3.1 The NSC has been mandated to exercise **statistical audit** over the statistical activities to ensure quality and integrity of the statistical products. The NSC has ordered the current statistical audit of the All India IIP (Base: 1993-94) as a **test case**, before laying down comprehensive methodology for future statistical audits. In the meeting with the CSO and Source Data Agencies of the All India IIP, held under the chairmanship of the CSI on 25 August 2010, the CSI pointed out that the statistical audit is being done for the first time in India and requested the Auditor to evolve methodology of statistical audit in general, which could be adopted for the statistical products. Keeping in view this important requirement, considerable time and effort has been spent in reviewing the international developments and experience on the subject of **statistical audit** and how it differs from financial and other types of audits. In this context two important references are:

(i)   Final Report on State of the art concerning the auditing activity in National Statistical Institutes, submitted to Leadership Group on Quality, EUROSTAT, 2003 available at:
http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/G0-LEG-20030930/DE/G0-LEG-20030930-DE.PDF

(ii)   Handbook on Data Quality Assessment Methods and Tools (EUROSTAT, 2007) available at:
http://unstats.un.org/unsd/dnss/docs-nqaf/Eurostat-HANDBOOK%20ON%20DATA%20QUALITY%20ASSESSMENT%20METHODS%20AND%20TOOLS%20%20I.pdf

3.2. In the introductory chapter of this report, the question: "What is Statistical Audit?" has been addressed in paragraphs 1.8 and 1.9 and the country experiences on statistical audit have been reviewed in respect of five countries: Sweden, United Kingdom (UK), Portugal, Canada and Netherlands in paragraphs 1.17 to 1.39. **On careful consideration of the country experiences in the context of the salient features of the decentralized Indian Statistical System, it is recommended that the UK Model is the most appropriate guide for instituting a system of statistical audits in India under the mandate of the National Statistical Commission**. The salient features of the UK Model have been elaborated in paragraphs 1.18 to 1.27 along with relevant reference documents and the web sites at which these documents can be accessed.

3.3 In paragraph 1.10 international developments on notion of quality assurance for statistical processes and products have been reviewed and it has been noted that so far, there is no generic internationally agreed national quality assurance framework that can be used by a national statistical office to describe systematically how it assures quality, what its current quality concerns are and how it plans to introduce new quality assurance procedures. Such a generic framework would require a broad consensus regarding the notion of quality and would need to build on the frameworks developed thus far. **It is recommended that India should start thinking on the development of its own National Quality Assurance Framework, benefiting from its participation in the current deliberations of UN Statistical Commission and the outcome of the efforts of the United Nations Expert Group on National Quality Assurance Frameworks and making use of the mandate of the National Statistical Commission. Such a National Quality Assurance Framework, if and when developed by India, will provide the umbrella to the NSC for conducting statistical audit over the statistical activities to ensure quality and integrity of the statistical products.**

Manpower Resources for Statistical Audit Function

3.4 There is separate Monitoring and Assessment Team in the UK Statistics Authority (similar to NSC in India), which systematically reviews the evidence from producers, users and other stakeholders against the Code of Practice. The Head of Assessment is a member of the Board of the UK Statistics Authority. The post of Head of Assessment is a statutory post under the provisions of the Statistics and Registration Service Act 2007. The Head of Assessment is the Authority's principal adviser on the scrutiny of official statistics. The current Head of Assessment is a career statistician who has worked in a number of government organisations. Statistical Audit function is a time consuming one and requires attention of a dedicated team under the direct charge of the Chairman, NSC. How to constitute such a dedicated statistical audit team is an issue that requires careful consideration. **It is recommended that:**

- **An external statistical audit team leader should be selected for a specific audit on short –term contract from outside the Government to ensure impartial and independent audit report;**
- **The external audit team leader should be supported by a high ranking officer (an Additional Director General level experienced statistician) appointed by the NSC in the NSC Secretariat as Head of Statistical Audit Division on a statutory**

basis for a period of five years, who will report directly to the Chairman of the NSC;

- One Deputy Director General, one Director/Joint Director, two Deputy Directors and appropriate technical and administrative support staff should assist the Head of Statistical Audit Division.

CHAPTER-IV

SUMMARY AND RECOMMENDATIONS

The following are the Recommendations along with brief summary of the context of a recommendation, wherever necessary.

1.   Scope of the All India IIP: The scope of the All India IIP (Base 1993-94) may be enlarged in line with the scope of IIP recommended in the International Recommendations for IIP 2010 to cover additional economic activities for "gas, steam and air-conditioning supply; Water supply, sewerage, waste management and remediation activities" in case these economic activities are significant contributors to value addition in the Indian economy.

(Paragraph 2.24)

2.   Industrial Classification: As the All India IIP should use an industrial classification compatible with the one used in ASI, NIC-2008 based on ISIC Rev.4 is the suitable classification for All India IIP.

(Paragraph 2.25)

3.   Sources of Data: The CSO, which is the nodal agency and accountable for the overall quality of the All India IIP, must assume full responsibility for arranging the collection of source data directly from the units, the processing of primary data and the compilation of All India IIP by mounting a monthly sample survey of industrial production in addition to the existing Annual Survey of Industries under the Collection of Statistics Act, 2008 and the Rules framed there under.

(Paragraph 2.30)

4.   The Business Register and the IIP: Taking into account the welcome developments in the Economic Census in India and the international recommendations on the use of business register for planning a sample survey of industrial establishments to generate monthly production data for compiling the IIP, it s recommended that:

- All the necessary technical improvements be made in the 2011(sixth) Economic Census to enable the preparation of a comprehensive Directory of Establishments employing 5 or more workers (a Business Register) including data items associated with units that are required for stratification, sample selection and contact purposes;

- Arrangements be made to update the information in the Directory on a continuing basis using relevant administrative data bases such as taxation of goods and services, etc., in the inter-census years; and
- The Directory be used to prepare a sampling frame of industrial units from which a representative and efficient sample of units can be drawn for collection of monthly production data required for the compilation of the All India IIP.

(Paragraph 2.36)

5.   **Variables and methods used to approximate industrial production for the IIP:** The All India IIP is a quantum index, the production of items being expressed mostly in physical terms, **without any adjustment for quality changes in the items over time.** Consequently, misleading IIP results can occur where quality changes are not included in the change in volumes. However, the unit of reporting in respect of certain items like machinery, machine tools, ship building, etc. is in value terms. The monthly figure of production value in such cases is first deflated by the Wholesale Price Index (WPI) of the corresponding categories, released by the Office of the Economic Adviser, Ministry of Industry. Where value of output is used, the volume measure is obtained through the use of an appropriate price deflator. The price deflation process will ensure that any quality changes of the products are reflected in the production volume. Producer Price Indices (PPI) are to be used when current price values are deflated to achieve volume measures of output for the IIP. This is because the PPI directly measures product prices from the producer (both input and output product prices of the production process) and quality changes are usually taken into account. India dose not have a Producer Price Index. The International Recommendations for IIP 2010 present the results of the quality assessment of industrial production data variables and methods. The results are presented as the set of 'preferred', 'alternative' and 'other' methods and variables for each ISIC Revision 4 class (4 digit) in-scope of industrial production.

In the light of the International Recommendations for IIP2010 and the situation obtaining in the All India IIP (Base: 1993-94), the following measures are recommended:

- Examine the 'preferred', 'alternative' and 'other' methods and variables for each 4 digit NIC-2008 (based on ISIC Revision 4) in-scope of industrial production;
- Change the methods and variables to the 'preferred' categories in as many item groups as feasible;
- Identify the appropriate wholesale price indices relevant for use as price deflators, wherever deflated indicator is the preferred method;

- Make urgent efforts to develop the Producer Price Index for India so that a shift is possible in the near future from the WPI to the PPI.

(Paragraphs 2.39, 2.47 & 2.48)

6. **Managing non-response/ missing data:** There is need to take all possible steps to minimize non-response/missing data. More efficient estimation procedure(s) than those followed at present should be developed for reliable estimation of production of non-responding units, which would, in turn, result into a more reliable series of IIP.

(Paragraph 2.56)

7. **Updating the weights for the All India IIP:** Data availability is an important consideration in deciding the frequency at which the weights are updated for the product groups and industry branches of the IIP. For the All India IIP, Gross value added, as published in the National Account Statistics (NAS), is used as the weighting variable at the industry level. Currently the annual Gross value added estimates at the industry level for registered manufacturing in the NAS are based on the results of the Annual Survey of Industries (ASI) as soon as these are available. The data on Gross value added per worker for unregistered manufacturing are, however, available at approximately five yearly interval from the survey conducted by the NSSO as a follow-up survey to the Economic Census and are used whenever the base year for National Accounts Statistics is updated. It is recommended that the frequency of follow-up surveys to the Economic Census needs improvement, at least to alternate years in the inter-census period (usually about 5 years) so as to obtain more reliable estimates of Gross value added per worker for the unregistered manufacturing for use in the annual estimates of Gross value added in manufacturing. It is then possible to update the industry level weights for the All India IIP on an annual basis, using the Gross value added estimates as published in the annual NAS. In the All India IIP, allocation of weights to the items within 4-digit industry groups is done using "value of output" available from ASI and, therefore, there is no problem in updating the product/item groups' weights frequently, at least every 5 years. If these measures are taken, shifting from the present unsatisfactory fixed base Laspeyres Index with inordinately long delay in the revision of base year to the Chained Laspeyres-type volume index with annually updated industry level weights and frequently (at least five yearly) updated product group level weights will be feasible for the compilation of the All India IIP. It is then possible for India to derive benefit from the most important recommendation on index compilation in the IRIIP 2010. Guidance is provided in the IRIIP2010 on the implementation of the recommended approach – an annually chained IIP of the Laspeyres type with particular emphasis on procedures relevant to transition from a fixed weight index.

In the light of the above discussion, it is recommended that:

A shift from the present fixed base Laspeyres Index to the Chained Laspeyres-type volume index with annually updated industry level weights and frequently (at least five yearly) updated product group level weights should be planned and implemented in the medium term (five year period) to improve the methodology in compilation of the All India IIP and better reflect the changing face of India's industrial sector.

(Paragraphs 2.65 & 2.66)

8. **Problems in the quality of weights used for the All India IIP**: It is noted above that the ASI is the major data source for the weights used in the All India IIP at both the industry and product group levels. The reliability of these weights, therefore, depends on the quality of estimates of Gross value added of industries at 4 digit level of NIC and value of output of product groups, derived from the ASI. The quality of these estimates is in turn impacted by the representative character of the set of surveyed units in the ASI. There are problems in selecting a representative set of units for collecting data in the ASI because of the imperfections in the sampling frame used for the ASI. The sampling frame of ASI is based on the lists of factories/units maintained by the Chief Inspectors of Factories (CIF) in the States. The CIF lists, however, suffer from two types of deficiencies: (a) many units that are eligible to be listed in the CIF list are not included in it; and (b) the units that have not been operating for quite some time are not removed from the CIF list.

It is recommended that: The CIF lists be replaced by the Business Register, to be developed following the proposed sixth Economic Census 2011,for preparing a sampling frame of industrial units from which a representative and efficient sample of units can be drawn for collection of data in the ASI.

The above recommendation will: (i) be in accordance with that made in the International Recommendations on Industrial Statistics 2008; (ii) ensure that the same sampling frame is used for the ASI as well as for the recommended survey on collection of monthly production data for use in the compilation of the All India IIP and (iii) improve the quality of the weights used in the All India IIP.

(Paragraphs 2.67, 2.68, 2.70 & 2.71)

9. **Seasonal adjustment**: Taking into account the international recommendations and the requests from major public and private users, following recommendations are made:

- Seasonal adjustment of All India IIP should be taken up as an official responsibility by the CSO.
- Only the finally revised series of the All India IIP should be used for seasonal adjustment.
- Experimenting with various possible alternative methods and subjecting the seasonal adjustment results to validation using a wide range of quality measures, evolve an appropriate method of seasonal adjustment. Among others, the absence of residual seasonal and/or calendar effects as well as the stability of the seasonally adjusted pattern has to be carefully assessed. The results of the experimental exercises may be released as a research study.
- Release the official seasonally adjusted series of the All India IIP along with details of the methodology used.

(Paragraph 2.74)

10. **Reconciliation of IIP data with other data sources**: The CSO, being directly accountable to the public for the results of the All India IIP, ASI and NAS, should undertake regular reconciliation exercise of All India IIP data with those of ASI and NAS to identify any significant quality issues and place the results of reconciliation first before the Standing Committee on Industrial Statistics (SCIS) and thereafter in public domain.

(Paragraph 2.82)

11. **Presentation of the IIPdata**: Neither trading day adjusted data series nor seasonally adjusted data series is published for the All India IIP. It is recommended that these be attempted and after stabilizing the methodologies published along with the adopted methods. After the meeting with the users of All India IIP held on 2 December, 2010 as part of the present statistical audit process, based on the suggestion of the users the CSO started indicating the main items responsible for the increase/decrease in the growth of the IIP in the monthly Press Note on IIP. This practice should be continued.

(Paragraph 2.84)

12. **Dissemination of the IIP**: A reference to the place (or website) of availability of metadata of All India IIP should be included in the Press Note on IIP. Contact details of relevant statisticians who can answer various questions by users be included in the Press Note of the All India IIP.

(Paragraph 2.88)

13. **Data revisions**: Detailed documentation of revisions carried out in the quick and first revision indices of industrial production, explaining the sources and reasons of revisions, should be done and made available to the users by the CSO. It should improve the transparency of the All India IIP by giving the

response rates in the monthly Press Note of the All India IIP. Breaks in series should be explained when consistent series cannot be constructed. The CSO should hold meetings with users of the All India IIP at least twice in a year and benefit from their feedback so as to improve the credibility and public trust of the index.

(Paragraphs 2.91 & 2.92)

14. Strengthening manpower resources for the All India IIP work at the CSO: A separate assessment may be made by the CSO to estimate the manpower and financial resources required for mounting a monthly sample survey to collect directly from the units industrial production data for use in the compilation of the All India IIP and these Resources should be provided.

For handling the regular work of the All India IIP making use of the monthly production survey data and bringing about the recommended improvements in the index, the following staff composition is recommended at the CSO:

Deputy Director General	1
Director/Joint Director	1
Deputy Director	1
Assistant Director	2
SHO/Investigator/DEO	30

(Paragraph 2.93)

15. Framework for Future Statistical Audits: In the introductory chapter of this report, the question: "What is Statistical Audit?" has been addressed in paragraphs 1.8 and 1.9 and the country experiences on statistical audit have been reviewed in respect of five countries: Sweden, United Kingdom (UK), Portugal, Canada and Netherlands in paragraphs 1.17 to 1.39. On careful consideration of the country experiences in the context of the salient features of the decentralized Indian Statistical System, it is recommended that the UK Model is the most appropriate guide for instituting a system of statistical audits in India under the mandate of the National Statistical Commission. The salient features of the UK Model have been elaborated in paragraphs 1.18 to 1.27 along with relevant reference documents and the web sites at which these documents can be accessed.

(Paragraph 3.2)

It is recommended that India should start thinking on the development of its own National Quality Assurance Framework, benefiting from its participation in the current deliberations of UN Statistical Commission and the outcome of the efforts of the United Nations Expert Group on National Quality Assurance Frameworks and making use of the mandate of the National Statistical Commission. Such a National Quality Assurance Framework, if and when

developed by India, will provide the umbrella to the NSC for conducting statistical audit over the statistical activities to ensure quality and integrity of the statistical products.

(Paragraph 3.3)

16. Manpower Resources for Statistical Audit Function: It is recommended that:

- An external statistical audit team leader should be selected for a specific audit on short –term contract from outside the Government to ensure impartial and independent audit report;
- The external audit team leader should be supported by a high ranking officer (an Additional Director General level experienced statistician) appointed by the NSC in the NSC Secretariat as Head of Statistical Audit Division on a statutory basis for a period of five years, who will report directly to the Chairman of the NSC;
- One Deputy Director General, one Director/Joint Director, two Deputy Directors and appropriate technical and administrative support staff should assist the Head of Statistical Audit Division.

(Paragraph 3.4)

Metadata for India's IIP (Base: 1993-94) placed on the DSSB of IMF

The Data: Coverage, Periodicity, and Timeliness	
Coverage characteristics	**5.1.1 Statistical presentation** Data are disseminated on the Index of Industrial Production (IIP), a Laspeyres index (1993-94 = 100) which measures changes in the volume of production in the mining, manufacturing and electricity sectors. The data are not seasonally adjusted. **Notes:**
Periodicity	**4.1.1 Periodicity** Monthly **Notes:**
Timeliness	**4.1.2 Timeliness** Within six weeks after the end of the reference month. **Notes:**
Access by the Public	
Advance dissemination of release calendar	**5.1.3 Advance release calendar** An advance release calendar which gives one-quarter-ahead notice of the precise release dates is disseminated on the Internet on the IMF's Data Dissemination Bulletin Board (DSBB). A regular notice to this effect is published in the *Press Note on Quick Estimates of the Index of Industrial Production and Use-based Index (Base 1993-94 = 100)*. **Flexibility Notes:**
Simultaneous release to all interested parties	**5.1.4 Simultaneous release** The data are released simultaneously to all interested parties by the Ministry of

	Statistics and Programme Implementation by issuing the press release *Press Note on Quick Estimates of the Index of Industrial Production and Use-based Index (Base 1993-94 = 100)*. The data are subsequently posted on the following Ministry of Statistics and Programme Implementation website.

Integrity	
Dissemination of terms and conditions under which official statistics are produced, including those relating to the confidentiality of individually identifiable information	**0.1.1 Responsibility for collecting, processing, and disseminating statistics** **Ministry of Statistics and Programme Implementation** The statistical system is decentralized, with the respective ministries having responsibility for the statistics on the subjects under their charge. **Production index** In accordance with the *Government of India (Allocation of Business) Rules*, 1961, as amended from time to time, it is the responsibility of the Ministry of Statistics and Programme Implementation to compile and release the Index of Industrial Production data. **0.1.2 Data sharing and coordination among data producing agencies** **Ministry of Statistics and Programme Implementation** The methodology of compilation is the responsibility of the Ministry of Labour and Ministry of Statistics and Programme Implementation, respectively. **Production index** There exists a mechanism of data sharing between Ministry of Statistics & Programme Implementation and the Ministry of Commerce and Industry. **0.1.3 Confidentiality of individual**

reporters' data

Ministry of Statistics and Programme Implementation

Confidentiality of individual responses is maintained.

Production index

The confidentiality of individual respondents' data is maintained through National Data Dissemination Policy approved by Union Government of India. The index series are published on a level of aggregation that prevents direct or indirect disclosure of individual data. Individual/unit level data are provided to the users on request after suppressing the identification particulars.

0.1.4 Ensuring statistical reporting

There is no formal legal authority to obtain requested data from respondents.

0.2.1 Staff, facilities, computing resources, and financing

The number of the staff is adequate to perform the required tasks. Senior as well as junior staff is knowledgeable about the concepts and methods of index calculation. There is high awareness of the need to ensure as far as possible consistency between the concept and purpose of the index and the methods applied. Also considerable efforts are devoted to ensure a robust production process in order to ensure the collection, compilation and publication of the index on a timely basis.

Further, sufficient computer resources and financial resources for compiling the statistical series have been allocated for performing the required tasks.

0.2.2 Ensuring efficient use of resources

Rules of data validation as well as index compilation procedures and data file formats are harmonized so that the reporting of production, validation of the data and compilation of indices can be undertaken efficiently and timely.

	0.3.1 Monitoring user requirements
	New or emerging data requirements as well as methodological issues are deliberated and decisions taken by the Standing Committee on Industrial Statistics (SICS) during the process of revision of base year. Users are also welcome to raise questions and to give suggestions to the Ministry.
	0.4.1 Quality policy
	Officers and staff are carefully instructed to comply strictly with all rules regarding integrity and confidentiality to prevent any influence from other parties. Consistency in concepts as well as in published data are also an issue of high priority as even very small discrepancies or ambiguities in the published indexes may have considerable effect as many policy decisions are based on the index. Staff are, therefore, trained and instructed to follow rules and procedures in the compilation of the index to ensure the quality.
	0.4.2 Quality monitoring
	Measures are in place to monitor the quality of the various statistical stages. The processing of data is carefully checked each month according to a fixed schedule for checking and validation of data, both manually and automatically. Before publication the final index figures are doubly checked to prevent mistakes.
	0.4.3 Quality planning
	In order to improve the quality of production data, the Ministry is having regular interactions with the source agencies to improve their system of data collection and estimation procedures.
	1.1.1 Impartiality of statistics
	Ministry of Statistics and Programme Implementation
	The Ministers in charge of the respective departments are the final authority for all statistical policies. Under the terms of the Indian Constitution, the Ministers are

	responsible to the Parliament. **Production index** The *Government of India (Allocation of Business) Rules*, 1961 address the general need for the professional independence of the data producing agency and prohibits interference from others, including other government agencies, in the compilation and/or dissemination of the Index of Industrial Production. There is thus a long standing tradition of non-interference and impartiality. **1.1.2 Selection of sources, methodology, and modes of dissemination** The choice of source data and statistical techniques for sampling, processing and validation is based solely on statistical considerations. A methodological document for the respective series is available on Ministry's website. **1.1.3 Commenting on erroneous interpretation and misuse of statistics** Efforts to prevent misinterpretation or misuse of statistics are made by providing explanatory materials and documentation. **1.2.1 Disclosure of terms and conditions for statistical collection, processing, and dissemination** <u>**Ministry of Statistics and Programme Implementation**</u> The *Government of India (Allocation of Business) Rules* are published in Hindi and English and are available, for a fee, from book stores selling government publications or from: Controller of Publications, Civil Lines, Delhi - 110006, India. Phone: 91 11 2396 7689. Fax: 91 11 2396 7846. <u>**Production index**</u> The terms and conditions under which the

	index is compiled and disseminated, are publicly available in homepage of Ministry of Statistics and Programme Implementation. **1.3.1 Guidelines for staff behavior** Guidelines for staff behavior are outlined in the Civil Services Conduct Rules, which are implemented and followed in the daily work in the data producing agencies and in the contact with users and respondents.
Identification of internal government access to data before release	**1.2.2 Internal governmental access to statistics prior to release** **Ministry of Statistics and Programme Implementation** The data are made available to various government offices and to the public at the same time. There is no internal government access to the data prior to their release to the public. **Production index** The Index is released at the same time to all users. No parties, including other government agencies, are supplied with data in advance of the official release.
Identification of ministerial commentary on the occasion of statistical releases	**1.2.3 Attribution of statistical products** **Ministry of Statistics and Programme Implementation** There is no ministerial commentary accompanying the release of the data. **Production index** Data released to the public are clearly identified as the product of Ministry of Statistics & Programme Implementation. Attribution to the agency as such is not explicitly requested.
Provision of information about revision and advance notice of major changes in methodology	**4.3.1 Revision schedule** The data are provisional when first released. The Quick Release index for a reference month is revised twice: (1) at the time the Quick Release index for the next month is released; and (2) in the third month following the reference month. At that time the data become final.

	4.3.2 Identification of preliminary and/or revised data The press release indicates that the data are subject to revision. **1.2.4 Advance notice of major changes in methodology, source data, and statistical techniques.** Major changes in methodology are made only at the time of revision of the base year. The public are informed at the time of the change through a Press Release.
Quality	
Dissemination of documentation on methodology and sources used in preparing statistics	**5.2.1 Dissemination of documentation on concepts, scope, classifications, basis of recording, data sources, and statistical techniques** Documentation on the methodology and data sources used in the compilation of the Index of Industrial Production is available from the contact person **or at** http://mospi.nic.in/iip_intro.htm . The documentation is updated at the time the series is revised.
Dissemination of component detail, reconciliations with related data, and statistical frameworks that support statistical cross-checks and provide assurance of reasonableness	**4.2.2 Temporal consistency** The Ministry of Statistics and Programme Implementation website http://mospi.nic.in/iip_report.htm disseminates the following time series data: (1) monthly data for the current and previous year for the main index and for the three sector sub-indices (mining, manufacturing, and electricity); (2) monthly data for the current and previous 12 months for sub-indices at the 2-digit level of the National Industrial Classification (NIC) 1987; (3) monthly data for the current and previous 12 months for use-based indices (basic goods, capital goods, intermediate goods, consumer durable goods, and consumer non-durable goods); and (4) annual data for the previous five years for sub-indices at the 2-digit level of the NIC,

	1987.
	4.2.3 Intersectoral and cross-domain consistency
	Consistency with Other Indicators of Industrial Production: Index of Industrial Production is only a short term indicator, used till the detailed results of Annual Survey of Industries are available. For the current period, the series is more or less consistent with other indicators available on industrial production at the all-India level.

Notes:

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Summary of Methodology

I. Analytical Framework, Concepts, Definitions, and Classifications

2.1.1 Concepts and definitions

Concept: Index of Industrial Production (IIP) is an abstract number, the magnitude of which represents the status of production of different items individually and collectively as a group for a given period of time. The inputs and technology used in the production of items under reference may or may not be the same. Strictly speaking, the IIP is a short-term indicator of industrial growth for the organized sector till the results from the Annual Survey of Industries (ASI) become available. This indicator is of paramount importance to the Government for planning purposes and is also being extensively used by various organizations, including Industry, Research, and Academic Institutions.

Definition: The Index of Industrial Production is a quantitative index, the production of the items being expressed in physical terms. The Index is compiled by taking into account the quantities of items produced during the current month, vis-à-vis, the average monthly production in the base year. Selection of items is based on the total production of the items as the Primary (Main) Product as well as Secondary (By) Product.

2.3.1 Classification/sectorization

Classification: The current series of IIP (base 1993-94) follows the National Industrial Classification 1987 (NIC-1987) which is based on ISIC – Rev 2 published by UNSD.

II. Scope of the data

2.2.1 Scope
Scope of the data

Industrial Coverage: The index covers 538 items, classified into 283 item groups under three sectors i.e. Mining (64 items), Manufacturing (473 items) and Electricity (1 item) with weights of 10.47%, 79.36% and 10.17% respectively. The Mining sector covers 64 items under different headings viz. Fuel Minerals, Metallic Minerals, Non-Metallic Minerals, and Minor Minerals. This sector also includes Petroleum and Natural Gas, Coal & Lignite. The Manufacturing sector covers 473 items under different groups e.g. Food, Textiles, and Chemicals etc. The Electricity Sector is treated as a single item. All the factories included in the frames maintained by the source agencies are covered for compilation of IIP.

Product Coverage: Within an industry the products are covered on the basis of the concepts of Primary (Main) Product as well as Secondary (By) Product. The items have been selected on the criteria that each item should generally account for at least Indian Rs. 800 million of Gross Value of Output at the item level and Indian Rs. 200 million of Gross Value Added at the ultimate digit level of NIC-87. The criteria has been relaxed, in some 2-digit groups of NIC-87, to ensure that the provisionally selected items in all the 2-digited industry groups captured at least 60% of the value of output of the particular group. The over-riding criteria for finalization of item-basket have been the regular flow of monthly production data from the source agencies/collection authorities. All the 18 items of small-scale sector included in the 1980-81 series of IIP were accounted for in the revised series with base 1993-94.

III. Accounting Conventions

- None

IV. Nature of the Basic Data Sources

3.1.1 Source data collection programs

The data for compilation of IIP is furnished by 15 data source agencies located in various Central Ministries/Departments/Subordinate Offices of the Government of India, which, in turn, collect data from their primary sources (factories) within four weeks from the reference month.

Sources of Weights: The source used for the aggregation of weights is the results of Annual Survey of Industries for the base year (1993-94) for the current series of IIP.

The Annual Survey of Industries (ASI) is conducted by the Ministry of

Statistics & Programme Implementation every year for the organized manufacturing sector throughout the country except the States of Arunachal Pradesh, Mizoram and Sikkim and Union Territory of Lakshadweep. The ASI covers following industries:

- All the factories and industrial units registered under Sections 2m(i) and 2m(ii) of the Factories Act, 1948, employing 10 or more workers using power and 20 or more workers but not using power on any day of the preceding 12 months;
- Bidi and Cigar Manufacturing Establishments registered under the Bidi and Cigar Workers (Conditions of Employment) Act, 1966 employing 10 or more workers using power and employing 20 or more workers but not using power on any day of the preceding 12 months;
- Certain services and activities like Cold Storage, Water Supply, Repair Of Motor Vehicles and Other Consumer Durables like watches, etc.

Item Selection: The items have been selected on the criteria that each item should generally account for at least Indian Rs. 800 million of Gross Value of Output at the item level and Indian Rs. 200 million of Gross Value Added at the ultimate digit level of NIC. The criteria has been relaxed in some groups to ensure that the provisionally selected items in all the 2-digited industry groups captured at least 60% of the Value of Output of the particular group. The over-riding criteria for finalisation of item-basket has been the regular flow of monthly production data from the source agencies/collection authorities.

Unit Selection: Frame for coverage of units is decided by the source agencies, which collect data from the factories. For compilation of IIP both large and medium factories are covered for collection of data by the source agencies. Sample Size: The sample size for data collection is decided by the source agencies. Generally, efforts are made to cover all the units.

Data Collection Methods: The manufacturing sector's data for compilation of IIP is supplied regularly on monthly basis by 13 source agencies located in various Ministries/Departments/Subordinate Offices of the Government of India. For Mining Sector the index is compiled by the Indian Bureau of Mines (IBM), Ministry of Mines. IBM collects data in respect of metallic and non-metallic minerals from about 3000 mines. For the Electricity Sector, the monthly production data are collected from 252 units by the Central Electricity Authority, Ministry of Power. These organisations, collect the data through mail questionnaires, using paper forms at the level of individual establishments. Only item-wise total production of all the units not the production of individual items is reported by the source agencies to CSO for

compilation of IIP.

Item/Production Specification: Specification of the item is not taken into account in collection of production data by the source agencies.

3.1.2 Source data definitions, scope, classifications, valuation, and time of recording

Nature of Indicators Used: The basic data used for compilation of the index is the production in terms of quantity. However, there are certain items such as Machinery, Machine Tools, Ship Building etc. on which the production data is furnished in value terms. In order to remove the effect of price rise from the index, the production figures of such items are deflated on the basis of Wholesale Price Indices (Base 1993-94) before compilation of index.

V. Compilation Practices

3.3.1 Source data statistical techniques

Procedures for Non-Response: In India, the Index of Industrial Production is based on the responded production as well as estimated production for non-responding units. The production estimates for the non-responded units are developed by repetition of last available data, taking the average production data for the last few months or taking into consideration the installed capacity etc. The appropriate estimation procedure is decided by the source agencies themselves.

Treatment of Missing Prices: Replacement of items is not done.

Selection of Replacement Items: The index is compiled on the basis of the data on a fixed number of items collected from the source agencies which in turn collect the data from different factories and estimate the data on their own, as per the requirements.

Introducing New Units and Products: New units/new products are included only at the time of the revision of base year.

3.3.2 Other statistical procedures

The production figures, if not reported by all the units in the current month due to any reason, are estimated for the current month and revised subsequently in the next month, and finally in the third month on the basis of which the final indices for a month are calculated.

Nature of Weights: The weights for the three sectors (mining, manufacturing, and electricity) are based on gross value added in the base year. The overall weight of the manufacturing sector is apportioned to the industry groups at the 2-digit, 3-digit- and 4-digit level of the National Industrial Classification (NIC) 1987, on the basis of the gross value added. The weighting diagram for the IIP is prepared on the basis of Gross Value Added for the year 1993-94 up to the ultimate digit of NIC both for organized (based on the results of ASI) and unorganized manufacturing sectors (based on the follow up surveys of Economic Census). Further distribution of ultimate digit level weights to items has been done on the basis of Gross Value of Output. The weights of selected items within an industry group are apportioned on the basis of the value of

output.
Period of Current Index Weights: The current index weights are based on the value of production of the industries during the base year period viz. April, 1993 to March 1994 as reported in the Annual Survey of Industries. The same weights are used until the revision of the base year is done.

Frequency of Weight Updates: The weights are revised with every revision of the base year. The base year revision would now be done usually once in every five years as per UNSD's recommendations (the previous base years of the index were 1980-81, 1970, 1956, 1951 and 1946).

- Computation of lowest level indices: The lowest level index prepared is the item-wise index, which is compiled as the ratio of production quantity in the current month with respect to its average monthly production quantity in the base year.
- Aggregation: The IIP is calculated using the Laspeyres formula as a weighted arithmetic average of production relatives. The index is primarily quantity based, although for some items the quantity relatives are obtained by price deflation.

The index at group level/2-digit level of NIC is compiled by using the Laspeyer's formula, i.e.,

$$I = SUM (W_iR_i)/ SUM (W_i)$$

where R_i is the production relative and W_i is the weight of an item. The index is prepared for each two-digit level of NIC. Also the index is prepared on the basis of the use-based classifications e.g. Basic Goods, Intermediate Goods, Capital Goods, Durable Consumer Goods and Non-Durable Consumer Goods.

- Alignment of Value of Weights and Base Period: No alignment of the weights is required as the weights as well as the base year production relate to the same reference period viz. April, 1993 to March 1994.
- Linking of Re-weighted Index to Historical Index: Whenever there is change in the base year, the new series can be linked with the old series by preparing linked series. For the common period, the index series are available with both, old weights & new weights for linking the two series.
- Reference Period: The reference period for the current index of industrial production in India is 1993-94, when the index=100.
- Seasonally Adjusted Indices: Not being done at present.

3.4.2 Assessment of intermediate data

Verification of Data: Before releasing the index, the accuracy of the production data wherever significant deviation from the last months production is observed, is confirmed from the source agencies and corrections required are incorporated.

Verification of Processing: The index is prepared every month through a built-in software specially made for this purpose.

VI. Other Aspects

- None

Notes:

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Report of Advisory Panel on Transparency Standards (of CFSA)
Assessment of Data Dissemination Standards

4.1.2 Production Index (All India IIP, Base: 1993-94)

4.1.2 (a) Coverage, Periodicity & Timeliness

The SDDS Guide prescribes a production index to track GDP on a timely basis. The expected periodicity is monthly and the timeliness is 'within six weeks' while timeliness of 'within one month' is encouraged. For a country with a large industrial base, this would imply the use of the IIP.

India conforms to the requirements of coverage, periodicity and timeliness in the SDDS in providing the monthly IIP with the expected periodicity and timeliness. However, it excludes construction, gas and water supply which are usually included as per the recommendations of the United Nations Statistical Office. Given the growing importance of construction, it would be useful to extend the scope of the IIP to include the construction sector as well as water and gas supplies.

4.1.2 (b) Pre-requisites of Quality

Legal & Institutional Environment: The CSO is the nodal agency for the compilation of the IIP. It compiles the IIP from the data supplied to it by fifteen sources. The largest source of data is the Department of Industrial Policy and Promotion (DIPP), which accounts for over half the items included in the index and more than half of the weight. Mining data are provided by the Bureau of Mines, Nagpur and data on the electricity sector is provided by the Central Electricity Authority. The Textile Commissioner provides data on textiles.

The DIPP sources the data directly from the production units or indirectly, from industry associations. The Factories Act provides the Department with the legal authority to demand production statistics. Thus, the legal environment is quite robust. Since the removal of the industrial licensing regime in the early 1990s, compulsion does not exist for firms to submit comprehensive data on a range of indicators essential to industrial statistics, which they were required to do earlier. The data submission is largely voluntary and in the process has weakened considerably. It is recommended that the existing arrangements be strengthened and a consolidation of the source agencies that provide the source data be implemented. Further, in the

process of consolidation of the source agencies, the CSO should reduce its reliance on the administrative machinery and industry associations and strengthen its own direct capabilities.

Resources: Resources available to the CSO to compile the IIP from the available source data are considered to be adequate. The CSO's staff, facilities and finances are commensurate with its programs. However, since the data-source agencies are many and diverse, the resource availability at these is not ascertained. There is no formal effort to ensure the efficiency of the use of resources at any level.

Relevance: The IIP is relevant to a large cross-section of users. However, the CSO does not have any formal process to monitor the practical application of its statistics. It is recommended that CSO conducts a survey of users of IIP at least once in three years.

Other Quality Management: There is no formal process for a regular quality check or a periodic quantification of the quality of the data used in the generation of the IIP.

4.1.2 (c) Assurances of Integrity

Professionalism: The CSO has professional independence. It engages professionals through competitive evaluation. The IIP is produced on an objective basis. Choices of sources and statistical techniques are taken largely on statistical consideration. However, the source agencies are selected largely on the basis of administrative convenience.

Transparency: The CSO's statistical policies and practices in respect of the generation of the IIP are transparent. However, the CSO can improve the transparency of the IIP if it also reveals the size (number) of units in the frame, the sample size and the monthly response rate for each item of the IIP. The CSO does not give any advance notice of major changes in methodology or source data.

Ethical Standards: . CSO staff is bound to act in accordance with the Civil Services Conduct Rules. Other guidelines for staff behaviour are found in the Official Secrets Act, 1932 and Prevention of Corruption Act, 1998.

4.1.2 (d) Methodological Soundness

Concepts & Definitions: The generation of the IIP is based on accepted norms of concepts and definitions.

Scope: The scope of the IIP is broadly in line with international practices and it does conform to the prescriptions of the SDDS. However, it would be useful if the scope of the IIP was expanded to include the construction and water and gas sectors. This is recommended by the United Nations Statistical Office and is the practice in a number of developed economies.

Classification/Sectorisation: The classification system is largely in line with the internationally-accepted practices.

Basis for Recording: Save a few exceptions, data are recorded in volume terms as is the internationally-accepted practice.

4.1.2 (e) Accuracy & Reliability

Source Data: The IIP is based on data obtained from fifteen different source agencies. The ability of some of these sources to collect comprehensive data deteriorated somewhat since the onset of reforms. Responses are known to have deteriorated both in terms of units responding and in terms of timeliness of the response. In recent times, efforts have been made to improve the response rate and the timeliness in some cases. The published IIP data, however, continue to exhibit a lack of adequacy of the responses. It is unlikely that this inadequate response rate would significantly affect the reliability of the growth rates reflected by the IIP. Nevertheless, it is recommended that in the interest of better practices, the data collection machinery be improved substantially. It is important that the CSO be less handicapped than it seems today with respect to the availability of data and the quality of the data available to it. It is recommended that the CSO should make the frame, select the sample and collect the data directly from the sample units, for which it will require additional resources.

The source data and therefore, the IIP, however, have been slow in reflecting the changing face of India's industrial sector. The IIP needs to adjust its basket of commodities and the weights assigned to these quicker than it does currently. To improve the methodology in compilation of IIP data, a move towards a chain-linked index instead of a base-linked index is recommended.

Assessment of Source Data: The CSO does not assess the source data.

Statistical Techniques: The statistical techniques deployed by the CSO are adequate and they conform to internationally accepted practices.

Assessment and Validation of Intermediate Data and Statistical Output: The expectation here is that the intermediate data generated using

the source data are validated against alternate information and statistical discrepancies are assessed and investigated. The CSO does assess and validate the intermediate data on an on-going basis.

Revision Studies: The CSO studies revisions in the estimates made by it and it does trace these to the source data. However, such analysis may not feed into its statistical processes because the CSO does not unilaterally adjust the data provided by the source. It seeks to influence the data provider to make adjustments in its data rather than make the adjustments itself.

4.1.2 (f) Serviceability

Periodicity & Timeliness: Both periodicity and timeliness meet the SDDS requirements. As prescribed, the IIP is released with a periodicity that is monthly and timeliness is 'within six weeks'.

Consistency: Statistics are consistent with the data sets and over time.

Revision Policy & Practice: The CSO follows a well-defined system of providing provisional and revised estimates. These are clearly identified. However, often the revisions are so large as to warrant an explanation of the causes of these revisions. These revisions are almost entirely because of the improved response rates obtained by the source agencies that provide the underlying data. The publication of the response rate with each release would enable the users to anticipate changes in the estimates and appreciate the revisions when they occur.

4.1.2 (g) Accessibility

Data Accessibility: The data are presented in a clear and user-friendly manner. It is made available through the website simultaneously to all users. Statistics are made available according to a pre-announced schedule.

Metadata Accessibility: Notes on concepts and methodologies are made available through the official website.

Assistance to Users: The CSO provides reasonable assistance to users.

A summary of recommendations for the Panel is given below.

Production Index (Summary of Recommendations of the Panel)

- With liberalisation, the institutional data collection machinery has

suffered. Implementation of the existing arrangements for compilation of the IIP should be strengthened and the agencies that provide the source data should be consolidated. The CSO should assume a direct responsibility in the generation of the IIP. It should create the frame, select the sample and collect the data directly from the units, for which it will require additional resources. Its reliance on the administrative machinery and on industry associations should be reduced.

- The CSO's statistical policies and practices in respect of the generation of the IIP are transparent. However, the CSO can improve the transparency of the IIP if it also reveals the size (number) of units in the frame, the sample size and the monthly response rate for each item of the IIP.

- The IIP excludes construction, gas and water supply. Their inclusion in the IIP is recommended by the United Nations Statistical Office. It would be useful if the scope of the IIP was expanded to include the construction, water supply and gas sectors.

- The IIP is based on data obtained from fifteen different source agencies. The ability of some of these sources to collect comprehensive data has deteriorated since the onset of reforms. In the interest of better practices, the data collection machinery needs to be improved substantially, particularly since the availability and quality of data has improved substantially.

- The source data does not fully capture the changes in India's industrial sector. The IIP needs to adjust its basket of commodities and the weights assigned to these quicker than it does currently.

- The revisions in IIP data are substantive enough to warrant an explanation of the causes of these revisions. These revisions are almost entirely because of the improved response rates obtained by the source agencies that provide the underlying data. The publication of the response rate with each release would enable the users to anticipate changes in the estimates and appreciate the revisions when they occur.

- The CSO does not have any formal process to monitor the practical application of its statistics. It is recommended that the CSO conducts a survey of users of the IIP at least once in three years.

- To improve the methodology in compilation of IIP data, a move towards a chain-linked index instead of a base-linked index is recommended

Committee on Financial Sector Assessment (CFSA) March 2009(Report)
GOVERNMENT OF INDIA (Ministry of Finance)& RESERVE BANK OF INDIA

Summary on All India IIP (Base: 1993-94)

As in the case of national accounts, with liberalisation (de-licensing in particular) the institutional data collection machinery has suffered in the compilation of IIP. CSO should assume direct responsibility for the generation of IIP. It should create the frame, select the sample and collect the data directly from the units. In the process of consolidation of the source agencies, CSO should reduce its reliance on the administrative machinery and industry associations and strengthen its own direct capabilities. The CSO can further improve the transparency of the IIP if it also reveals the size (number) of units in the frame, the sample size and the monthly response rate for each item of the IIP. The IIP needs to adjust its basket of commodities and the weights assigned to these quicker than it currently does. The IIP excludes construction, gas and water supply but the United Nations Statistical Office recommends their inclusion; it would be useful if the scope of the IIP were expanded to include construction, water supply and gas sectors. The publication of the response rate with each release would also enable users to anticipate changes in the estimates and appreciate the revisions when they occur.

While CFSA appreciates the merits in moving towards a chain-linked index instead of a base-linked index in the compilation of IIP and price indices, given the fast-changing commodity sector profile due to modernisation and new technology, the full implications of the change in terms of coverage, consistency and continuity in time-series must be examined by the Government before implementation.

Text and Recommendations of CFSA Report

The CSO is also the nodal agency for compilation of the Index of IIP. It compiles the data supplied by a multitude of sources, the largest source being the Department of Industrial Policy and Promotion (DIPP), which accounts for over half of the items included in the index and more than half of the weight. As in the case of national accounts, with liberalisation (de-licensing in particular), the institutional data collection machinery has suffered. For example, since the removal of the industrial licensing regime in the early 1990s, there is no longer any compulsion for firms to submit comprehensive data on a range of indicators essential to industrial statistics. The data submission is largely voluntary and, in the process, has weakened considerably.

The Panel has recommended strengthening the implementation of the existing arrangements and consolidating the source agencies that provide the source data. The CSO should assume direct responsibility in generating the IIP. It should create the frame, select the sample and collect the data directly from the units. Its reliance on the administrative machinery and on industry associations should be reduced. Further, when consolidating the source agencies, the CSO should reduce its reliance on the administrative machinery and industry associations, and strengthen its own direct capabilities. The CSO can further improve the transparency of the IIP if it reveals the size (number) of units in the frame, the sample size and the monthly response rate for each item of the IIP.

The IIP needs to adjust its basket of commodities and the weights assigned to these more rapidly than it currently does. The IIP currently excludes construction, gas and water supply, but the United Nations Statistical Office recommends their inclusion in the IIP. It would be useful if the scope of the IIP was expanded to include these sectors. The publication of the response rate with each release would also enable users to anticipate changes in the estimates and appreciate the revisions when they occur. The CFSA supports these recommendations.

The Panel has made a far-reaching recommendation to improve the methodology in compiling IIP data, i.e., a move towards a chain-linked index instead of a base-linked index. While the CFSA appreciates the merit in this view, given the fast-changing commodity sector profile due to modernisation and new technology, the full implications of such a change in terms of coverage, consistency and continuity in time-series must be examined by the Government before implementation.

National Statistical Commission (2001)
Review of IIP All-India Index of Industrial Production

Introduction

5.4.1   The Central Statistical Organisation (CSO) is responsible for the compilation and publication of the Index of Industrial Production (IIP) since 1950. The IIP is compiled as a simple weighted arithmetic mean of production relatives by using Laspeyre's formula. The IIP is a quantum index, the production of items being expressed in physical terms. However, the unit of reporting in respect of certain items like machinery, machine tools, ship building, etc. is in value terms. The monthly figure of production value in such cases is first deflated by the Wholesale Price Index (WPI) of the corresponding categories, released by the Office of the Economic Adviser, Ministry of Industry. The scope of the IIP as recommended by the United Nations Statistical Office (UNSO) includes mining, manufacturing, construction, electricity, gas and water supply. But due to constraints of data availability, the IIP compiled in India has excluded construction, gas and water supply sectors.

Current Status of IIP (Base 1993-94)

5.4.2   The Commission discussed the following aspects of the IIP in detail:

        A.   Base Year
        B.   Scope
        C.   Coverage of items
        D.   Weighting diagram
        E.   Sources of data
        F.   Quick Estimates and Revisions

A.   Base Year

5.4.3 As the structure of the Industrial Sector changes over time, it is necessary to revise the base period and the weighting diagram of the IIP periodically so as to measure the real growth in the industrial sector. The CSO made such periodical revisions by reviewing the coverage of items and industries and by improving, as far as practicable, the technique used in the construction of IIP and by shifting the base to a recent period. When the compilation of the index commenced in India, the base year adopted was 1946, and this was revised successively to 1951, 1956, 1960, 1970, 1980-81 and 1993-94. The base year, number of items, month of release, number of

2-digit industry groups and the period for which the indices were compiled are given in Annexe 5.19 (not enclosed in this report).

5.4.4   The United Nations has recommended that the base period of the index number should be revised quinquennially. The practice of revising the index five-yearly was followed till 1960. Thereafter, two revisions were made after a gap of about ten years each. The last revision of the base period (1980-81) was made after a lapse of 13 years. For the purpose of revising the IIP, the CSO generally constituted expert groups or committees to make suitable recommendations with regard to choice of the base year and necessary modifications in the weighting diagram. The revision of the 1980-81 series of the IIP was guided by a Technical Advisory Committee (TAC) constituted by the CSO in June 1995 to advise on the Compilation of Comparable State IIPs, the corresponding Composite All-India IIP and All-India IIP. The TAC submitted its report in June 1998. The main recommendations of the Committee along with their present status are set out in Annexe 5.20 (not enclosed in this report).

B.   Scope

5.4.5 The scope of the index has been confined to the mining, manufacturing and electricity sectors, and does not cover gas, water supply and construction. The number of items included in the IIP with 1980-81 and 1993-94 as base years is given in Table 5.1.

Table 5.1: Sector-wise number of items in 1980-81 and 1993-94 series

Sector	No. of Items	
	1980-81	1993-94
Mining and Quarrying	61	64
Manufacturing	290	478
Electricity	1	1
Total	352	543*

Note: *clubbed into 287 item groups: Mining-1, Manufacturing -285 and Electricity-1.

C.   Coverage of Items

5.4.6 In the revised IIP, the approach adopted for selection of items for inclusion in the item basket is as follows:

(a) Each item should generally account for at least Rs. 80 crore of gross value of output at the item level and Rs. 20 crore of gross value added at the ultimate (4-digit) level of NIC 1987. The criteria have, however, been applied

with flexibility in the case of industry groups which were not represented by a sufficient number of items;

(b) In order to improve the representativeness of the item basket at the 2-digit level of NIC, some of the important items of the IIP series with base 1980-81 were also included.

5.4.7   The item basket so identified captured about 80 per cent of the output of the manufacturing sector. It was finalised after extensive discussions with source agencies for production data especially the Department of Industrial Policy and Promotion (DIPP), Textile Commissioner, Directorate of Vanaspati and Development Commissioner for Iron & Steel (DCI&S), keeping in view the distinctive character of the items and the availability of a regular flow of monthly production data. Also, to capture at least 60 per cent of the output at the 2-digit level for improving the representativeness of the items, the criterion for item selection was relaxed and some additional items of 1980-81 series were included in the basket.

5.4.8 In this section of the Report, the unregistered manufacturing sector is defined as those units which are not registered under the Factories Act, 1948. On account of non-availability of regular monthly production data, the unregistered sector has been represented by the units belonging to the Small Scale Sector only. Since the Office of the Development Commissioner, Small-Scale Industries (DCSSI), could not provide data on any of the additional items identified for the new series, all the 18 items of the Small Scale Sector included in the 1980-81 series were retained in the revised series.

D.   Weighting Diagram

5.4.9   The weights of the mining, manufacturing and electricity sectors (1-digit level of NIC) have been allocated on the basis of gross value added for 1993-94 as published in the National Accounts Statistics. For the first time, the weighting diagram with base 1993-94 took into account the contribution of the unregistered manufacturing sector along with that of the registered sector. For estimating the 1993-94 gross value added for the unregistered sector, the data from the Follow-up Enterprise Surveys of the Economic Census namely, Directory Manufacturing Establishments (DME), Non-Directory Manufacturing Establishments (NDME) and Own-Account Manufacturing Enterprises (OAME), for the years 1989-90 and 1994-95 have been used. After interpolating the GVA at the 2-digit level for the year 1993-94, further allocation at the 3-digit and 4-digit levels of NIC has been done using the ratios of 1994-95 surveys, it being in close proximity to 1993-94. The total contribution at 2, 3 and 4-digit level of NIC has been arrived at by using registered sector data along with data for the unregistered sector for the

corresponding groups and sub-groups. Further the allocation of weights to the items within the 4-digit industry groups has been done using Value of Output as available from ASI 1993-94.

5.4.10   The recommendation of the TAC on the issue of using Gross Value of Output instead of Gross Value Added as a criterion for allocation of weights for the compilation of the revised series of IIP was referred to a Special Committee.   Following the use of GVA, as recommended by the Special Committee, the distribution of weights at the sectoral level for the IIP series with base year 1993-94 is given in Table 5.2.

Table 5. 2: Comparison of Weights at Sectoral level in 1980-81 and 1993-94 series

NIC Section	Description	Weight	
		1980-81	1993-94
1	Mining and Quarrying	114.64	104.73
2 and 3	Manufacturing	771.07	793.58
	Registered		505.13
	Unregistered		288.45
4	Electricity	114.29	101.69
Total		1000.00	1000.00

E.   Sources of Data

5.4.11   For the 1980-81 series, the CSO used to get monthly production data from as many as eighteen source agencies. The source agencies, in turn, collect data from the production units spread all over the country. For the revised series with base 1993-94, the same set of source agencies has been retained except for Railways, for which the data are now being supplied in a consolidated form by the Railway Board, instead of by four agencies as was done earlier. This has reduced the number of source agencies to fifteen. In terms of the number of items covered, the largest source is the DIPP, which supplies data on as many as 213 out of 285 groups of items in the manufacturing sector, constituting more than 52 per cent in terms of weight of All-India IIP. The index relating to Mining and Quarrying sector is being supplied by the Indian Bureau of Mines, Nagpur, which is combined with manufacturing and electricity indices compiled by the CSO to arrive at the General Index of Industrial Production. The data on the electricity sector is furnished by the Central Electricity Authority. The source-wise number of items proposed by the CSO, finalised after discussion with source agencies, item groups, corresponding weights and the number of units in the frame is given at Annexe 5.21 (not enclosed in this report).

F.   Quick Estimates and Revisions

5.4.12   By the Special Data Dissemination Standards (SDDS) of the IMF, the index for any reference month is to be released within six weeks from the end of that month. In order to achieve this norm for the IIP, all the fifteen source agencies are required to furnish data to the CSO within four to five weeks from the close of month. As all the production units do not furnish data within the stipulated time, the source agencies have to resort to estimation for the non-responding units and thus supply provisional data to the CSO. These provisional data are used for computing the quick index for a given month, which is released by the CSO in six weeks. On the basis of revised production data received later from the source agencies, this index is revised subsequently in the next month and finally, two months thereafter, along with the quick index.

Deficiencies

5.4.13   The current IIP has the following specific problems:

(a)   *Non-response*: The CSO expects to have at least 60 per cent response in terms of production for release of the Quick Estimate and 80 per cent response at the time of final revision of the IIP. The response rate is worked out on the basis of data supplied by the source agencies, which collect the data primarily through mail enquiry method. The response position is quite good for some of the source agencies, but not satisfactory in respect of others, particularly DCSSI, Directorate of Vanaspati and DIPP, which is a major source of data for the IIP. The response rates in terms of weighted item-wise production of responding units for the items on which the data was furnished by DCSSI, Directorate of Vanaspati and DIPP for the months of January, February and March 2000 were in the range of 9 to 16 per cent, 19 to 43 per cent and 37 to 54 per cent, respectively, at the time of quick estimates. The corresponding percentages at the time of final estimates were 56 to 64 per cent, 76 to 83 per cent and 62 to 66 per cent (see Annexe 5.22 [not enclosed in this report]). Annexe 5.23 (not enclosed in this report) indicates distribution of the number of items by percentage of variation in the production reported at the time of quick and final estimates for the three months from January to March 2000. In the case of 73 items, production reported by DIPP varied by five per cent or more, on an average, over the three months. The number of such items were 10, 6, 3 and 2 for DCI&S, DCSSI, Textile Commissioner and Directorate of Vanaspati, respectively.

(b)   *Repetition of Production data*: The total production of an item depends on the number of active units registered with the source agencies for

that specific item. It is quite unlikely that the production of an item, which itself depends on a number of endogenous and exogenous factors, will get repeated from one month to the next and that, too, at the national level. Such repetition of production figures for a particular item exposes the weaknesses in the system of collection of data along with inadequacy of the estimation procedure being used by some source agencies (see Annexe 5.24 [not enclosed in this report]).

(c) *Nil and abnormally high or low Production*: It is also quite unlikely that true production of a particular item at the national level would be 'Nil'. But such data can appear when there are only one or two production units at the national level and they have not reported the production data. Again, it is not uncommon that abnormally high or low production figures are reported for an item compared to the previous months (see Annexe 5.25 [not enclosed in this report]). On account of extreme fluctuations in the production data being reported by the producer to DIPP, the CSO has recently deleted 4 items namely, photosensitised paper, engines, chassis (assembly) for heavy commercial vehicles (bus, truck) and radio receivers from the item basket with effect from April 1998.

(d) *Very few units*: Data on about 45 items reported by the DIPP are based on five or less units (see Annexe 5.26 [not enclosed in this report]). For three items, there is only one production unit in the DIPP frame. Such a situation coupled with non-response may lead to extreme variation in estimates of production, thereby affecting the index value considerably.

(e) *Monitoring of Frame*: Some shortcomings have been noticed in the frame of the units being maintained by the DCSSI, Office of Textile Commissioner, Directorate of Vanaspati and the DIPP. The frame of the units now in use at DIPP for reporting industrial production was earlier maintained by the then Directorate-General of Technical Development (DGTD). This frame covers all industrial establishments within the purview of the Industrial Development and Regulation (IDR) Act. However, it is observed that after liberalisation and the transfer of work to DIPP, the frame has become incomplete in respect of coverage and inclusion of new units. In the pre-liberalisation days, the DGTD was in a position to update the frame on the basis of licenses issued. Now, with de-licensing of certain sectors, the DIPP remains unaware of the setting up of new units in these sectors and can suitably update the frame only when new units inform the DIPP of the commencement of production. Under these circumstances, the frame is very likely to be incomplete. For the same reason, it would continue to include units, which have gone out of existence.

(f) *Inadequate Representation*: The item basket for the All-India IIP with base 1993-94 was selected using detailed results of ASI, 1993-94. The provisional item basket contained 674 items capturing about 80 per cent of the total output of the registered manufacturing sector. The criteria for item selection were relaxed, wherever necessary, to ensure that the provisionally selected items in all the 2-digit industry groups capture at least 60 per cent of the value of output of the particular group. The overriding criterion for finalisation of the item basket was the regular flow of monthly production data from the source agencies. The final item basket contains only 478 items. The 196 items on which data could not be furnished by the source agencies mainly confined to the four agencies: DIPP (80 per cent), Development Commissioner for Iron & Steel (7 per cent), Directorate of Vanaspati (5 per cent) and Office of the Textile Commissioner (4 per cent). The shrinkage in the item basket on account of non-availability of data on nearly 30per cent of the items, contributing about 22 per cent of the total output of the manufacturing sector, has affected the representativeness of the index. While such a compromise has been considered necessary for the feasibility, as one may call it, of the monthly index, there is no denying the fact that the ability of the IIP to measure industrial growth has been severely affected. The problem will persist unless corrective steps are taken by the source agencies.

(g) *Representation of the Unregistered Sector*: While the contribution of the unregistered sector was included in the weighting diagram, this sector was not adequately represented in deriving the production relatives as regular monthly production data remain hard to come by. Only 18 items representing the unregistered sector, which were included in the IIP in the 1980-81 series, continue to be included in the current IIP. Thus, the IIP has failed to adequately represent the unregistered sector in the overall index.

(h) *Weaknesses in the Data Collection Mechanisms of the Source Agencies*: DCSSI, Directorate of Vanaspati, DIPP and the Office of Textile Commissioner do not have an appropriate data collection mechanism. This has resulted in a poor response from the manufacturing units included in their frame for monthly reporting of production data. Most of the source agencies are not geared for collection of data on all items that are being produced by the units within their purview. Ideally, the source agencies need to monitor the performances of all units under their jurisdiction and provide information on the complete set of items identified during the base year revision. But they have not been able to furnish information on most of the new items. Further, it appears that the source agencies do not have an adequate system for validating data before sending the same to the CSO.

5.4.14   The Working Group on Commerce, Industry and the Corporate Sector constituted in the Modernisation of Statistical System in India under the Chairmanship of Dr. Arun Ghosh, after careful consideration of all the issues pertaining to the IIP, felt that it would be useful if, alongside the index of production in the medium and large-scale sector, a separate index for the Small Scale Industrial Sector is computed. The Working Group, therefore, recommended compilation of:

(a)   An alternative IIP based on large manufacturing units (units having 200 or more workers); and
(b)   A separate quarterly index for the Small-Scale Sector.

5.4.15   According to the Working Group, the Index of Production in large and medium industries and the present IIP are to be run in parallel at least for a period of one year or till the revision of the base for the IIP is taken up. The CSO should also solicit the cooperation of the industry associations in the process of data collection and cross-validation. The Working Group was, however, not in favour of publishing two parallel indices, but felt a change-over could be made after one year of experimentation. The index so released should specifically clarify that it mainly pertains to the output of large and medium industries.

Use of Other Administrative Data

5.4.16   The Commission discussed the feasibility of using the Central Excise data for compilation of IIP. Almost all manufacturers are required to file the RT–12 return containing production data within 5 days from the close of a month to the Range Offices of Central Excise.   The RT–12 return is being submitted by more than 100,000 units producing excisable products of which 45 to 50 per cent belong to Small Scale Sector and the remaining are from medium and large factories. At present, about 80 per cent of the RT–12 returns have been computerised and such data are available on the computer system since April 2000. The potential of this vast source of administrative data needs to be examined properly for the compilation of IIP. The feasibility of making use of data from other administrative sources, like sales tax, for compilation of IIP, at least at the State level, should also be explored.

Recommendations

5.4.17   Against the background of the above analysis of deficiencies in the IIP, the Commission makes the following recommendations which are grouped according to the areas of action:

Improvements in the Existing IIP

(i)   The item basket of the Index of Industrial Production (IIP) should be selected in such a way that the indices are representative of the growth in the Industrial Sector at least at the 2-digit level of NIC.

(ii)   The source agencies should make available the data on the additional items to be included in the item basket. The agencies should expand their database to capture new units and new items.

(iii)   To ensure the availability of data on new items, the Central Statistical Organisation (CSO) should regularly provide the source agencies with:

  (a) The list of items that are just below the cut-off criteria of item selection and likely to figure in the revised item basket on the basis of the current series.
  (b) Items identified on the basis of detailed results of Annual Survey of Industries (ASI).

(iv) The source agencies should also identify the important and fast-moving items for inclusion in their database for the purposes of administration and revision of IIP.

(v)   The base year of the Index should be revised quinquennially by the Central Statistical Organisation to adjust to the structural changes in the industrial sector.

Strengthening of Source Agencies

(vi) The statistical set-up in DIPP needs restructuring in terms of statistical manpower and infrastructure, by creating a full-fledged statistical unit under the overall guidance of a professional statistician.

(vii) The proposed statistical unit should be vested with the responsibility of maintenance of the frame, timely supply of monthly production data with an adequate response rate, exploring of suitable methodologies for dealing with non-response and improving the overall quality of data.

(viii)   The statistical set-up of other source agencies of the IIP also needs to be adequately strengthened.

(ix)　Since such strengthening will take some time, the agencies should, in the mean time, attempt to achieve a minimum standard for ensuring the quality and reliability of the Index, by adopting a suitable monitoring mechanism to target a response rate in terms of production of at least 60 per cent in the first month and 80 per cent at the final revision.

(x)　The source agencies should correspond with the production units through fax, e-mail and telephone followed by a personal visit, if necessary, to minimise non-response. Cooperation from the Industrial Associations and State Governments should also be solicited in this context.

(xi)　Source agencies should preferably avoid inclusion of items for which very few units (say, less than 5) are reporting production, in order to avoid extreme fluctuations in the production data due to non-response. If, however, it is necessary to include some such items, the source agencies should make all efforts to closely monitor and collect data for these items.

(xii)　The problem of non-response needs greater and more detailed examination. Therefore, technical experts from the fields of industry and statistics should go into the question of whether statistical methods could be useful for the solution of this problem.

Additional All-India Index of Industrial Production

(xiii)　In view of the difficulties faced in the collection of data for compilation of IIP by the mail enquiry method, the possibilities of constructing an additional Index of Industrial Production by direct collection of monthly production data on selected items from factories with 200 or more workers should be explored. This should first be done for one year on an experimental basis.

(xiv)　For this purpose, the Field Operations Division (FOD) of the National Sample Survey Organisation (NSSO) should be entrusted with the task of collection of monthly production data under the existing legal provisions. The requirement of additional resources for this purpose should be met.

(xv)　Before the above suggestion of compilation of the Index is taken up, a study should be conducted to compare the annual growth rate in production, based on ASI data of recent years (for factories with 200 or more workers) and current IIP. The findings should be examined by

the Standing Committee on Industrial Statistics regarding the workability and adoptability of this approach for compilation of the Additional Index of Industrial Production.\

Use of other administrative data

xvi)   An exploratory study should be undertaken to examine the feasibility of using the production data as available with Central Board of Excise and Customs for compilation of an All-India Index of Industrial Production. The possibility of utilising data from other sources like sales tax for compilation of IIP, at least at the State level, should also be examined.

Written evidence for assessment about statistical product/ output and producer body's practices as a whole (United Kingdom)

WRITTEN EVIDENCE FOR ASSESSMENT – ABOUT OUTPUTS
(Version 1.2, July 2010)

Introduction

This part of the collection of evidence for assessment covers those elements in the Code of Practice[1] that relate to specific outputs or a group of outputs. The evidence collected here complements that provided on behalf of your whole organisation. Please provide evidence about the group of statistics that we have agreed with you is the subject of this assessment.

Where you have consistent practices for each of the outputs in the group, it is sufficient to say so. Otherwise, please give examples of any differences – we only want you to list your practices separately for each output if there are substantive differences between them. Evidence should be sent to **assessment@statistics.gsi.gov.uk**.

Material required

This request has two parts.

The first part asks you to provide a range of existing material about the outputs being assessed. The information required is split into four sections:

1. some contextual information about the outputs;
2. confirmation that you follow your organisation's standard policies when producing these statistics, along with details of any exceptions;
3. links to documents that the Code requires you to publish; and
4. other documents that should be available;

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[1] **http://www.statisticsauthority.gov.uk/assessment/code-of-practice/code-of-practice-for-official-statistics.pdf**

The second part, section 5, relates to additional evidence of Code-compliance. For most assessments, we will ask for written evidence. For those statistics that are considered the least contentious, we will collect this evidence during a meeting with you. We will tell you at the start of the assessment how we propose to collect this information.

Please:
- refer to existing documents, preferably by sending links to information on your website where possible;
- refer to the Code when providing your evidence – we only want to see documentation that is directly relevant to evaluating evidence of compliance with the Code; and
- provide precise references to the relevant points of documentation.

We ask you to indicate whether you consider that you are not fully compliant with any requirements of the Code, and how you are addressing these issues. Please also use this section to flag up any relevant issues that are not explicitly covered elsewhere.

Burden

We want to keep the burden of assessment as low as possible. If you have any queries about this request please contact the Assessment Team. We welcome any feedback on the process.

Confidentiality and Reporting

We don't plan to publish your written evidence, but would make it available on request if asked.

**ASSESSMENT TEAM
(REVISED) JULY 2010**

DECLARATION BY HEAD OF PROFESSION (OR EQUIVALENT)

I confirm that the information contained in this document is accurate, as at the date below.

Name:

Organisation:

Date:

SECTION 1 – CONTEXTUAL DOCUMENTATION

The following set of background information provides a starting point for the assessment. Please provide this information, about the group of statistics being assessed, as early as possible in the assessment process.

Contact information

As part of the assessment process we collect the views of data users, suppliers and other stakeholders. To help with this process, please could you supply the names, email addresses and phone numbers for the following.

- Main people within the statistical production process.
- Data suppliers (or representatives of supplier communities if relevant).
- Internal users (end or interim) of the statistical product, for example policy colleagues.
- Other internal stakeholders (eg Private Office, Press Office).
- External users including user groups, fora, committees etc.
- Other external commentators, including your main media contacts.

For users, please say briefly how you think they use your statistics. For supplier contacts, please say briefly what role each has in the supply chain. For other stakeholders, please describe briefly their role in the statistical production process.

Other background material

- Links to the most recent publication of each of the outputs in this assessment, along with accompanying quality indicators, metadata and other supplementary reports.
- Summary (max. one side of A4) of the history and key characteristics of the statistical product, including any relevant (national or international) legislation or other obligations, and an estimate of the costs to your organisation of producing them.
- A brief summary of the ways in which you seek to achieve good value for the money spent producing these statistics, and seek to demonstrate publicly the nature of that value. In this context, the 'value' of statistical work refers to the benefit delivered by the use of the statistics to influence decisions and actions, now and in the future. Such value could derive from use made by the public, Parliament or others, particularly including those uses which go beyond their original intended use. Include any government

targets (and the rationale behind these targets) that your statistics are used to measure progress against.

This will form the basis of a summary in the assessment report about the statistics, their use and their utility, and will help to demonstrate the relevance and importance of them. The information will also be used, along with other evidence provided in this WEFA, to report explicitly on whether the Assessment team thinks that appropriate information is available, and arrangements in place, to allow your organisation to make considered judgements about value for money; or whether we think that there are aspects of the information or arrangements that need to be enhanced to enable a more considered and convincing case to be made for the value for money offered by this statistical activity.

- If readily available, details of website usage for the outputs concerned – eg., number of downloads or web hits for the statistical outputs.
- Organisation chart of the statistical output area, including governance arrangements such as steering groups.

SECTION 2 – COMPLIANCE WITH ORGANISATIONAL POLICIES

Your organisation has several policies and statements as required by the Code of Practice. If you do not follow the organisational policy, please explain the reasons for divergence in the box below and provide any appropriate links/documents. For those organisational policies that you follow, please indicate so in the relevant box.

2.1   Arrangements for confidentiality protection (Section 1.5 of the organisational WEFA).

2.2   Quality guidelines (Section 1.9).

2.3   Pricing policy (Section 2.2).

2.4   Recruitment and Learning & Development policies (Sections 2.4 and 2.5).

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2.5   Revisions policy (Section 1.4).

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SECTION 3 – PUBLISHED DOCUMENTATION

For the output or group of outputs that is the subject of this assessment, please provide links to the following information, which the Code of Practice requires you to publish.

3.1   Information about users' experience of statistical services, data quality, and the format and timing of reports. (Principle 1.5).

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3.2   Details of methods used, including why they were chosen. (Principle 4.1).

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3.3   Information about the quality of your statistical output (Principle 4.2, Principle 8.1, Protocol 1.4).

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3.4   Reasons for deviation from common (national or international) standards (if any) (Principle 4.6).

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3.5   Pre-release access lists (if required by the relevant Order), including lists of those who have access to the statistics *not* in their final form (Protocol 2.7).

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SECTION 4 – "OFF THE SHELF" DOCUMENTATION

For the output or group of outputs that is the subject of this assessment, please provide the following additional documents, or links to them if they are published on your website. Many of these documents are requirements of the Code of Practice. However, if specific documents aren't available please discuss with the Assessment Team what alternative evidence might be appropriate.

4.1   Documentation of users' needs and the uses of this group of outputs, which may include results of user surveys, notes of user groups etc (Principle 1.2, Protocol 1.1).

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4.2   Examples of announcements of changes to methods or classifications and details of the extent to which you subsequently revised historical data (Principle 2.4, Principle 4.7).

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4.3   Documents about your quality assurance procedures (Principle 4.3).

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4.4   An example of a questionnaire, survey leaflet etc that shows how you inform respondents how their confidentiality will be protected (Principle 5.3, Principle 6.2).

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4.5   Internal timetables for the production of the statistics (Protocol 2.1).

4.6   Reports of any reviews you have undertaken, or have been undertaken on your behalf, such as Internal Audit reports; Capability Reviews; or reports from audit offices, together with documentation about how you've put the recommendations from such reviews into practice (Principle 4.5).

4.7   If any of the following events have occurred in relation to these statistics, please provide links/documents describing the circumstances surrounding them in the boxes below. If none have occurred, please state "none" in the appropriate box.

a   A delay in the production and publication of the outputs (Protocol 2.1).

b   The statistics were not available through the National Statistics Publication Hub (Protocol 2.3).

c   A deviation from the standard release time of 9:30am (Protocol 2.4).

d   A premature release of an indication of the content of a statistical report (Protocol 2.8).

e   You have corrected errors in statistical reports. Please include how you alerted stakeholders (Principle 2.7).

f   You have faced political pressure to influence the production or presentation of the statistics (Principle 3.2).

SECTION 5 – ADDITIONAL INFORMATION

This section lists the additional information to demonstrate how you comply with various remaining aspects of the Code.

5.1   What information about the needs of users, if any, has influenced the timetable for the release of the statistics (Principle 1.4)?
5.2   Please provide information on whether, and how, you have designed the statistical methods to ensure a level of quality that meets user needs (Principle 4.2)?
5.3   How do you promote comparability with other related statistical outputs, within the UK or internationally (Principle 4.6)?
5.4   In addition to the information you have already provided about your organisational confidentiality protection arrangements, please provide for this group of statistics:
    o details of how you have balanced confidentiality against the need to maintain the utility of the statistics, (Principle 5.4) and;
    o (if publicly available) the detailed methods for statistical disclosure control; and
    o any confidentiality records you keep, relating to statistical records shared with third parties (Principle 5.6).
5.5   If new data collection requirements or surveys have been proposed, what analysis have you done of the costs to data providers, or to investigate the possible use of existing data or estimation techniques instead (Principle 6.4, Principle 6.5)?
5.6   In relation to these statistical outputs, please tell us whether, and how, you have sought to balance quality against costs, both to government and data suppliers (Principle 7.5).
5.7   In relation to these statistics, please tell us what factors you have taken into account when deciding:
    o the level of detail and formats for the outputs (Principle 8.3, Protocol 1.3); and

- how to ensure that the statistics are accessible to a range of different audiences, including those with disabilities (Principle 8.5, Protocol 1.2).

5.8 How do you identify and consult with users about these outputs, including involving them in evaluation of experimental statistics and seeking their feedback on these outputs (Protocol 1.5, Protocol 1.6, Protocol 1.7)?

5.9 Please tell us how you determined whether any administrative data sources you use were suitable for use in the production of these statistics. (Protocol 3.2)

5.10 Please tell us about any steps you may have taken, in relation to these outputs, to:
- maximise opportunities for the use of administrative data, cross-analysis of sources and for the exchange and re-use of data (Protocol 3.3);
- use common information technology and information management systems that facilitate the flow of information between producers of statistics (Protocol 3.3); and
- reduce the risk of the independence of the statistics being compromised after their release (Protocol 3.4).

5.11 What do you consider to be the main strengths and weaknesses of your statistical outputs?

5.12 What do you consider are the main improvements to methods that are required, including those for which additional resources would be needed, to be able to develop and implement them?

5.13 Are there any of the Code's requirements that, in your view, are not being fully complied with? If so, please give brief details here (along with links to any documentation you have about plans to address them) and we will follow these up with you directly. In doing so, please indicate if you think an exemption from the Code requirement may be appropriate.

FEEDBACK

Please make any comments you wish to about this assessment process. Please estimate the total number of person hours it took you to provide this evidence.

When completed, please return this evidence to the Assessment Team at **assessment@statistics.gsi.gov.uk**.

Thank you.

ORGANISATIONAL EVIDENCE FOR ASSESSMENT (Version 1.1, November 2009)

Introduction

The assessment process established by the *Statistics and Registration Service Act 2007* relates to individual statistical outputs. But some elements of the Code of Practice[2] relate to the producer body's practices as a whole. This part of the collection of evidence for assessment covers those policies and practices. The evidence we ask for in this document will apply to all subsequent assessments of your statistical outputs, thereby minimising the burden of the ongoing assessment programme. We will collect specific information for individual (groups of) outputs separately.

Material required

This document asks for the evidence required in four sections:

1. links to documents that the Code requires you to publish.
2. other documents that should be available.
3. confirmation that you follow some standard practices, along with supporting evidence, and details of any exceptions.
4. additional evidence of Code-compliance relating to organisational practices.

The evidence collected in this document covers almost half of the practices in the Code. The relevant principles and practices from the Code are listed against each request.

This document focuses on drawing together existing evidence and asks for the minimum number of specific documents that demonstrate code compliance. You should only need to add a small amount of additional written material. Please don't provide additional documentation that does not relate to compliance with the Code, or that duplicates material provided elsewhere. When providing information, please:

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[1] **http://www.statisticsauthority.gov.uk/assessment/code-of-practice/code-of-practice-for-official-statistics.pdf**

- provide evidence that is specific to your organisation, not generic or GSS-wide;
- refer to relevant content on your website wherever possible and provide direct links;
- refer to published statements and policies that cover your organisational approach to statistical issues; and
- add other existing documentation where relevant, referencing relevant sections.

This document only covers organisation-wide evidence. We will collect information about specific statistical outputs separately during the assessment programme.

It would be helpful for us, and for users, if you publish all the relevant documents required by the Code in a single area of your website. This will enhance accessibility and transparency.

Once completed, this statement of evidence will remain a live document. Please keep us informed as any of the information in the document changes, and confirm during December each year that the information is up-to-date. Please do so by emailing the Assessment Team at **assessment@statistics.gsi.gov.uk**. In the event of other significant organisational changes affecting the statistical production process, such as restructuring of departments, we will discuss with you separately the provision of new organisational evidence.

If you have any enquiries about this request please contact the Assessment Team.

Thank you.

ASSESSMENT TEAM
NOVEMBER 2009
DECLARATION BY HEAD OF PROFESSION (OR EQUIVALENT)

I confirm that the information contained in this form is accurate, as at the date below.

Name:

Organisation:

Date:

SECTION 1 – PUBLISHED DOCUMENTATION

Please provide links to the following documents, which the Code of Practice requires you to publish.

1.1   Timetable of statistics releases over the coming year (Principle 1.4, Protocol 2.2).

[   ]

1.2   Information about users' experiences of statistical services, data quality, and the format and timing of reports (Principle1.5).

[   ]

1.3   Details of all approved exemptions and exceptions to the Code, and any breach reports (Principle 2.5, Protocol 2.8).

[   ]

1.4   Any organisation-level revisions policy (Principle 2.6).

[   ]

1.5   Details of the arrangements for confidentiality protection, including how the arrangements are sufficient to protect the privacy of individual information, but not so restrictive as to limit unduly the practical utility of the statistics (Principle 5.4)

[   ]

1.6   Links to authorisations from National Statistician or Chief Statistician in a Devolved Administration for any exceptions to the principle of confidentiality protection, if any (Principle 5.5).

[   ]

1.7   Annual estimated costs of responding to your organisation's statistical surveys (Principle 6.1).

[   ]

1.8   Published pre-release access lists (if required by the relevant Order), if a single document covers all your organisation's outputs. If pre-release

access lists are linked to individual products we will pick this up during the assessment programme (Protocol 2.7).

1.9   Your organisation's guidelines about quality (Principle 4.4).

SECTION 2 – "OFF THE SHELF" DOCUMENTATION

Please provide the following additional documents, or links to them if they are published on your website. Most of these documents are requirements of the Code of Practice, but you may meet the requirements in different ways, so if the document is not available please say so, and provide any relevant details.

2.1   Documentation of users' needs relating to the statistical service your organisation (as a whole) provides (Principle 1.2, Protocol 1.1).

2.2   Pricing policy for any supplementary statistical services for which a charge is made (Principle 2.9).

2.3   Declarations that staff with access to confidential data have to sign (Principle 5.2).

2.4   Learning and Development policies and competency frameworks (Principle 7.6).

2.5   Documentation on recruitment process for analytical staff (Principle 7.6).

2.6   Details of any accidental or wrongful releases that you investigated and reported to the National Statistician (Protocol 2.8).

2.7   Statement of Administrative Sources (Protocol 3.5).

SECTION 3 – INTEGRITY AND STATISTICAL PRACTICES

Part A

Please give examples of how your organisation meets the following requirements of the Code.

3.1 Those producing statistical reports are protected from any political pressures that might influence the production or presentation of the statistics (Principle 3.2).

3.2 A culture within which statistical experts can comment publicly on statistical issues, including the misuse of official statistics is promoted (Principle 3.7).

3.3 No indication of the substance of a statistical report is made public or given to the media or any other party not recorded as eligible for access before publication (Protocol 2.8).

3.4 Government statements issued alongside statistics, and referring to, or based upon them, meet the standards set out in the Code (Protocol 2.9).

Part B

If any of the following situations have occurred, please give details, including any resulting changes to organisational policies or practice. If none, state "none" in the appropriate box.

3.5 Regular statistical reports not released, free-of-charge, on the internet (Principle 2.8).

3.6 National Statistics releases not accessible from the National Statistics Publication Hub (Principle 2.3, Protocol 2.3).

3.7 National Statistics not issued at the standard time of 9.30am on a weekday (Protocol 2.4).

3.8 Changes to pre-announced release dates not publicised or fully explained (Protocol 2.5).

3.9 Delays to releases influenced by non-statistical matters, or decided by someone other than the statistical Head of Profession (Protocol 2.5)

3.10 Statements or comment about the figures released alongside statistical reports, or statements or comments – based on prior knowledge – were issued to the press or published ahead of the publication of the statistics (Principle 3.1).

3.11 The Head of Profession did not have sole responsibility for deciding statistical methods, standards and procedures, and on the content and timing of statistical releases (Principle 3.3).

3.12 Statutory obligations and internationally endorsed guidelines governing the collection of data, confidentiality, and release not followed (Principle 3.4).

3.13 The National Statistician was not informed about complaints that relate to professional integrity, quality or standards (Principle 3.5)

3.14 Individuals abused the trust placed in them for personal gain (Principle 3.6).

3.15 Statutory guidelines and relevant codes of practice not observed in relation to the handling of personal data (Protocol 3.1).

    _____

SECTION 4 – ADDITIONAL INFORMATION

4.1 Please provide any additional details of organisation-wide initiatives to identify and engage with users, in accordance with Protocol 1 of the Code, which are not already covered above. In particular, please tell us how engagement with users influences statistical planning and priority setting (Principle 1.1, Principle 1.3, Principle 7.2, Protocol 1).

    _____

4.2 Please provide a copy of a business plan that includes your organisation's statistical activities, highlighting:
   • the budget, number of staff, and any budget set aside for user consultation;
   • information about how you monitor expenditure against work programmes and demonstrate effective stewardship of resources allocated to statistical work; and
   • any records you may have showing the relationship between the statistical planning process, the work programme, the allocation of resources, and the outcomes (Principle 7.1, Principle 7.3, Principle 7.4).

    _____

4.3 Please tell us how your organisation publicises its statistical outputs (Principle 8.4).

    _____

4.4 Please tell us what your organisation does to enhance the statistical potential of administrative data, and maximise opportunities for the

use and re-use of administrative data. For example, working with data suppliers to enhance their administrative systems, so they are able to provide more appropriate and timely data. (Principle 6.3, Protocol 3.3).

4.5   Please tell us what your organisation does to maximise opportunities for the use and reuse of data. (Principle 8.6).

4.6   Please tell us about any organisation-wide policy on records management and archiving, which is relevant to how you manage official statistics (Principle 8.7).

4.7   Please provide any additional existing material that helps to demonstrate compliance with particular practices of the Code (at an organisational level). For example:

- any relevant review material you may have that focuses on your statistical operations as a whole, such as Internal Audit reports; Capability Reviews; or reports from audit offices;
- about a brief summary of how you've put the recommendations from such reviews into practice;
- organisation initiatives to reduce burden on data suppliers; and
- statistical policies not covered elsewhere in this document.

Please don't send documentation that doesn't directly demonstrate compliance with any aspect of the Code of Practice. If you are in any doubt about the documentation you think we might want to see, please ask first before sending.

FEEDBACK

Please make any comments you wish to about this assessment process. Please estimate the total number of person hours it took you to provide this information.

When completed, please return this evidence to the Assessment Team at **assessment@statistics.gsi.gov.uk**.

Thank you.

Source agencies providing monthly production data for compilation of All India IIP (Base: 1993-94)

1. Indian Bureau of Mines
2. Directorate of Sugar
3. Salt Commissioner
4. Directorate of Vanaspati
5. Tea Board
6. Coffee Board
7. Textile Commissioner
8. Jute Commissioner
9. Coal Controller
10. M/o Petroleum
11. Joint Plant Committee (JPC)
12. Railway Board
13. D/O Industrial Policy & Promotion
14. Development Commissioner, Small Scale Industries (SSI)
15. Central Electricity Authority

List of items on which information is to be furnished by the CSO (ESD) and all the source agencies on IIP
***

Planning process undertaken for producing the indices

- How the weighting diagram was prepared

- How the item basket was prepared

- How the item basket was distributed among source agencies/ field offices

- How the list of units for reporting data was prepared

- What is the mechanism for including contribution of new units

- How the data collection/ scrutiny/ validation was planned

- How the compilation of index was planned

Action plan, if any, prepared for achieving different milestones in the process

- Data collection

- Data verification by source agencies

- Any releases by source agencies

- Data validation

- Data transmission to CSO (ESD)

- Index compilation by CSO (ESD)/ Source agencies

- Approval for release by CSO

- Release of index and unit-level data to the public

- Analytical report

Basis for weighting diagram and selection of item basket and computation criteria adapted for the purpose

- Which databases were used and how

- What were the assumptions made – were they reasonable

Data collection mechanism

- Who collects data in the field

- Who does quality scrutiny in the field and in the offices of source agencies/ field offices

- Whether data collection is done on statutory basis, if so the details thereof

- What is the response rate (normal & weighted)

- What action is taken in non-response cases

Data processing and dissemination mechanism

- Is there any pre-data entry scrutiny – who does it

- Who makes data entry

- Is there any supervision over data entry personnel

- What action is taken if inconsistencies are found at the time of data processing

- What are disseminated – Is there any declared calendar/ schedule for dissemination

- Who approves release – who has got privileged/ pre-release access to the results

- Any criticism has been received so far on IIP

- Was there any meeting with users or experts in the field

Material to be furnished separately as hard copies/ CDs
- Manuals

The topic-wise summary list of recommendations in the International Recommendations for the Index of Industrial Production 2010

Statistical units, classifications and the business register

i. Topic: *Statistical unit to compile the IIP*

Recommendation: The recommended statistical unit to compile the IIP is the establishment.

ii. Topic: *Classification of products and industries for data collection, compilation and dissemination*

Recommendation: The international reference classification for economic activities, International Standard Industrial Classification of All Economic Activities (ISIC) Rev.4, is the most suitable classification of industries. The Central Product Classification (CPC) Ver.2 is to be used to assign products to product groups.

iii. Topic: *Business register and statistical surveys*

Recommendation: It is recommended that where the IIP is compiled from statistical surveys that:

- a business register provides the basis from which a sampling frame is identified;
- a sample survey be used as a way of minimizing response burden and lowering operational cost;
- the business register be maintained to ensure it remains as representative as possible and contains current information on its constituents; and
- the sample selection is updated each year to coincide with the update of index weights.

iv. Topic: *Data sources – administrative sources*

Recommendation: It is recommended that countries examine opportunities to utilize administrative sources for the purposes of developing and maintaining a sampling frame and as a data source to reduce response burden.

Scope and frequency

v. Topic: *Scope of industrial production indices*

Recommendation: The Index of Industrial Production to be compiled for activities in ISIC Rev. 4 Sections B, C, D and E, i.e. Mining and quarrying, Manufacturing, Electricity, gas steam and air-conditioning supply, as well as water supply, sewerage, waste management and remediation activities.

vi. Topic: *IIP compilation frequency*

Recommendation: It is recommended the IIP be compiled monthly so turning points in economic development can be identified at the earliest possible point in time.

Sources and methods

vii. Topic: *Method to achieve volume estimates for the IIP*

Recommendation: In general, the deflation process with the use of an appropriate price index is recommended.

viii. Topic: *Deflator to be used to achieve volume estimates from value data*

Recommendation: The Producer Price Index (PPI) is recommended as the price index to be used by countries when current price values are deflated to achieve volume measures of output for the IIP.

ix. Topic: *Level at which to apply deflator*

Recommendation: It is recommended the deflator be applied to the value data at the lowest level possible but not higher than the ISIC class (4-digit) level in order to obtain a volume estimate for use in the compilation of the IIP. The detailed PPI used for deflation should be defined as closely as possible (in terms of scope, valuation and timing) to the respective product groups for which it is being used as a deflator.

x. Topic: *Variables to be used to approximate industrial production for the IIP*

Recommendation: In general, measures of output (value of output, physical quantity of output) are preferred to input (labor and materials consumed) measures.

Index compilation

xi. Topic: *Type of index formula to be used*

Recommendation: The Laspeyres index formula is recommended to construct the IIP.

xii. Topic: *Missing data*

Recommendation: Missing data are to be estimated using imputation techniques or an administrative data replacement strategy so the data matrix is complete.

xiii. Topic: *Data adjustments – quality change*

Recommendation: Quality changes should be incorporated into the calculation of the IIP either via the use of the price index when deflation methods are employed, or by adjusting input data when volume extrapolation methods are used.

xiv. Topic: *Weighting variable – industry level of the index*

Recommendation: Gross value added at basic prices data is recommended as the weight variable to compile the IIP for the levels of the ISIC structure.

xv. Topic: *Weighting variable – product group level of the index*

Recommendation: Value of output is recommended as the weight variable to compile the IIP at the product group level of the index.

xvi. Topic: *Frequency of weight update – industry level of the index*

Recommendation: Industry level weights of the IIP should be updated annually.

xvii. Topic: *Frequency of weight update – product group level of the index*

Recommendation: Product group weights should be updated at least every 5 years.

xviii. Topic: *Incorporating new weights into the IIP*

Recommendation: The chain linking method should be used when weights are updated, i.e. the new series should be linked to the old series to produce a continuous series.

xix. Topic: *Quantity reference period of the IIP*

Recommendation: The *quantity reference period* is the period whose volumes appear in the denominators of the volume relatives used to calculate the index and is calculated as the monthly average of the base year.

xx. Topic: *Weight reference period of the IIP*

Recommendation: The *weight reference period* is the period, usually a year, whose values serve as weights for the index. As a consequence of implementing the recommended approach, i.e. Laspeyres-type volume index with weights updated annually, the selection of a weight reference period is no longer arbitrary. The weight reference period will always be the most recent period (year) for which weights are available.

xxi. Topic: *Index reference period of the IIP*

Recommendation: The *index reference period* is the period for which the index is set equal to 100. The index reference period should be a year and be updated each time the weight reference period is updated.

xxii. Topic: *Aggregation of the IIP*

Recommendation: Aggregation from basic data items (products or product groups) should be done directly to industries, without an intermediate step of calculating indexes for establishments. Aggregations to higher-level industries should be done in steps, in the case of ISIC through each level of ISIC, using the existing ISIC structure. That is, index numbers at the ISIC class (4-digit) level should be aggregated first to the ISIC group (3-digit) level, then to the ISIC division (2-digit) and finally section (1-digit) level.

xxiii. Topic: *Data adjustments – seasonal adjustment*

Recommendation: Seasonal adjustment should be applied to the IIP data; occur at the lowest level of aggregation for which reliable estimates can be obtained; and occur every period the IIP is calculated.

xxiv. Topic: *Reconciliation of IIP data with other data sources*

Recommendation: The IIP could be reconciled with other data sources essentially in an attempt to identify any significant quality issues. This reconciliation could occur against various data sources, one of which could be the annual national accounts.

xxv. Topic: *Quality review*

Recommendation: A quality review of the IIP should be undertaken every four or five years, or more frequently if significant new data sources become available.

Presentation and dissemination

xxvi. Topic: *Presentation of the IIP – data*

Recommendation: The following key presentation principles should be followed for an index of industrial production:

- Both trading day adjusted data series and seasonally adjusted data series to be published;
- Index numbers rather than monetary values should be used to present industrial production volume measures;
- Index numbers to be presented to one decimal place;
- Changes between month-to-month and change from the same month one year earlier to be presented;
- A reference period needs to be determined and convention is that this period is set to an index number of one hundred (100.0). Index numbers for all subsequent periods are percentages of the value for the reference period;
- The main contributors to change to be presented to users. That is, those product groups or industries that are primarily responsible for the monthly movement in the IIP; and
- Long (at least 5 years) and coherent time series to be provided to users

xxvii. Topic: *Presentation of the IIP – metadata*

Recommendation: The following metadata should be provided:

- Precise definitions of the underlying economic concepts the indices intend to measure;

- Specific mention of any limitations in the use or application of the indices;
- Descriptions of the methodologies used in the compilation of the index, with particular reference to the index calculation methods entailing the choice of index formula and the strategy for constructing the index series;
- Weighting system used, weight revision practices and frequency of weight revision;
- Computation at various aggregation levels, selection of base year (weight reference period), frequency of re-basing and procedures for linking indices;
- Treatment of changes in the composition of commodities in the market as well as changes in quality; and
- Comparison of the methodologies applied with underlying index concepts and a description of the impact of departures.

xxviii. Topic: *Dissemination of the IIP*

Recommendation: Key recommendations include:

- Data to be released as soon as possible (noting the trade off between timeliness and quality);
- Data released according to a set timetable;
- Confidentiality of individual survey respondents to be maintained;
- Data to be made available to all users at the same time;
- Consistent presentation and reporting practices over time;
- Weights by industry to be made available to users;
- Data to be accompanied by the methodological explanation and advice;
- Data to be accompanied by commentary that assists users to make their own judgments about the economic implications, i.e. the commentary should not make any assessment of current government policies;
- Contact details of relevant statisticians who can answer various questions by users to be included with the release of data.

xxix. Topic: *Data Revisions*

Recommendation: It is recommended that the following revision practices should be followed by countries:

- It is important to consult main users of official statistics to identify needs and priorities specific to individual countries;

- A statement by the national statistics office about the reasons and scheduled revisions should be made public and readily accessible to users;
- The revision cycle should be relatively stable from year to year. Users place great importance on a revision schedule that is regular;
- Major conceptual and methodological revisions should usually be introduced as required, balancing need for change and users' concerns;
- Revisions should be carried back several years to give consistent time series;
- Details of revisions should be documented and made available to users. The basic documentation should identify data in the statistical publications that are preliminary (or provisional) and revised, explaining the sources of revisions, and explaining breaks in series when consistent series can not be constructed; and
- Users should be reminded of the size of the likely revisions based on past history.

xxx. Topic: *International data reporting*

Recommendation: International reporting of IIP data to occur at a quarterly frequency with a lag of no more than 3 months after the reference period and, as a minimum, at the 2-digit level of ISIC Revision 4.

Important Technical Specifications in respect of outsourcing of data collection as per the Agreement signed between DIPP& CMIE

1) DIPP has granted to CMIE the authority to store all the Information it obtains from the units in the Frame as well as from the DIPP in its original or processed form. CMIE may store the Information in print or electronic media. The Information so collected will not be diverted to other agency and will be treated as confidential. The safety of preserving the information will be the responsibility of CMIE.

2) CMIE does not have the authority to reject the information on its own. DIPP will be taken into confidence before rejecting the information. In such a case, CMIE would seek clarifications from the relevant units to ensure that the information obtained is reliable.

3) The DIPP provided CMIE with the detailed list of manufacturers of the Products as per the Annual Survey of Industries which included the name of the unit, the quantity and value of production (wherever available) of the various products manufactured by the unit, the name of the owning entity, the address of the unit and its owning entity, contact details such as address, email address, telephone numbers, fax numbers, names of persons etc.

4) The DIPP would provide CMIE access to all such information, whether of historical or current nature, that it may have or may procure, and that may be useful to CMIE to execute this Agreement.

5) CMIE will update the list of units in the Frame every month. Keeping in view the Information obtained from the units as well as from other sources. This is a critical part of the project and the CMIE would use its best resources to ensure the collection of Information.

6) CMIE's Application Software: CMIE has developed application software and installed at the DIPP. CMIE will maintain the application software installed at DIPP.

7) The CMIE will collect the Information from the units in the Frame on a monthly basis. It would put this Information in database and transmit the same to the DIPP.

8) CMIE would have access to data collected by DIPP from the units. CMIE would organise its resources to collect such information on a daily basis.

9) The CMIE shall ensure the safety and confidentiality of all the Information it obtains as a result of the execution of this Agreement.

10) The CMIE shall not make public or reveal to any person or organization, other than DIPP, the Information it collects from the units in the Frame in the course of the execution of this Agreement, unless, it is explicitly permitted to do so in writing by the responding unit.

11) The CMIE would have no right over the Information it collects in the course of the execution of this Agreement. In case CMIE desires to use the Information, it may approach DIPP and enter into a separate agreement on mutually agreed terms.

12) The CMIE would use its human resources, its judgements and its databases to cross check the Information provided by units in the Frame. CMIE would be responsible for correctness of the information provided by the units in the Frame.

13) CMIE would pass on all the correspondences, production details obtained from the units in the Frame to DIPP in CDs/DVDs after every three months period.

14) The CMIE would deliver to the DIPP a Report on the units in the Frame once in three months incorporating the changes, if any, in the Frame.

15) The CMIE would deliver all the Information it collects from the units in the Frame. Such Information would be delivered to the DIPP every month by last day of month in respect of data for the preceding month/s. CMIE would also provide updates that it receives after the weekly update to ensure the updatedness of the Information DIPP may provide for the generation of the IIP. CMIE would also provide to the DIPP every month a brief report on the number of respondents and the response rate.

16) The CMIE's role will not be limited to data collector. It would also assist DIPP in carrying out statistical tests and analysis using the data collected to strengthen the statistical base and the quality of output. To achieve this, CMIE should be given full control to execute the assignment and will be held exclusively responsible for the response rate to be achieved.

Order
appointing Dr. N. S. Sastry, as Consultant
for conducting statistical audit
* * *

F. No. 1/3/2006-NSC
Government of India
Ministry of Statistics and Programme Implementation
National Statistical Commission Secretariat

II Floor, Sardar Patel Bhawan,
Sansad Marg, New Delhi -110001,
the 9th July 2010.

ORDER

Sub: Statistical audit of all India IIP.

The National Statistical Commission (NSC) is mandated under the Government of India Resolution issued vide Notification No. 85 dated 1st June 2005 (published in the Gazette of India, Extraordinary, Part-III-Section 4) to exercise statistical audit over the statistical activities to ensure quality and integrity of the statistical products. The matter was considered by the NSC in its 30th meeting held on 17th & 18th February 2010 and it has been decided to have a statistical audit conducted by Dr. N.S. Sastry, former Director General of the National Sample Survey Organisation (NSSO) on the all India Indices of Industrial Production (IIP) compiled by the Central Statistical Office (CSO), as a test case, before laying down comprehensive methodology for the purpose. The terms of reference for the audit shall include studying deficiencies, if any, in the following aspects:

    (i)   Planning process undertaken for producing the indices
    (ii)   Action plan, if any, prepared for achieving different milestones in the process

(iii)   Basis for weighting diagram and selection of item basket and computation criteria adapted for the purpose

(iv)   Data collection mechanism

(v)   Data processing and dissemination mechanism

2.   The Economic Statistics Division (ESD) of the CSO, which compiles the IIP and the source agencies which furnish statistical information to the ESD for compilation of the indices, namely, the Departments/ Offices given in the Annexure and the Industrial Statistics Wing of the CSO are requested to furnish suo motu all the relevant files, records, data and reports to the audit party for the purpose of exercising statistical audit. In case, any of these are under current use, copies may be furnished to the audit party. The organisations are also requested to furnish replies to the memos issued by the audit party during the course of the audit.

3.   **Dr. Sastry would undertake the work intermittently over a period of three months w.e.f 1st August 2010** at a consolidated fee of Rs.75,000/-. His audit may include processing of data for which the services of Computer Centre may be made available by the CSO. The Computer Centre would provide support for generating any reports out of the data made available to the audit party. The NSC Secretariat may provide logistic and secretariat support to Dr. Sastry.

4.   The working of Dr. Sastry would be further subject to the following conditions.

(1)   He is entitled to travel by Executive Class in Air India Flights and for all other travel costs including local travel costs for the purpose of the audit, including field visits to be carried out during the course of audit, on par with the Director General, NSSO.

(2)   He will submit progress reports to the Chairman, NSC by 7th of every month indicating the progress achieved, and the impediments, if any, in conducting the audit.

(3) He will submit final report on the audit exercise undertaken by him to the Chairman, NSC within 10 days on completion of the work. The report shall include the list of records, files, documents and data consulted as also the replies given to the audit memos. The final report shall also include the total expenditure incurred on the audit exercise.

(4) The CSO and other Govt. Departments would be requested to extend all necessary support to Dr. Sastry in his study.

(5) The material emanating from the study of Dr. Sastry including the reports generated would be the property of the NSC and Dr. Sastry will not have any right to divulge it to any one or publish the whole or any part of it under any circumstances.

5. The expenditure will be debitable to relevant heads under non-plan Major Head 3451 - Secretariat Economic Services, 00.090 - Secretariat (Minor Head), 51- National Statistical Commission, 01-Establishment under Grant No.90 - Ministry of Statistics & Programme Implementation during 2010-11.

6. This issues with the concurrence of IFD vide their Dy. No. 473/B&F dated 7th July 2010.

Sd/-
(M.V.S.Ranganadham)
Dy. Director General
Telefax: 011-23367128
Mob: 919818878155
E-mail: **nsc-secretariat@nic.in**

Copy to: -

1. Dr. N. S. Sastry, Retd. Director General of NSSO, Flat: C-329, Block-C, Divyajyothi Apartments, Sector-19, Rohini, Delhi – 110 089. (Tele: 011-27856844 (R), Mob No: 9868619041). E-Mail address: **nittala_ssastry@yahoo.co.in**, **n.s.sastry@hotmail.com**
2. Director General, Central Statistical Office.
3. Director General, National Sample Survey Office.
4. Addl. Director General, CSO (ESD), 8th Floor, Jeevan Prakash Building, New Delhi with spare copies for distribution to source agencies. It is requested that copies of this order may be forwarded to the Source Offices of IIP.
5. The Departments/ Offices that are source agencies for IIP through Addl. Director General, CSO (ESD)
6. Dy. Director General, CSO (IS Wing), Kolkata
7. Dy. Director General, Computer Centre, R.K.Puram, New Delhi.
8. Joint Secretary (Admn), MOSPI, New Delhi
9. Director & HOD, MOSPI, New Delhi
10. Director (IFD), MOSPI, New Delhi w.r.t their Dy. No. 473/B&F dated 7-7-10.
11. Pay & Accounts Officer, MOSPI, New Delhi.
12. Admn. I Section, MOSPI, New Delhi
13. General Section, MOSPI, New Delhi
14. Cash & Accounts Section, MOSPI, New Delhi
15. Hindi Section for Hindi version

Copy also for information to: -

1. Chairman & Members of the NSC.
2. PS to Secretary (S & PI)
3. PS to AS (S & PI)

Sd/-
(M.V.S.Ranganadham)
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E-mail: **nsc-secretariat@nic.in**

Source Agencies for IIP

1. Indian Bureau of Mines
2. Directorate of Sugar
3. Salt Commissioner
4. Directorate of Vanaspati
5. Tea Board
6.   Coffee Board
7. Textile Commissioner
8. Jute Commissioner
9. Coal Controller
10. M/o Petroleum
11. Joint Plant Committee (JPC)
12. Railway Board
13. D/o Industrial Policy & Promotion
14. Development Commissioner, Small Scale Industries (SSI)
15. Central Electricity Authority