Report of the Working Group for Development of Methodology for Compilation of the All-India Index of Industrial Production with Base Year 2009-10/ 2011-12

April 2014

GOVERNMENT OF INDIA

MINISTRY OF STATISTICS AND PROGRAMME IMPLEMENTATION

CENTRAL STATISTICS OFFICE

ECONOMIC STATISTICS DIVISION

REPORT OF THE WORKING GROUP FOR

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PREFACE

The Index of Industrial Production (IIP) is a closely followed high frequency indicator of the performance of the economy and a critical input into other measures of the economy, in particular the quarterly, advance, revised and quick estimates of the National Accounts Statistics. It is also a bellwether indicator of the direction of the economy for businesses and professional analysts whose collective interpretation fashions and shapes the process of decision making in the economy at large.

The present IIP series is constructed with base year 2004-05. There is more than one reason for frequent recasting of the base year for IIP in India. First, our economy is still developing and the nature and complexity of the industrial sector is rapidly evolving. Second, the classification system for industries and products has undergone a fundamental transformation. Third, there are many heritage elements in the way data is collected, presented and treated which require overhaul. Fourth, the rate of growth of output of individual products can and does vary widely. Periodic revision of the base year and weighting diagram of the series is the best way to integrate these changes explicitly in the index. Fifth, there needs to be a means of making adjustments and fine tuning between base year revisions to take account of the commissioning of large new facilities, incorporating it suitably in the frame, taking cognizance of completely new items of production and taking account of problems that may have arisen in the course of the previous year; an annual inter-departmental review at the beginning of each fiscal year has been recommended for this purpose.

The Working Group was constituted in May 2012 with the understanding that the work will be completed within one year. Several sub-groups were constituted, which by and large completed their findings and reports by the middle of 2013. However, the classification issue and the actual process of data collection were found to be one which needed much closer re-examination. This process which involved extensive discussion with the concerned officers in the field formations of the NSSO and in some cases with units that were reporting output data to DIPP took considerable time. Following on this extensive recasting of the classification structure and the way products had moved from the pre-existing ASICC to the NPCMS (2011) and modifications that needed to be made to the NPCMS also proved to be a challenging exercise. The two elements of process review and rectification has taken the better part of six months. In consequence, the report with its weighting diagram was finally completed in February/ March 2014.

A draft report was circulated to members, in advance of the sixth and final meeting of the Working Group held on 24 March 2014. After due deliberation and having taken into account all the points that were raised by members, the Working Group decided to adopt the report subject to some small changes to be made in the report.

Initially, the Working Group had worked on the premise that the new base year would be 2009-10, in line with what the thinking was about the new base year for NAS. One of the sub-groups has investigated the suitability of using 2009-10 as a base year and come to a favourable conclusion in this regard. However, subsequent to the completion of the 68th Round of the NSSO (2011-12), the new base year for NAS was proposed to become 2011-12. It was highly desirable that the IIP (and similar other indices) share the same base year as the NAS. However, detailed data from the ASI for 2011-12 was not available before the Working Group completed its report. It is understood that this data will become available before the end of June 2014.

Therefore, the Working Group took the view that while (a) a commodity basket has been drawn up on the basis of the general principles of product selection based on ASI data for 2009-10 and (b) a weighting diagram has been prepared with 2009-10 as base year, the suitable and appropriate base year should be 2011-12. Since the time gap is only two years, it is most likely that the general principles would when applied to ASI 2011-12 data will throw up a commodity basket nearly identical to that drawn for 2009-10. Therefore, the approach should be one where taking the commodity basket drawn up for 2009-10, the ASI 2011-12 is examined with a view to see what addition or deletion may be called for. Then make these changes and recomputed the weighting diagram. There is absolutely no need to start *ab initio* with the 2011-12 ASI data. This process can be readily completed once the ASI data becomes available. Guidance from NSC is always available if need be and if required informal consultations with the external members of the Working Group can be had if it is felt required.

In the course of the examination of the data, its volatility and quality several things came up.

First was the unit in which the data was being reported. In most cases the reporting unit was a physical measure. While this is appropriate in many cases that is not so in several others; and especially for capital goods (machinery and the like) and for products where there *inter se* significant differences in the intrinsic nature of the product(s), even when they are grouped under the same product head. In order to resolve this issue, it was decided that the reporting unit for all capital goods and some others would be changed from a measure based on quantity to one of value.

That would mean that these value measures would have to be deflated by an appropriate price index. This would be easier if there were to greater if the product categorization in both indices were to be as similar as possible. The task was made easier since the undersigned was also Chair of the Working Group on the recasting and rebasing of the Wholesale Price Index. One can say with some satisfaction that the correspondence between the proposed commodity list and classification for the WPI matches very closely with that being proposed for the IIP. Both indices are also proposed to be based on 2011-12, making the job more robust. The proposed WPI does not include central excise duty and would on that score be closer to the concept of a producer price index, making the deflation of current output values to base year prices sounder.

Second was the concept of output, particularly in the machine building sector. The manufacture of many items of equipment – turbo generators and boilers for power plants, ships and similar vessels – take a long time in completion, even more than one year. That does not mean that there is no level of economic activity involved that is month-to-month in nature. Nor does it mean that the net sales made in that month, has any concordance with the value of output in that month. The appropriate measure is the value of output which most large manufacturers regularly record as part of their own management systems to ensure that the execution of the order is on the design time schedule. This value of output in such cases has a conventional definition and it was decided that the output data sought and recorded from these entities would be the value of output thus defined.

In the past several years economic growth has slowed and the IIP has shown very low growth and often negative growth. There have also been large differences in some years as between the rates of manufacturing output growth that was reported by the IIP and that emerging out of the ASI surveys which come about two years after the end of the concerned financial year. The two elements combined into a great deal of concern about what the critical high frequency indicator, namely, the IIP was reporting and of its quality. This Working Group set about their task in this context, being acutely aware of the seriousness of the enterprise. As is described in detail in the report, the Working Group has gone to somewhat unusual depths in this process of enquiry – including detailed interaction with the field personnel involved in data collection and in the minutiae of classification of commodities and industries. All of us who have been involved in the exercise sincerely hope that the index that emerges will be stronger and more robust and will be able to discharge the responsibility and expectations that people have of it.

I am grateful to all the members of the Working Group and officials who have assisted in its workings – both formally and informally. In particular, I would like to place on record the excellent contribution made by the Chairpersons and members of the sub-groups for diligently carrying out the mandate given to them, for showing great patience at every stage and finally help shape the deliberations and the reports of the respective Sub Groups and eventually final report of the Working Group.

The officers of the CSO and DIPP must deserve special commendation for their attention to detail and for the painstaking following through on the several unusual forays that the Working Group made in extended interaction with the field formations and other agencies involved in the collection of data and also in bravely going through the time consuming and detailed re-examination of the entire product and industry classification. Special mention is needed to be made of S/Shri G C Manna, S. Chakraborty, A.K. Sadhu, Ms Ambika Anand, S/Shri C. Chatterjee, A. Bhattacharyya from CSO; Smt. Aditi Ray and her colleagues from DIPP; S/Shri V.K. Bajaj, K.P. Unnikrishnan, Smt. Shalini Bhoyar, S/Shri Ahmed Ayub and B.B. Singh from FOD; Dr Savita Sharma, Adviser, PPD, Planning Commission.

It is my sincere wish that the new IIP constructed based on the deliberations of the Working Group with base year 2011-12 will be an improvement and will contribute to strengthening the statistical system of the nation's economy.

SAUMITRA CHAUDHURI
Member, Planning Commission &
Chairman of the Working Group

Dated: 28 April 2014, New Delhi

ACRONYMS

ASI	Annual Survey of Industries
ASICC	Annual Survey of Industries Commodity Classification
BR	Business Register
CIF	Chief Inspector of Factories
CPC	Central Product Classification
CSO	Central Statistics Office
CSO (IS wing)	Central Statistics Office (Industrial Statistics Wing)
DIPP	Department of Industrial Policy and Promotion
ESD	Economic Statistics Division
FOD	Field Operations Division
GVA	Gross Value Added
GVO	Gross Value of Output
IIP	Index of Industrial Production
IRIIP	International Recommendations for Index of Industrial Production
ISIC	International Standard Industrial Classification
MoCA	Ministry of Corporate Affairs
MoSPI	Ministry of Statistics & Programme Implementation
n.e.c.	Not Elsewhere Classified
NAD	National Accounts Division
NAS	National Accounts Statistics
NIC	National Industrial Classification
NPCMS	National Product Classification for Manufacturing Sector
NSSO	National Sample Survey Office
SCIS	Standing Committee of Industrial Statistics
SG	Sub-Group of the Working Group
TRC	Technical Review Committee
UNSD	United Nations Statistics Division
WG	Working Group

CHAPTER I

INTRODUCTION

1.1 Existing Framework

1.1.1 The current series of Index of Industrial Production (IIP) with the base year 2004-05=100 came into effect from June 2011, as the CSO released the monthly indices for the months of April 2005 to April 2011. The new series replaced their earlier indices (as corresponding to the base year of 1993-94) with those corresponding to a new basket of items and to the new base year 2004-05. From July 2011 onwards, the CSO has released the monthly IIP for every month following April 2011 on month-to-month basis. The framework of this series of the IIP having the 2004-05 data forming the reference elements for temporal comparison is the currently existing framework for review in the present context.

1.1.2 The IIP in India under the existing framework is a monthly index for measuring short-term changes in production based on data on 399 item groups[1] obtained from 16 source agencies (refer Table 1.1). The source agencies cover selected production units comprising either all units of production for a particular item-group (on census basis) or a sample set of units for some other item-group, depending on the availability of data from the source agency for the item-group concerned. These source agencies are department/ organisations/ Ministries in the Government of India which provide data to the CSO by various methods including hard copies, e-mail and fax. The data is provided to the CSO after the source agencies

[1] The Item basket consisting of 620 specific items with the Annual Survey of Industries Commodity Classification (ASICC) codes was reorganized by regrouping the items into 399 item-groups for collection of data. Reference to items and item-groups has been made interchangeably in this report for the sake of ease in comprehension.

get the primary (i.e. those received data from the units of production) validated using their own methods specific to individual item-group(s).

1.1.3 The IIP under the existing framework is compiled using Laspeyres' index formula with the fixed base year. It uses the relative share of the value of production/ output of each of the items in base year as the weight of individual item. The IIP is currently a hybrid index using a mix of products whose output is reported either in quantities or in monetary values at current prices. The monetary values are deflated with price indices[2] corresponding to appropriate product or product group to which the item(s) aligns the best to get quantity relatives.

1.1.4 The IIP basket of items under the existing framework comprises 3 sectoral categories namely the mining, manufacturing and electricity sectors, with relative weights (as per GVA share in the national GDP of manufacturing industry) of 14.16%, 75.52% and 10.32% respectively in the 2004-05 base year. While each of Mining and Electricity industries individually constitutes one composite item in the basket, the manufacturing industry is represented by the remaining 397 item-groups in the basket of IIP. The distribution of weights across the data source agencies has been shown in **Table 1.1** in number per thousand instead of per cent i.e. when divided by 10, the number represents percentage share.

1.1.5 In keeping with the international standard[3] the indices are brought out with a lag of 42 days (6 weeks) from the close of the reference month. The results are compiled and presented at various levels of disaggregation as per *National Industrial*

[2] At present, there is no "Producer's Price Index" (PPI) compiled in the national system of statistics. In absence of PPI, Whole sale Price Index (WPI) numbers are used for price deflation in the IIP compilation.

[3] IMF's Statistical Data Dissemination Standards (SDDS) prescribes the 6 weeks or 42 days lag following the close of the reference month as the standard benchmark time for making the monthly IIP available in the public domain

Classification (NIC), 2004. The indices and growth rates are also compiled and presented for a different grouping of the items according to an accepted *use-based classification* (UBC)[4]. A press statement showing the indices and growth rates at various levels of NIC and UBC is published in e-mode making the results available in the public domain (website: www.mospi.nic.in/www.pib.nic.in) on the 12th day of every month (or the previous working day). The detailed data on quantity of production at the item group level are also made available on request and payment of a nominal fee.

Table 1.1

Distribution of items and their weights in IIP according to Sources of data under the existing framework (2004-05=100)

Sl. No.	Sector (Number of Items)	Source Agency	No. of Items	Weights
1	Mining (1)	Indian Bureau of Mines	1	141.57
2	Manufacturing (397)	Directorate of Sugar	1	15.25
3		Office of Salt Commissioner	1	0.53
4		Directorate of Vanaspati, Vegetable Oils and Fats	11	9.17
5		Tea Board	1	6.51
6		Coffee Board	1	0.35
7		Office of Textile Commissioner	13	52.10
8		Office of Jute Commissioner	7	4.07
9		Office of Coal Controller	3	2.96
10		M/o Petroleum & Natural Gas	11	59.39
11		Joint Plant Committee	21	92.07
12		M/o Railways	6	2.20
13		Department of Industrial Policy & Promotion	268	456.26
14		Department of Chemicals & Petrochemicals	47	41.87
15		Department of Fertilizers	6	12.54
16	Electricity (1)	Central Electricity Authority	1	103.16

[4] The items in Item Basket are classified into basic goods, capital goods, intermediate goods, consumer durables and consumer non-durables under the accepted UBC.

1.2 Objectives of the Working Group

1.2.1 In the system of a fixed base index, it is necessary to progressively advance the base period from time-to-time towards the current period of measurement in order to adapt to the structural changes in the product-composition of different industries. Being a measure of short term changes, the index has to reflect the changes in the industrial sector in India even as it is undergoing quick and fundamental changes with the growth of the economy. The product composition of the current series of IIP corresponds to the base year 2004-05 and does not reflect the shift taken place in the intervening period in the product line of the concerned industries with the advent of new technology and global integration of the Indian market. A need was felt therefore, to update the base year to a more recent one so that the changes in the industrial sector can be taken into account more accurately. The IIP being an important indicator for policy makers and considering the fact that the revision of base year of the IIP entails many critical aspects, a high level Working Group (WG) was constituted under the Chairmanship of Shri Saumitra Chaudhuri, Member, Planning Commission, Government of India and with members drawn from various stakeholder Ministries/ Organizations and academics of repute in the field of Industrial Statistics. (The Office Memorandum for constitution of the Working Group is at **Annexure I**[5]). The Terms of Reference (ToRs) of the WG are as under:

a. To review the existing methodology for compilation of All India Index of Industrial Production (IIP) and suggest improvements in the context of international practices.

b. To consider the Report of the Standing Committee on Industrial Statistics (SCIS) regarding selection of base year (2009-10) of the index and also to examine possibility of using chain base index.

c. To finalize weighting diagram for IIP and selection of item basket for the purpose.

[5] The Tenure of the WG was extended three times after its scheduled expiration on 3rd May 2013. The office orders for extension of the tenure are also appended at the end of Annexure I as Annex IA, IB and IC.

d. To identify agencies for collection of production data for the purpose of compilation of IIP and also to examine feasibility of integration of data collection for IIP and WPI for common set of factories.

e. To suggest procedures for substitution of factories in case of closure or change in production line and also to suggest measures to suitably take into account new large sized factories, which come in production during a particular base period.

f. Any other area which Working Group may consider necessary and relevant for the purpose of compilation of IIP.

1.2.2 The WG in its first meeting had decided to divide the tasks of the entire working group into non-overlapping sets of work, particularly addressing issues/ technical problems to be dealt by smaller sub-groups formed from the members of the WG. The composition & ToR of the sub-groups under the WG are stated in the following sections.

1.2.3 Composition & TORs of Sub-Groups under the WG: Five sub-groups were formed with the following composition and terms of reference to examine in detail the issues of concern and submit their respective reports on the same.

1.2.3.1 Sub Group I: Composition

Head of Sub-Group I: Dr. R. Nagaraj, Professor, IGIDR, Mumbai

Other Members:

Dr. A. K. Srimany, Adviser, Reserve Bank of India, Mumbai

Shri K. Thomas, Deputy Director General, Indian Bureau of Mines, Nagpur

Shri Sukhvir Singh, Director, M/o Petroleum &Natural Gas, New Delhi

Shri Soumya Chakraborty, Director, National Sample Survey Office (Data Processing Division), Kolkata

Dr. Kanhaiah Singh, Senior Fellow, NCAER, New Delhi

Dr. D. R. Babu Reddy, Agronomist, Coffee Board, Bangalore

Deputy Director General, Economic Statistics Division, CSO

Terms of Reference of Sub-Group I:

- Examining the International Recommendations for IIP made by UNSD and exploring the feasibility of implementation in all-India IIP
- Suggest methodology and modifications in existing system for adopting international recommendations particularly regarding scope, de-seasonalization, chain-base index, etc.

1.2.3.2 Sub Group II: Composition

Head of Sub-Group II: Director General, CSO

Other Members:

Shri M. C. Singhi, Sr. Econ. Adviser, Deptt. of Economic Affairs

Shri Rajan Sehgal, Chief Director, Directorate of Sugar, New Delhi

Shri Himanshu Joshi, Director, Reserve Bank of India, Mumbai

Dr. Kanhaiah Singh, Senior fellow, NCAER, New Delhi

Shri NareshTakkar, Managing Director, ICRA Ltd, New Delhi

Deputy Director General, Economic Statistics Division, CSO

Terms of Reference of Sub-Group II:

- Scope of IIP
- Selection of a representative item basket
- Derivation of weighting diagram for the selected items
- Selection of elementary source units (factory/ mill etc.) for collection of production data
- To suggest procedures for substitution of factories in case of closure or change in production line and also to suggest measures to

suitably take into account new large sized factories, which come in production during a particular base period.

1.2.3.3 Sub Group III: Composition

Head of Sub-Group III: Principal Adviser, Office of Economic Adviser, DIPP

Other Members:

Shri P. C. Mohanan, DDG, Computer Centre, Ministry of Statistics & PI

Shri G. K. Basak, Executive Secretary, Joint Plant Committee, Kolkata

Dr. A. K. Srimany, Adviser, Reserve Bank of India, Mumbai

Ms. Sonal Varma, Economist, Nomura Securities Pvt. Ltd., Mumbai

Dr. C. S. Rao, Chief Economist, ASSOCHAM

Shri R. B. Nair, Assistant Director, O/o Textile Commissioner

Shri M. A. Khan, Assistant Director, Directorate of Vanaspati, Veg. Oils & Fats

Ms.Vishu Maini, Deputy Director General, DIPP

Terms of Reference of Sub-Group III:

- Examining existing system of scrutiny and validation of data and suggest modifications
- Missing data and data adjustment
- Deciding appropriate deflator to be used and level at which to apply deflator
- Seasonal adjustment of IIP
- Dissemination and presentation of IIP data

1.2.3.4 Sub Group IV: Composition

Head of Sub-Group IV: Dr. S. L. Shetty, EPWRF

Other Members:

Deputy Director General, National Sample Survey Office (Field Operations Division)

Dr. Romesh Kolli, Retd. Additional Director General, CSO

Shri Naresh Takkar, Managing Director, ICRA Ltd, New Delhi

Shri G. K. Basak, Executive Secretary, Joint Plant Committee, Kolkata

Shri Himanshu Joshi, Director, Reserve Bank of India, Mumbai

Shri A. K. Biswas, DDG, CCO, Kolkata

Shri Bivas Chaudhuri, Director, CSO (IS Wing), Kolkata

Shri M. A. Ansari, Dy. Salt Commissioner, Jaipur

Deputy Director General, Economic Statistics Division, CSO

Terms of Reference of Sub-Group IV:

- Examining existing data collection system;
- Exploring possibility of developing a single dedicated data collection mechanism;
- Identifying agencies for collection of production data for the purpose of compilation of IIP;
- Studying data collection system in other countries; and
- Integration of data collection for WPI and IIP.

1.2.3.5 Sub Group V: Composition

Head of Sub Group V: Dr. Biswanath Goldar

Other Members:

Shri M. C. Singhi, Sr. Econ. Adviser, Deptt. of Economic Affairs

Shri B. K. Giri, Deputy Director General, CSO (IS Wing), Kolkata

Dr. A. K. Srimany, Adviser, Reserve Bank of India, Mumbai

Shri M. P. Johnson, Deputy Director General, D/o Fertilizers

Dr. C. S. Rao, Chief Economist, ASSOCHAM

Ms. Pranjul Bhandari, O/o Dy. Chairman, Planning Commission

Ms. Sonal Varma, Economist, Nomura Securities Pvt. Ltd., Mumbai

Deputy Director General, Economic Statistics Division, CSO

Terms of Reference of Sub Group V:

- Studying growth rates data based on ASI vis-à-vis IIP
- Reconciliation of IIP data with other data sources
- Finding reasons for divergence

1.2.4 Plan of the Report

1.2.4.1 The Working Group has had six meetings and this report has been prepared on the basis of the conclusions reached through these meetings and also taking into account the recommendations of the sub-groups. Minutes of the meetings of the Working Group are at **Annexure XI to XVI**. This report is divided into six chapters.

Chapter I provides an introduction to the existing mechanism for compiling the Index of Industrial Production, and setting up of the Working Group for developing the new series of IIP - the sub groups under the Working Group, their compositions and Terms of References.

Chapter II deals with challenges faced in the compilation of IIP Statistics in the existing mechanism and also the challenges that are likely to arise in the new series pertaining to the revised base year. The Chapter also proposes solutions for the likely problems in the new series.

Chapter III deals with the conceptual foundations leading to the compilation of the IIP in the new base year, including definitions of all relevant terminologies and the related concepts.

Chapter IV gives the methodological framework adopted in the revision of base year. This includes the adoption of new base year, commodity basket, weighting diagram, proposed data flow architecture and method of compilation and dissemination.

Chapter V deals with proposed solution for enhancing the quality of data and integration of systems for collection of data.

Chapter VI gives the summary of recommendations of the Working Group.

CHAPTER II

CHALLENGES IN THE PROCESS OF PRODUCING THE IIP

2.1 Present concerns

2.1.1 The IIP with base year 2004-05 is going to complete its third year of run since its inception in June 2011. A number of shortcomings of the IIP data, which are essentially sporadic and reflect inconsistent variation in magnitude, have been noticed from time to time. First of all, a considerable number of commodities of the basket tend to show volatile behaviour in production making the index behave erratically. Statisticians can't do much but to attribute such phenomena to sampling error. Secondly, most of the Government of India organisations, departments or ministries, which supply monthly IIP data suffer from problems of non-response in primary data collection, which may be due to lack of legislative or regulatory control over the production units. In such cases they are left with no option but to estimate the production of the non-responding units. In the absence of trained statistical personnel and clear-cut guidelines, most of the agencies are unable to carry out statistically sound procedures of estimation- the data quality being the obvious casualty as a result. Thirdly, due to low use of modern IT facilities for data collection and considerable reliance on traditional methods using manual returns followed by data entry, there exists considerable amount of non-sampling errors. These errors could be avoided with the adoption of IT based diagnostics. Leveraging technology for modernising the data collection and validation procedures can improve compilation of IIP to a great extent. Rigorous checks such as benchmarking exercises with annual survey data and cross-validation with other sources of data such as Excise collection data from Department of Revenue may be adopted in the new base year for enhancing confidence of the users of IIP data. The issues of non-response, estimation, data validation and other problems associated with source agencies in current series have been discussed in detail in Chapter V.

2.2 Data issues in developing the new framework of the IIP

2.2.1 Reference year or base year data: The ASI data forms the basis for developing the item basket for the IIP and also drawing the weighting diagram. Several issues required special treatments or techniques while dealing with ASI data during the revision process. These issues have been briefly discussed below alongside discussion on the methods followed to resolve the issues or the way they have been dealt with. One important consideration was that of having a reasonably normal year in terms of industrial production as the base year.

(a) Problem of discord in the ASICC and NPCMS classifications

(i). Product level ASI data for the years 2008-09 and 2009-10 has been made use of in drawing item basket and weights pertaining to the year 2009-10. In both these years of ASI, the product descriptions were based on the ASICC. However from ASI 2010-11, data is being collected on the basis of a new product classification viz. the National Product Classification for the Manufacturing Sector[6] (NPCMS). It was felt necessary during the course of discussions in the Working Group that in order to facilitate comparison of product-level data over time and across classification structures, the descriptions of the selected items based on ASICC must be adequately identifiable with NPCMS codes and descriptions. Accordingly, production data of ASI 2008-09 and ASI 2009-10, has been recast using the ASICC and NPCMS concordance, and then studied. Since the classification structure of the ASICC itself has a lot of inherent aberrations, an exercise was carried out to explore the possibility of selecting products on the basis of the NPCMS classification.

(ii). It was observed that there are serious problems in the recast-data with many cases having many-to-many concordance. This type of relationship leads to the original product line being lost and therefore, no assignment of the production possible in the recast data since the original data were collected

[6] National Product Classification for the Manufacturing Sector (NPCMS) is the newly developed more advanced classification structure developed based on the international product classification called Central Product Classification (Version 2.0)

using ASICC codes. Apportioning the quantity and value figures corresponding to one-to-many relationship cases also was hardly possible in a proper way unless there exists a defined proportionality rule for dividing the value and quantity of production corresponding to the original product. The only possible way to do that, which was also resorted to in the recast data, is to distribute the values equally among all the number of NPCMS codes corresponding to one particular ASICC. This method of translating original dataset into a new set could be highly misleading.

(iii). As a result of the concordance problems stated here, those ASICC codes for which no NPCMS code could be identified were classified as 'Not Available' (NA). It was noted that value of such products is quite significant in a number of industry groups, as is evident from **Table 2.1**. The limitation of the newly introduced national product classification arising from its inability to establish a well-defined concordance with the earlier classification may not entirely be attributed to its nomenclature and levels of distribution. **The Working Group felt that efforts should be made to overcome these problems primarily through rationalization of the specificity of product descriptions and placement in appropriate product groups and sub-groups**.

(iv). In view of these problems arising while drawing item basket using the recast data, it was not recommended to draw the items from this dataset. **The Working Group hence decided that the item basket based on ASICC may be drawn first and subsequently the ASICC based basket be translated into an NPCMS based basket using appropriate nomenclature rules.**

Extensive day long interactions were held with Superintendents of the field offices of FOD of NSSO at Bangalore and Nagpur, and some interaction was also carried out in Delhi. These were very helpful in bringing these issues to light and help find an appropriate solution in which the classification and definition issues should be addressed in defining the commodity basket.

Table 2.1

Contribution of "Not Available" (NA's) in some Industry groups

NIC 3-digit	Total GVO (in Rs. lakh) at 3-digit	Total GVO (in Rs. lakh) of NA's at the 3-digit level	Proportion of NA's at the 3-digit level
332	13,186,524	3,874,366	29.38%
264	234,809,156	618,129,67	26.32%
170	422,916,128	64,014,351	15.14%
263	131,035,317	19,349,236	14.77%
120	189,761,953	25,680,405	13.53%
210	983,244,159	107,868,842	10.97%

(b). Problem of Non-specific product descriptions

(i) The WG discussed the issue of how to deal with a product description which as per product classification rule contains the term 'n.e.c.', i.e. it relates to all the products that have not been classified (and codified) separately under its immediate parent group which they belong to. It was then decided that the contribution of that particular product (designated by a 5-digit ASICC) in its particular parent industry group may be distributed over all other products having the first 4 digits in the 5 digit ASICC common with the 'n.e.c.' product. This is done because all products containing 'n.e.c.'s in their ASICC descriptions generally have the last digit as '9' in their codes.

(c). Problem of misclassification of products

(i) In the product level data of the ASI, many products correspond with more than one industry groups (NIC 3-digit level) with varying value-quantity ratios. Most often, these have happened due to the practice of classifying the factories by the NIC code of the major product manufactured in the factory. Subsequently, all products manufactured in that factory are assigned the NIC 5-digit code assigned to the factory. This often leads to placing of a product inaccurately in more than one industry groups. Thus a separate treatment to deal with such cases was required. Two methods to deal with this problem

could be considered. In the first method, the maximum value of the GVOs of all the records of same product (corresponding to a particular ASICC code) as found to be appearing under differing industry-group codes (NIC 3-digit codes) is identified. Industry group code corresponding to the record with maximum GVO value was taken to represent the NIC group of the product and the maximum value (GVO) as the eligible value for selection of the product. In the second method, the aggregate value of the GVOs of all the records having the same product code (ASICC) but different industry group codes was assigned to the industry group code of that record in which the product had the maximum value of all the GVOs of the records of the product in question. The aggregate value here was taken as the eligible value for selection of the product.

(ii) It could be established that the NIC grouping to the code in which the product's maximum value occurs is the most correct industrial grouping of the product since it does not distort the inter-se position of the product within that group in terms of GVO relative to other products classified therein. Thus for selection of the item basket, a product which gets aligned to more than one NIC groups, has been taken in that particular NIC 3-digit group in which it has maximum value of output.

2.3 Resource gap in statistical capacity

2.3.1 In the current series of IIP, problems in ensuring quality and adhering to prescribed standards of data have been encountered at the level of source agencies supplying data for IIP. Source agencies have often attributed this to lack of statistically trained personnel in their concerned units. Absence of required skill-set in performing statistical operations such as compilation, validation, estimation of non-response, directly affects credibility of the statistical outputs.

2.3.2 The management and operations of IIP-related activities in the IIP unit of the Central Statistics Office (CSO) are vested with only four statistical personnel at present. The resource requirements for these activities are often undermined as the intensity of work at individual level and the extent of ancillary work involved are lost sight of. Apart from the regular activities relating to monthly compilation and release of IIP, a large number of activities in respect of preparation of the data for disseminating to various users including international agencies, co-ordination with source agencies, industry associations and various stakeholders in respect of data issues, preparation and co-ordination in respect of datasets on the basis of ASI results, activities related to revision/ updation of classification of industries and products and analytical work for studying deficiencies and shortcomings of existing datasets of ASI and IIP are other activities related to industrial statistics. The unit is not exclusively responsible for IIP related work but has also to carry out various ancillary activities in relation with mainstream industrial statistics (both secondary and primary), apart from service sector statistics and statistics of international trade. It may further be added that a number of additional activities will have to be taken up by the unit on a continuous basis while implementing the recommendations of this WG. The existing manpower of the IIP unit is highly insufficient to cope with the entire range of activities described above.

2.3.3 In light of the above facts, **the WG strongly recommends immediate strengthening of the IIP unit of CSO as well as that of the concerned statistical units in the administrative agencies providing IIP data,** for efficiently carrying out the tasks expected of them. It is also recommended that the augmentation of manpower resources and infrastructural facilities has to be commensurate with the capacity enhancement in adopting advanced technologies for data collection, validation and processing envisaged in Chapter V of this report.

CHAPTER III

CONCEPTUAL FOUNDATIONS

3.1 Statistical unit

A statistical unit is an entity about which information is sought and for which statistics are ultimately compiled. The International Recommendations on IIP (IRIIP), 2010, of the United Nations Statistics Division, mentions *establishment*[7] as the statistical unit for the purposes of compiling an IIP because it is the most detailed unit for which the range of data required is normally available. The data gathered, in order to be analytically useful in an IIP context, need to be grouped according to such characteristics as kind of activity, geographical area and size, and this is facilitated by the use of the establishment unit. As is the current practice, the elementary statistical units for collection of data may continue to be establishments only, i.e. factories, mills etc., in the revised series.

3.2 Index

An index is a composite number used to indicate change in magnitude (as of price or quantity) as compared with the magnitude at some specified time usually taken as 100. The IIP as an index number, like most of other indices in use for measuring change of a given parametric quantity which is composed of a number of sub-component changes, is a weighted average of the relative changes of the sub-components (e.g. product-level output for IIP). The relatives are proportions with current period quantity over a base period quantity.

[7] An establishment is defined as an enterprise (an economic transactor with autonomy in respect of financial and investment decision-making) or part of an enterprise that is situated in a single location and in which only a single productive activity is carried out or in which the principal productive activity accounts for most of the value added.

3.3 Base period

Base period or reference period is a point in time used as a reference point for comparison with other periods. It is generally used as a benchmark for measuring financial or economic data. The base period is required to be a normal period which satisfies certain characteristics. It can be a fixed period such as a particular year or may be a movable one that jumps from one period to the next.

3.4 Scope & Frequency

3.4.1 The scope for Index of Industrial Production (IIP) as defined in IRIIP is in terms of ISIC Rev. 4, i.e. the scope of the industrial sector is defined to cover section B (mining and quarrying), section C (manufacturing), section D (electricity, gas steam and air conditioning supply) and section E (water collection, treatment and supply, sewerage, waste collection and remediation activities). This reflects a change from the original 1950 scope which included Mining & Quarrying, Manufacturing, Electricity and Gas.

3.4.2 Since in the Indian context, IIP is intended to capture the trend/ movement of industrial production in the country and not the absolute value of industrial production, the current practice of covering electricity generation excluding distribution and transmission should suffice for some time more. There is a real void in data for gas, steam supply and air conditioning, water supply, sewerage, waste management and remediation. Identifying different data sources and establishing appropriate system for data collection for covering water supply, etc. need to be explored first. For this, studies may be taken up by a dedicated unit to be established in ESD, CSO.

3.4.3 In view of above, **Working Group recommends that status quo be maintained for defining the scope of all India IIP to cover (i) Mining (ii)**

Manufacturing and (iii) Electricity. Since the data on captive power generation in total electricity generated comes at a lag of almost two years, the same cannot be taken into account for compilation of monthly index of electricity. Similarly, for compilation of index of mining sector, minor minerals shall have to remain outside the scope since they fall in the domain of State subject and collection of data on the same does not fall under the purview of Indian Bureau of Mines (IBM), which supplies the data for mining.

3.4.4 The scope of data collection for IIP in the new series will be limited to factories in the organized manufacturing sector as per the framework defined in para 3.10.2 and may not be extended to cover the unorganized manufacturing, which by its sheer size defeats the capacity and resources to produce estimates based on any quick survey. Thus the all India IIP compilation, as envisaged by the Working Group, will depict the characteristics of the organized manufacturing sector only. It is further recommended that once the Ministry of Micro, Small and Medium Enterprises (M/o MSME) comes out with a separate index for the MSME sector in accordance with the recommendation[8] of the Committee of Secretaries (CoS), the CSO may consider how the MSME index could suitably be dovetailed with the new IIP only once the IIP-MSME series becomes stable.

3.4.5 With regard to the frequency of compilation of the IIP, as recommended in IRIIP, the **existing system of bringing out IIP on monthly basis may continue** so that turning points in economic development can be indicated at the earliest possible point in time.

[8] The Committee of Secretaries (CoS), in its meeting held on 10th May 2011, recommended- *"MSPI will consider the suggestions made by the Ministries/ Departments for further improving the coverage of the unorganized sector and updating the samples, at the time of next base revision of the IIP."*

3.5 Classification

3.5.1 UNSD recommends that the international reference classification for economic activities- the International Standard Industrial Classification (ISIC) Rev.4 is the common standard classification of industries for international comparability of industry specific IIP and the Central Product Classification (CPC) Ver.2 be used to assign IIP measures to product groups.

3.5.2 National Industrial Classification (NIC)-2004, which was based on ISIC Rev. 3.1, has been used in the classification of industries for IIP in the existing series with base year (2004-05). **NIC-2008, based on ISIC Rev. 4, may be used for the new series.**

3.5.3 For ASI 2009-10 which forms base data for our revision exercise, ASICC was used as product classification. However, since 2010-11, NPCMS based on CPC version 2 has been implemented as the product classification for ASI. Accordingly, as discussed earlier, the products drawn on the basis of ASICC in 2009-10 have been recast in terms of NPCMS. This is in keeping with international recommendations and also future continuity.

3.5.4 While the Working Group recommended continuing with the current sectoral classification of Mining, Manufacturing and Electricity, it was pointed out by members of the Working Group that there exists overlap in terms of definitions and categorisation of items in the current item basket as per the existing use-based classification. The definitional ambiguity was most glaring in the category of Basic and Intermediate goods. Hence it was suggested that the use-based classification be re-categorised in the following manner for the purpose of dissemination of indices in the new series and the class “Basic” goods be removed:

i. Primary Goods;

ii. Intermediate Goods;

iii. Capital Goods; and

iv. Consumer Goods (Durables and Non-durables).

To characterize the proposed Use-Based Classification in respect of items that are likely to feature in each of the categories, indicative descriptions of each of the categories are provided below:

i. **Primary goods**: Within the scope of economic activities taken into account for the construction of IIP, only such goods as are directly obtained from natural sources and used for further processing and consumption in manufacturing and power-generating activities, will qualify as primary goods. In the new series of IIP, only mineral products will qualify as primary goods.

ii. **Intermediate goods**: This category will comprise all types of manufactured goods as distinguished from primary goods, which are referred to as basic and intermediate goods in the current series. In essence, they represent goods used as inputs in the production of other goods, such as partly finished goods and goods used in production of final goods.

iii. **Capital goods**: These will include manufactured goods, other than intermediate goods, which are used in the production of other goods or services (but not as inputs). Typically, capital goods are tangible assets which are then used for the means of production, e.g. plant and machinery. The conventional way to look at Capital Goods is from the perspective of them being machinery. However, a considerable part of fixed asset creation is based on construction which uses steel, cement and other material. The question was raised that since in the NAS gross domestic fixed capital formation includes construction, should construction related goods – primarily construction steel and cement – not be included in Capital Goods? Following discussion it was felt that while there is some merit to this argument, on balance it would be

preferable to continue to define capital goods as machinery & equipment including parts and components thereof.

iv. **Consumer goods**: Distinction must be made between capital goods and goods for consumption, as the aim of the latter is not further production of goods or services. By consumer goods, we imply all that is produced and subsequently consumed to satisfy current wants or needs. Consumer goods can be further classified as durable/ non-durable depending on life span of the same. While Consumer Durable Goods will include goods with a significant life span (generally more than a year), Consumer Non-Durable Goods will be the ones that are for the immediate use of the consumer. To illustrate, while consumer durables will include household goods (e.g. home appliances, consumer electronics, furniture, etc.), the latter will include food articles, beverages, clothing and shoes.

3.6 Commodity Basket

3.6.1 The term commodity basket refers to a fixed list of items used specifically to track the changes in prices or volume of production in one period compared to a reference period in an economy or market. The earliest approach to index number theory was the fixed basket approach pioneered by Joseph Lowe [1] in the context of the calculation of bilateral price indices. In this approach, an approximate product basket was constructed that represented the purchases made during the two periods under consideration (periods 0 and t), and then the level of prices in period t relative to period 0 was expressed with the help of the ratio of the period t cost of the basket to the period 0 cost of the basket. In principle, any set of goods and services could serve as the reference 'basket' and it does not have to be restricted to the basket actually produced in one or other of the two periods compared.

3.6.2 For practical reasons, the basket of prices/quantities is based on surveys conducted for a reference period earlier than either of the two periods whose prices/quantities are compared (that is for a period b with $b \leq 0 \leq t$). Because it takes a long time to collect and process survey data (e.g. revenue data), there is usually a

large time lag before such data can be introduced into the calculation of the index. This is always the case when the index is first published. The procedure for selection of the IIP basket of commodities in the revised base year is placed at Chapter IV.

3.7 Weight

Value of output is recommended as the weight variable to compile the IIP at the product and product group levels of the index and Gross value added at basic prices data is recommended as the weight variable to compile the IIP for the different levels of the ISIC structure in IRIIP. Product group weights should be updated at least every 5 years. 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 weighting procedure adopted for the revised base year is in accordance with IRIIP recommendation and is detailed in Chapter IV.

3.8 Formula

3.8.1 The IRIIP, 2010 states that:

> "All index types possess characteristics that make each of them more or less desirable in certain circumstances. The Fisher's index for example, possesses several theoretically desirable characteristics (like factor reversal and time reversal) but is considered difficult to produce in a timely and cost effective manner due to its use of the Paasche's index, for which, current information on price and quantity may not be readily available). On the other hand, the Laspeyres' type index can be produced in a timely and cost effective manner and benefits from taking practical compilation constraints into consideration. However, the main theoretical concern with both Laspeyres' and Paasche's indices is that the weights are not a symmetric average of current and reference period price and quantity information. There is a further concern, based on the economic theory outlined, for the need to update the weights and

then have a chained series of superlative indices. The ultimate aim would be to end up with an index that incorporates all the available historical information (path dependent) to track the dynamic changes in industrial production. In summary, the selection of the index type to be used to compile the IIP should take into consideration:

- The purpose of the index (to provide a short-term indicator of production and, where required, for use in the compilation of the QNA);
- Theoretical considerations (i.e. including an up-to-date weighting structure, time and factor reversal, etc.); and
- Practical considerations (i.e. what can be practically achieved due to resource constraints and data availability).

An overall assessment of both theoretical and practical issues has resulted in the Laspeyres'-type volume index being widely used by national statistical agencies."

In accordance with the rationale provided in IRIIP, in our case as well, the Laspeyres' type index formula is recommended for compilation of the IIP, all the more for reason of its simplicity from calculation point of view and ease of interpretation. **The same is recommended in the revised base year.**

3.8.2 Laspeyres' fixed-base formula is expressed mathematically as follows:

$$L_t = \frac{\sum R_i W_{i0}}{\sum W_{i0}} * 100$$

Where

W_{i0}= Weight of the i^{th} item in the base year

R_i= Production relative of the i^{th} item= P_{it}/P_{io}

P_{it} = Production of the i^{th} item in the period t

P_{i0}= Production of the i^{th} item in the base period

3.9 Price Deflators

3.9.1 The term producer's price is defined as the price receivable by the producer from the purchaser for one 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 Producer Price Index (PPI) thus measures the average change in ex-factory prices of output or producer's prices. It is recommended in IRIIP for use when monetary values at current prices are deflated to compile volume measures of output for the IIP. It is also recommended that the price deflator[9] 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.

3.9.2 In India, PPI has not been introduced so far in the national system. Hence, the **Wholesale Price Index (WPI)[10] will be used as deflator as in the past series**. It was suggested to use 'preferred'[11] methods mentioned in IRIIP 2010 for as many items as possible in the newly drawn item basket. **It was also decided to synchronize the item baskets of WPI and IIP so as to have the best possible mapping resulting in availability of appropriate deflator for each item group in the new series**. It has now been recommended that the WPI will not include Central Excise Duty or indeed any State or Central Taxes, which brings it in terms of concept, closer to the Producer Prices. This will make the process of deflation of current price based value of output data more robust.

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9 Since the IIP is a measure of change in volume of production, irrespective of change in price, the effect of change in prices is eliminated where volume measure of output is worked out on the basis of monetary value. This is done by dividing the monetary value of a product by a suitable price index. This process is called price deflation and the price index used for the purpose of deflation is known as price deflator.

10 The Wholesale Price Index or WPI is "the price of a representative basket of wholesale goods" used as one of the measures of inflation in India. It is brought out by the Office of Economic Adviser, Ministry of Commerce and Industry. The price of a good sold by a wholesaler is somewhat higher than what he paid to the producer of the good (producer's price) and the wholesale price is artificially constructed for WPI by adding excise duty paid on a good to its producer's price.

11 The IRIIP has defined the preferred variables list to be used for each of the 2 digit industry classification in the document IRIIP, 2010 (Part II-Pp 142- 224)

3.9.3 According to the UNSD guidelines, it is also 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. **The current practice of using the deflator at the item group level (i.e. the most disaggregated level) may be continued.**

3.10 Frame of factories

3.10.1 Ideally, a National Business Register (BR) should be used as the frame for factory selection for IIP as per UNSD guidelines. Since no BR exists in India for the national statistical system to fall back upon, ASI frame of factories would be the best possible alternative to start with for construction of a frame for the selection of factories for the new series of IIP.

3.10.2 The ASI frame covers factories registered under the Factories Act, 1948, whose list is maintained by the state's Chief Inspector of Factories (CIF). However, it has always been pointed out that ASI frame is not complete. Also, it has been found that for some of the source agencies supplying data for compilation of IIP in the current series, the list of factories contain a significant number of units which are not covered in ASI. **Thus, in the revised base year, it is recommended to use the frame available with the ASI and supplement it adequately with the list of factories available from the different source agencies, and the relevant frame of private manufacturers registered with the Ministry of Corporate Affairs under the Companies Act, 1956**. It may also be kept in view that no large unit from the 6th Economic Census Directory is missed out, while finalizing the frame.

3.11 Source Agency

It is recommended in IRIIP 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. In India, Administrative

sources, to the maximum possible extent, are utilized currently, as per the UNSD guidelines. There is hardly any scope to make a departure from this practice and we have reason to maintaining a sampling frame based on administrative sources, and so is also envisaged for the new series.

CHAPTER IV

METHODOLOGICAL FRAMEWORK

4.1 Measuring Industrial Production

4.1.1 The additional value created by the process of production, known as *value added* is the basis for various estimates of National Accounts Statistics. Value added can be measured either in gross or net terms, that is, before or after deducting consumption of fixed capital:

i. Gross Value Added (GVA) is the value of output less the value of intermediate consumption, such as materials and purchased business services;

ii. Net Value Added (NVA) is the value of output less the values of both intermediate consumption and consumption of fixed capital.

4.1.2 The theoretical aim of the IIP is to reflect the volume developments in value added over time. However, this ideal approach to measuring value added at high frequency is difficult to achieve in practice because the necessary data, in particular to calculate intermediate consumption, are generally not available at the required detail and/ or frequency. Therefore the challenge in compilation of IIP is to obtain the most readily available data that provides the best approximate of short term movements in value added.

4.1.3 In India, approaches to approximate short-term movements in value added for the industrial sector have been developed given the measurement difficulties with the ideal approach. These approximation approaches require the measurement of outputs and inputs of the production process to obtain a proxy volume measure of industrial production. Specifically, output approach by including physical output quantities and values of output is found to be most appropriate as it is not farfetched to assume a fixed relationship between the variable being measured and value added. Thus**, the**

output approach utilized so far for compilation of IIP by making use of the unit level data of Gross Value of Output (GVO) may continue.

4.1.4 In the output approach followed in India, volume estimate is obtained from output in monetary terms at current price value via a process of price deflation. The current price value is *deflated* by the use of a price index (Wholesale Price Index in case of India) in order to obtain the volume measure. Change over time of the volume measure is referred to as *volume change*. The presentation of industrial production volume data in monetary terms does have some advantages. It takes care of the changes that take place in the intervening period in the nature of a particular product in terms of quality, technological improvement, range of specifications, etc. This also takes care of the problem of non-additivity of different grades of a particular product which are quantified in terms of different units of quantity. In view of this advantage, there is considerable merit in following a dual approach in calculating volume change by both price deflation method and direct quantity relative method.

4.1.5 There is a strong argument to move completely to the use of volume estimate of output instead of the hybrid approach outlined above. Efforts have been initiated by the Government of India to have a Producers' Price Index (PPI) in place. PPI is supposed to take into account the ex-factory price (excluding taxes and distribution cost) of a product. At the time of selection of item basket for the PPI, an exact convergence with IIP item basket may be achieved. This exact convergence is necessary to ensure higher reliability of the volume estimate derived from the monetary value of an item at current price by deflating it with corresponding PPI. In the absence of PPI, practice of using WPI for deflating the output value for some items in the item basket of IIP cannot be extended to the entire basket as there is no one-to-one convergence between IIP and WPI item baskets. However once PPI becomes available, the issue of switching over to an entirely volume based index may be decided upon. **Thus till the time we have a stable and regular PPI put in place, the hybrid method of using a mix of physical output quantities and value of output (deflated using WPI) has to continue.** It is contingent upon the fact that WPI

basket of commodities being based on pricing of commodities that move to wholesale market, cannot exactly align with those produced for various uses and considered for IIP even as far as the manufacturing sector is concerned. While the WPI has so far included the Central Excise Duty (CED) in the price taken for incorporation in the index for manufactured goods, the Working Group for WPI has recommended that CED or any similar tax should not be included in the reported price. While as of now there may be a mismatch between the ex-factory value (which is the value to be deflated) and the deflator, if the recommendations regarding WPI are implemented, the mismatch will be resolved. In any case, till the PPI becomes available in India, the only viable deflator is the WPI. In this situation, care has been taken to **align the new WPI item basket with the new proposed IIP basket, whose data will be collected in value terms, so that no mismatches occur when WPI will be used to deflate value of production of the corresponding items in the IIP basket.**

4.1.6 For items such as heavy machinery, capital goods, etc. the production time of one complete unit often exceeds one month's time, hence the monthly reporting of production of such items in terms of physical quantity is hardly possible nor are recorded by the manufacturers. If they report the production in physical quantity of completed units and show it for any particular month in which they are completed, there will be sharp intermittent peaks in the reporting cycle with levelled flats in between. **It is therefore recommended that value of 'Operating Work in Progress' should be collected/ reported for such items in order to avoid spikes in reporting of these items and reduce volatility**. Operating Work in progress/ value of production of capital goods will be denoted by the expression "Value of Net Sales of Finished Goods" + ["Closing stock of work-in-progress (i.e. goods under manufacture)" – "Opening stock of work-in-progress"] + ["Closing inventory of unsold Finished Goods" – "Opening Stock of unsold Finished Goods"].

4.1.7 **It is also recommended that appropriate instructions/ guidelines be prepared by CSO in consultation with DIPP taking into account the production**

features of such capital goods items and issued to the producing units concerned, for providing monthly 'work in progress' values for capital goods.

4.2 Selection of Base Year

4.2.1 The selection of base year for an index is the most important part before setting out on determining other procedural aspects. A base year must be a normal year which must not be an abnormal period since it acts as a reference point. Especially in a fixed basket, fixed weight approach, as is ours, the base year becomes very important as the basket of items and the weighting diagram are specific to the reference frame of the base year only.

4.2.2 UNSD recommends that a fixed weight index must be revised every five years to reflect the changes in the reference frame. A Working Group to suggest revision of base year of all India IIP and methodological aspects for constructing chain base index was set up under the Chairmanship of Dr. R. Nagaraj, Professor, IGIDR, Mumbai, in August 2011 by the Standing Committee of Industrial Statistics (SCIS). This Working Group suggested that 2009-10 is an appropriate reference year for shifting the current base year to. Given the fact that more up-to-date ASI data were not available at the time when the process of revising the IIP framework started, the Working Group on IIP accepted the suggestion of the Dr. Nagaraj- working group and decided that necessary exercises for forwarding the current base of 2004-05 to 2009-10 be taken up for the WG to progress to appropriate conclusion in the end.

4.2.3 However, CSO has decided, on the basis of the findings of the NSS 68th round, to move forward the base year for National Accounts Statistics to 2011-12. Also, for the WPI revised series under construction, 2011-12 is proposed to be adopted as the new base year. For the reason of interdependence on one-another, the base year of IIP should be the same as that of these other two important macroeconomic aggregates. It was **recognized by the Working Group that the base revision related exercises for**

making 2009-10 the base year have to be effectively utilised for transition of the base year to 2011-12.

4.2.4 The Working Group was of the view that since 2011-12 is a more desirable base year than 2009-10 in view of its proximity to the current year, and since we have already made considerable progress in terms of the work required for base revision, it is advisable to adequately adjust the proposed set of items and their weights taking into account 2011-12 ASI data, as soon as the same becomes available. It was also observed that though there will be slight changes in the list of significant items and also their shares in 2011-12 compared to 2009-10, the changes may be suitably addressed by CSO and vetted by a Technical Review Committee as proposed later in this report, keeping in mind the methodology followed for 2009-10.

4.3 Selection of Commodities

4.3.1 Our industrial output data is characterized by high degree of fluctuations in the product level output data. Such fluctuations are exhibited by the ASI also and tend to be more pronounced whenever there is a change in the product or industry classification. Thus it is quite appropriate to believe that a reasonably better representation of items could be possible if the item basket selection is done on the basis of more than one years' production data. Accordingly, **the suggestion of the SG-II that a list of common products be identified from the item baskets drawn using the ASI 2008-09 and the ASI 2009-10 data[12] to arrive at a shorter and more stable list of products with lesser volatility year-on-year is considered most desirable in the current circumstances.**

4.3.2 To increase the representativeness to the maximum extent, the individual item basket drawn by selecting all those products contributing at least 90% to the total

[12] An attempt to take into account the ASI data for three years, i.e., 2007-08, 2008-09 and 2009-10 turned futile since the ASI data for 2007-08 was based on the NIC 2004 and the ASI data for the next two years used the NIC 2008 classification, for which necessary concordance at industry group (3-digit NIC) level could not be established.

Box 1: Selection of Commodities for the 2004-05 IIP basket

Manufacturing sector: For manufacturing sector, the results of ASI, 2004-05 was used to identify the items to be included in the item basket for 2004-05. All those products that contributed 0.20% or more to the total value of production at 2-digit industry of NIC-2004 were considered for inclusion in the Item basket. Applying this criterion, a total of 1038 items qualified for the Provisional Item Basket (PIB), which accounted for more than 80% of GVO of manufacturing sector at all-India level. Relevant items from PIB along with the list of units/factories received from the ASI-2004-05 database were sent to the concerned Source Agencies for their feedback and finalization of their respective item basket. Finally 620 items were included in the item basket after due consultation with the source agencies, which were further clubbed into 397 item groups for reporting purposes.

Mining sector: Sixty one (61) items were identified by the Indian Bureau of Mines (IBM) for the Index of production of Mining sector. The IBM provides the index relating to Mining sector, which is used along with the manufacturing and electricity sector indices to arrive at the General Index of Industrial Production.

Electricity sector: The Electricity sector consists of a single item to take into account only 'the total electricity generated' in the country. The information is taken from the website of Central Electricity Authority (www.cea.nic.in) under the Ministry of Power.

GVO at the NIC 3-digit level were found to be most suitable. The common products thus obtained from the convergence of the item baskets drawn using 90% criterion, were actually found to have 80% or more representativeness at 3 digit levels of NIC in most of the cases, while marginal shortfalls in 80% level of representativeness were observed for a few industry groups. This shortfall can be bridged by addition of a few products from 2009-10 datasets.

4.3.3 In view of the above, similar exercises of using data of more than one year seem to be unavoidable whenever a new basket of commodities is to be identified. Thus when the selection of item basket for the proposed base year of 2011-12 would follow as an extension of the process followed for 2009-10 base year, the output of

the products in 2010-11 can also be taken into account apart from 2011-12 in the manner described in paragraph 4.3.4. This is a major improvement over the procedure followed for 2004-05 IIP basket (see box 1) and contributed to a more inclusive basket obtained for 2009-10 base year.

4.3.4 Manufacturing Sector

(a) After considering results of various exercises carried out with the ASI datasets and all the suggestions/ recommendations of the relevant sub-groups and the WG, the following methodology has been adopted for drawing the final item basket for the manufacturing sector for the new base year 2009-10:

i. Using the ASI 2008-09 and 2009-10 data, all unique descriptions for 5-digit ASICC codes occurring in a year were picked up and listed out.

ii. Each product was placed in alignment with a particular industry group (NIC 3-digit level) in which the particular product's maximum GVO occurred.

iii. From the list stated above, the product descriptions at the 5-digit level of the ASICC corresponding to not-elsewhere-classified products (n.e.c.'s) were removed and the contributions of all such products in a particular industry group were re-distributed among the 'n.e.c.' product.

iv. The list of products thus obtained was arranged in descending order of value of output within each 3-digit level of NIC and then starting from the highest contributor, all the products were selected till total value of output of the selected products becomes at least 90% of the total value of output at each 3-digit level.

v. In this manner, two separate item baskets were selected for the years 2008-09 and 2009-10 comprising 1204 and 1142 products respectively.

vi. To obtain a final list of products which are less likely to be affected by high year-on-year fluctuations in production data, a list of 676 common products from both the item baskets for 2008-09 and 2009-10

was found out for which the product descriptions as well as industry groups matched.

vii. Since the representativeness for these 676 products was found to be less than 80% for certain industry groups, the list of products in all such industry groups was augmented by additional products from the 2009-10 item basket to make the representation at least 80% of the total GVO at each NIC 3-digit level.

viii. In this manner, a final list of 809 products was obtained which is proposed to constitute the item basket for the new base year.

ix. Finally with the help of a concordance between the newly selected products having ASICC and the new product classification NPCMS, a final list of products based on NPCMS was obtained.

x. Items thus selected were re-grouped into 521 item groups

xi. The new item basket has been compared with the existing item basket (base 2004-05) to identify the extent of products that have become less relevant during the interim period. Products having about 9% of the weight in the existing item basket for base 2004-05 are found to have lost relevance as per ASI data and hence dropped (Refer **Table 4.1**). The 2-digit NIC-wise distribution of weights of phased out products from the previous item basket is at **Annexure III.**

(b) **The WG recommends adoption of the methodology used for drawing the item basket for the manufacturing sector with base year 2009-10, in the revised series of IIP.** (The selected item basket is at Annexure II).

Table 4.1

A summary of the item basket chosen for the base year 2009-10

Parameters	**Number**	**Weight (in IB '04-05) [Out of total wt. for Mfg. sector - 75.52%]**
Total number of products in the proposed item basket with base 2009-10	809	Not Applicable
Number of products common between 2008-09 and 2009-10	676	Not Applicable
Number of common products from previous basket	463	66.44%
Number of dropped products from the previous basket (out of 620 items in IB 2004-05)	157	9.08%

(c) Also, for reasons already mentioned in paragraphs 4.2.3 – 4.2.4, the set of items drawn on the basis of ASI 2009-10 will have to be adjusted taking into account new important items and the distribution of significant items within NIC 3-digit groups in ASI 2011-12 data. The WG envisages that only incremental changes will be necessary to the already drafted item basket for 2009-10 for arriving at the item basket for 2011-12. Such changes may be carried out at CSO and vetted by the Technical Review Committee to be constituted as proposed by the WG.

(d) <u>Rationale for departing from older methodology of selection of the item basket:</u>

i. Representativeness of industries by their categories and sectoral affiliation is an important consideration of the selection method. For this the Industrial Classification is the proper recourse to follow as ASI data is available as per National Industrial Classification. Accordingly, the method of selecting products contributing at least 0.20% to the total GVO at the NIC 2-digit level was followed for the 2004-05 series of IIP. This method leads to under representation of industries at levels lower than NIC 2 digit level. It is appropriate to have at least 80%

GVO coverage at 3 digit levels of NIC in order to ensure meaningful use of the indices at lower levels of industrial classification.

ii. Products when selected with their aggregate value of output contributing to at least 80% of the total value of output at the corresponding 2-digit level of NIC demonstrated that the representativeness of the item basket at lower levels of NIC (3 digit and below) decrease considerably.

iii. Contrary to the problem stated at (ii) above, an item basket drawn up with the aggregate value of output of the products under corresponding 3-digit level of NIC contributing at least 80% of the total value of output at 3-digit level improves representativeness to a large extent as **Table 4.2** reveals.

Table 4.2
Contribution of products selected in item baskets drawn at NIC 2 and 3 digit levels for selected NIC 3 digits

NIC 3 digit	%age contribution	
	Case I*	Case II**
192	0.00%	82.60%
252	0.00%	92.64%
231	27.80%	82.04%
274	33.52%	80.35%
293	45.78%	80.06%
139	45.97%	80.34%
301	51.05%	94.22%
292	54.03%	80.35%
261	59.12%	82.31%
242	61.94%	81.24%
259	62.43%	80.34%
106	63.07%	80.62%

* Item basket drawn with at least 80% contribution at NIC 2-digit level
** Item basket drawn with at least 80% contribution at NIC 3-digit level

iv. The items selected by taking unique descriptions and assigning them to the NIC 3-digit where they had maximum value, helps us to deal with the issue of misclassification of products.

v. Removal of 'n.e.c.' and other products with non-specific descriptions and redistribution of their values makes the items in item basket specific in description.

vi. Taking common set of items from two years to deal with the problem of year-on-year volatility, inherent in ASI data helps in choosing a stable set of items for the new base year.

(e) The WG also recommended that while selecting items with 2011-12 results in view, feedback of source agencies may be obtained and their suggestions be taken on board. However, it may be borne in mind that since items having significant GVO shares have already been considered in the item basket, it may not be possible to include all items suggested by the sources. For, including insignificant items in the item basket may lead to high non-response and large fluctuations. Keeping the above in mind while finalizing the item basket for 2011-12, CSO may include only significant items from the sources' list, if missed out in the drafted item basket. The weights of such items may be derived using item level production data of the sources.

(f) On the issue of emerging and new products to be included during the course of a base year, the Working Group recommended that a mechanism such as a Technical Review Committee should be created at CSO to review the product list from time to time and to decide on the methodology for including deserving items in the existing basket.

4.3.5 Mining Sector

4.3.5.1 In the existing method of compilation of IIP at the CSO, the mining sector index as independently calculated by the IBM is used as it is. The item basket for mining sector is decided by IBM in consultation with the CSO. The mineral products fall under the industrial classification 2 digit codes (divisions) of 05 to 08. The IBM decides the weights of each of these NIC divisions according to their individual share in the total value of production of the 4 divisions taken together. The

selection of minerals under each of these divisions individually is based on maximum share of products in the respective divisions. Following the same practice, which was also endorsed by the CSO, the IBM presented an item basket for minerals consisting of 55 products (4 fuel minerals, 9 metallic minerals, 42 non-metallic minerals). Due to non-availability of data for minor minerals, the IBM did not include the same in the new item basket. Item basket for minerals is placed at **Annexure IV**.

4.3.5.2 The Working Group has accepted the item basket prepared by the IBM with minor modifications. The distribution of their GVO contributions has been found acceptable for the purpose of the revised series of IIP. While shifting the base to 2011-12, IBM will provide CSO with an adjusted basket of mineral items considering the changes that would take place in the interim period in terms of distribution and product composition of mineral items within the 2 digit NIC groups concerned.

4.3.6 Electricity Sector

4.3.6.1 In the series of IIP with 2004-05 as base year, there was no decomposition by electricity products in the item basket for the purpose of working out the electricity index of the IIP. Although data of generation by sector (thermal/hydro/nuclear/renewable sources) is available on a monthly basis, there is no real advantage of compiling disaggregated indices of electricity generation by sector unless there is specific use of the same in the context of national accounts estimates or for policy purposes. As the Working Group has not come across any such demand from any quarters to justify requirement of disaggregated indices of electricity by sector, it was decided to continue treating electricity as a single product.

4.3.6.2 The Working Group also discussed the possibility of including captive power generation in the Electricity production. However since the data for the former

is available with a lag of two years, it is not feasible to include the same in monthly compilation of IIP.

4.3.6.3 **The Working Group recommends treatment of electricity as a single product for the item basket of the IIP new series as was the practice in the earlier series, too. A product-level-index for electricity may therefore serve as the sectoral index as well.**

4.4 Weighting Diagram

4.4.1 The International Recommendations in Index of Industrial Production (IRIIP), 2010, brought out by UNSD, recommends the following with respect to the methodology for deriving the weighting diagram at different levels:

> "Value of output is recommended as the weight variable to compile the IIP at the product and product group levels of the index. Gross value added at basic prices data is recommended as the weight variable to compile the IIP for the different levels of the ISIC structure."

4.4.2 The IRIIP also states that

> "While it could therefore also be desirable to use a value added-type concept at all levels of the IIP aggregation, this is limited by theoretical and practical circumstances. The concept of value added is applicable only to activities (and therefore industries), but not to products. In addition, detailed data that could be used to approximate such a concept are often not available in the frequency or timeliness required for the IIP compilation. Value added should be used for the aggregation of the IIP from the lowest level at which it is available, i.e. typically starting from the 4-digit level of ISIC".

4.4.3 Keeping in view the above, the weighting diagram for the new series of IIP with base 2009-10 has been drawn up based on the methodology used in the current series where the sectoral weights i.e. for the Mining, Manufacturing and Electricity sectors, were derived using the respective GVA figures for each of the sectors from the National Accounts Statistics. The weight thus found for the manufacturing sector was then allocated amongst the National Industrial Classification (NIC) 2-digit codes in proportion to the total GVA of each of the NIC-2 digit codes based on the total contribution of registered manufacturing sector, as per the GVA figures taken from Annual Survey of Industries (2009-10).

4.4.4 The methodology for weighting diagram as recommended by Working Group is detailed as under:

i. **Sectoral weight**: Weight for Mining, Manufacturing and Electricity sectors were arrived at on the basis of their percentage share in GDP at factor cost in 2009-10

ii. **Weights at 2-digit level**: The weight of manufacturing sector distributed in proportion to the total GVA of NIC 2-digit industrial codes from ASI (2009-10) for registered manufacturing sector

iii. **Weights at 3/4 digit level**: 2 digit weights distributed to 3 or 4 digit levels in steps in proportion to their respective GVA figures at all India as per ASI 2009-10

iv. **Weights at product/item group level**: Finally 4 digit level weights distributed to selected products/item groups in proportion to their GVO contribution in their respective 4 digits as per ASI 2009-10.

4.4.5 The product level weights, as in the current series with base 2004-05, will be assigned on the basis of GVO figures from ASI for 2009-10. As has been observed in the current series, there are several instances where perturbations in the production

figures for a single item have caused huge fluctuations in the overall index, leading to erroneous interpretations. **The Working Group recommended using the average of product-level GVO figures from ASI for 2008-09 and 2009-10**, since:

i. The item basket for the new series of IIP with base 2009-10 has already been selected considering the common items occurring in both the item baskets drawn separately for 2008-09 and 2009-10.

ii. This methodology would also take care of assigning appropriate weights in order to stabilize high fluctuations in the new series. If an item occurs only in 2009-10 and is selected in the final item basket mainly to reach the 80% level of representativeness of items at the NIC 3-digit level, then all such items would automatically be assigned lower weights on account of their occurring only in 2009-10 and not in 2008-09 (since GVO figure for item not occurring in 2008-09 will be taken as zero).

4.4.6 The weighting diagram at 2-3-4 digit levels of NIC is at **Annexure X**. The weights drawn from 2009-10 ASI data will be adjusted on the basis of 2011-12 data as per methodology prescribed above. In the process however, the change in the weighting at broader levels of industrial grouping needs to be kept in view. A comparative table of weights at 2-digit level of NIC 2004 is provided in **Table 4.3** for the years 2004-05, 2009-10 (based on ASI 2009-10) and 2011-12 and a comparative table of weights at 2-digit level of NIC 2008 for the years 2009-10, 2010-11 and 2011-12 is at **Table 4.4.**

Table 4.3

Comparison of weights of NIC 2 digit industry groups under manufacturing sector across years:

Comparative Table of Weights in 2004-05, 2009-10 and 2011-12 by NIC 2004

Industry 2 digit (NIC 2004)	2004-05	2009-10	2011-12
Food products and beverages	7.28	6.24	7.14
Tobacco products	1.57	0.90	0.90
Textiles	6.16	4.23	3.71
Wearing apparel; dressing and dyeing of fur	2.78	1.62	1.49
Luggage, handbags, saddlery, harness & footwear; tanning and dressing of leather products	0.58	0.64	0.57
Wood and products of wood & cork except furniture; articles of straw & plating materials	1.05	0.18	0.22
Paper and paper products	1.00	0.91	0.98
Publishing, printing & reproduction of recorded media	1.08	0.74	0.77
Refined petroleum products, nuclear fuel & Coke	6.72	8.47	5.69
Chemicals and chemical products	10.06	12.37	14.48
Rubber and plastics products	2.02	2.99	2.73
Other non-metallic mineral products	4.31	5.55	4.60
Basic metals	11.34	10.89	14.43
Fabricated metal products, except machinery & equipment	3.08	3.08	3.00
Machinery and equipment n.e.c.	3.76	5.33	5.37
Office, accounting & computing machinery	0.31	1.28	0.88
Electrical machinery & apparatus n.e.c.	1.98	2.52	2.25
Radio, TV and communication equipment & apparatus	0.99	1.26	1.13
Medical, precision & optical instruments, watches and clocks	0.57	1.28	0.88
Motor vehicles, trailers & semi-trailers	4.06	5.19	5.47
Other transport equipment	1.82	2.28	2.00
Furniture; manufacturing n.e.c.	3.00	1.20	1.21
Total	**75.53**	**79.18**	**79.90**

Table 4.4

Comparison of weights of NIC 2 digit industry groups under manufacturing sector across years:

Comparative Table of Weights in 2004-05, 2009-10 and 2011-12 by NIC 2008

Industry 2 digit (NIC 2008)	2009-10	2010-11	2011-12
Food products	5.21	5.72	5.97
Beverages	1.04	0.95	1.17
Tobacco products	0.90	0.96	0.90
Textiles	4.23	4.95	3.71
Wearing apparel	1.62	1.59	1.49
Leather and related products	0.64	0.54	0.57
Wood and products of wood and cork, except furniture; articles of straw and plaiting materials	0.18	0.16	0.22
Paper and paper products	0.91	1.17	0.98
Printing and reproduction of recorded media	0.74	0.94	0.77
Refined petroleum products and coke	8.47	9.06	5.69
Chemicals and chemical products	7.76	7.43	8.87
Pharmaceuticals, medicinal chemical and botanical products	4.61	4.49	5.61
Rubber and plastics products	2.99	3.46	2.73
Other non-metallic mineral products	5.55	4.37	4.60
Basic metals	10.89	10.47	14.43
(a) Basic iron and steel	9.59	8.63	12.74
(b) Basic precious and other non-ferrous metals	1.30	1.84	1.69
Fabricated metal products, except machinery and equipment	3.08	3.66	2.99
Computer, electronic and optical products	2.56	2.28	1.77
Electrical equipment	3.78	3.82	3.38
Machinery and equipment n.e.c.	5.33	5.17	5.37
Motor vehicles, trailers and semi-trailers	5.19	5.02	5.47
Other transport equipment	2.28	2.50	2.00
Furniture	0.22	0.27	0.15
Other manufacturing	0.98	0.94	1.06
Total	**79.18**	**79.89**	**79.90**

4.4.6.1 The declining weight of petroleum product 2-digit group in 2011-12, which was on account of lower value added in that year, notwithstanding higher physical volumes sold, is a consequence of depressed profitability in the sector, that has been offset by subsidies made available by the Government of India. In the event that Government official policy of automotive fuel prices should be deregulated is given effect to the value added share may rise dramatically. It needs to be ensured that full adjustment for subsides received / receivable is made in the computation of value added in the refined petroleum products sector. The traditional nomenclature in line with international practice has been to call it "Coke, refined petroleum products & nuclear fuel". However, coke as a merchandise product is hardly made and the bulk of both value of output and value added is refined petroleum products and some amount of nuclear fuel. It is recommended that the nomenclature should be amended to take cognizance the underlying reality and the category be termed "Refiner petroleum products, nuclear fuel and coke"

4.4.6.2 On analysing tables 4.3 and 4.4, the following salient points also emerge as noteworthy:

i. Out of the 2-digit NIC groups that represent manufacturing, 8 industry groups constitute a share of approximately 70%, consistently over the years under consideration.

ii. Of the 8 major industry groups, those which exhibit significant change in share (in terms of GVA) within the manufacturing sector are:

- Basic metals
- Chemicals and chemical products
- Refined petroleum products, nuclear fuel & Coke
- Textiles

iii. 'Basic metals' shows a significant increase in 2011-12 as compared to 2004-05 though in between, a decline was observed in 2009-10 and

2010-11. This may be due to the reason that 'fixed capital' and 'productive capital' have increased significantly in 2011-12 as compared to the previous year though the number of factories in both the years showed no significant change.

iv. 'Textiles' shows a significant decline in 2011-12 as compared to the other three previous years. Textile industry predominantly comes under the unorganized sector and therefore, it is under-represented in the ASI. As compared to 2010-11, Gross Value Added (GVA) has declined in 2011-12 though the 'total output' has increased. This may perhaps be explained by the fact that there is significant increase in the 'emoluments to the workers' and 'depreciation of fixed assets'.

v. There is consistent increase in 'Refined Petroleum Products' in 2009-10 and 2010-11 as compared to 2004-05 followed by a sudden decline in 2011-12.'Total input' in this industry group has increased sharply in 2011-12, which has offset the increase in 'total output' to an extent that the Value Added has declined.

vi. 'Chemicals and Chemical Products' shows a steady growth in 2009-10, 2010-11 and 2011-12 over 2004-05, primarily due to the growth in the pharmaceuticals and agro-chemical industry.

4.5 Data flow

4.5.1 Selection of factories

4.5.1.1 As already mentioned earlier the Working Group has recommended that factories be selected from a frame derived by supplementing the frame of ASI with the list of factories available from the different source agencies, and the relevant frame of private manufacturers registered with the Ministry of Corporate Affairs under the Companies Act, 1956.

4.5.1.2 An exercise was undertaken by the IIP Unit of the CSO to establish a manufacturing frame from the database of all the companies registered with Ministry of Corporate Affairs (approximately 10 lakh companies). A sub-database containing 1.96 lakh companies falling under the manufacturing sector as identified through their available NIC-2004 industry codes could be created. Of all these companies a substantial number provided details of their manufacturing units including their addresses, functional status and line of production. This list of manufacturing units may be used to augment the frame for sampling. It may also be examined whether any large unit is being missed from the 6th Economic Census Directory, while finalizing the frame.

4.5.1.3 The selection of factories is linked to final list of items to be covered for the IIP compilation. Thus, the following steps are required to be completed before the list of factories/ establishments can be firmed up:

i. Mapping of establishments/ factories with items in the item basket of IIP.

ii. Short listing of establishments/ factories which were operational during the proposed base year (2011-12) and previous two years (2009-10 and 2010-11)

iii. Procuring annual production data for the three years 2009-10 to 2011-12,in respect of the selected items from the establishments/ factories or other sources.

iv. Identification of major producers of each of the items in the item basket.

v. Consultation with source agencies/ other concerned organizations for finalizing the panel of establishments/ factories keeping in view assured availability of monthly data.

4.5.1.4 The Working Group recommends using factory-level production data for all items in the selected basket for three years from 2009-10 to 2011-12 from the above frame to arrive at a complete list of all factories (i) producing the items in at-least one of the years, (ii) having a substantial combined/ aggregate share (at least 25%) of production in the total output of the product and (iii) selecting a significant number of factories per item, based on availability in the frame.

4.5.1.5 A data quality issue might arise if new units are included all of a sudden in the panel[13] of producing units for reporting production data. CSO has reported that this has happened in the recent past for a couple of source agencies, and if actually resorted to frequently, might go undetected unless the data give rise to serious biases. CSO has also observed that even if detected, the data as already reported are confirmed as correct by the source-agency concerned on back-referencing without any further qualification as to what units the excess data have been reported for. For considering the desirability of including new units in the panel of factories as mid-term corrections during the run of an IIP series, the Technical Review Committee, to be constituted as proposed by the WG, may review such cases and decide on case to case basis, the methodology of including the same in the panel of factories.

4.5.1.6 Just as new units commence production, units get closed as well. The bias that creeps in due to non-replacement of closed or dead units of the panel is another matter that requires some serious thinking. There is enough substance in replacing a closed unit by an operating unit of equivalent product and turnover/volume of production (Equivalent production may be in terms of the annual production of the closed unit in question during the base year). The Working Group

[13] A fixed set of producing units as determined at the time of fixing the base year is considered to be the panel of units for which production data are required to be reported month after month for calculation of monthly IIPs.

recommends that a reserve panel of factories may be maintained for possible substitution to be made in deserving cases in consultation with the CSO. While it was agreed that a reserve list of factories is necessary for substituting units showing consistent non-response, it was further prescribed that non-response for three months in succession may render a unit fit to be replaced.

4.5.2 Integrated system of data collection/ validation: The Working Group has envisaged creation of a web-portal for direct uploading of data from the establishments in cooperation with various administrative agencies of the Government of India which have regulatory or legislative control over the establishments from which data is being sought. The data will be collected by the sources themselves and a sharing mechanism will be developed for automated flow of data to the servers of CSO after passing through validation/estimation at intermediate stages, done by the sources, which may be in-built into the system of data collection. For creation of such systems with methods of data validation and missing data estimation, guidance should be provided by CSO to the sources responsible for the same. The detailed discussions pertaining to this issue is in Chapter V.

4.5.3 Compilation: As mentioned in Chapter III, the Laspeyres' index formula has to be used to compile indices for industrial production with the new base year. The compilation is a step-by-step method as in any index compilation. The compilation starts with the product level or item level indices using quantity relatives. These product level indices are then combined to form the higher level indices, at 4-digit, 3-digit and 2-digit levels of NIC using the Laspeyres' formula and the weights at the respective levels. The 2-digit level indices are then used to form the sectoral indices and the general indices, as is the current practice. Compilation is also done for the Use-Based Classifications (UBCs) using the same methodology of Laspeyres' index with weights of each of the use-based classifications derived using weights of individual items comprising the UBCs.

4.5.4 Dissemination

4.5.4.1 With regard to the presentation and dissemination of indices, UNSD recommends the following:

i. Index numbers rather than monetary values should be used to present industrial production volume measures.

ii. Index numbers should be presented till one decimal place.

iii. Long (at least 5 years) and coherent time series must be provided to users.

iv. Those product groups or industries which are primarily responsible for the monthly movement in the IIP in terms of contribution to the overall change in the IIP should be presented to users.

v. Data to be made available to all users at the same time.

vi. Consistent presentation and reporting practices over time.

vii. Weights by industry to be made available to users.

viii. Data to be accompanied by the methodological explanation and advice

All the aforementioned recommendations are already being followed for the monthly press release on IIP brought out by CSO and the information are made available on the Ministry's website.

4.5.4.2 Apart from the above recommendations, **Working Group endorsed the IRIIP recommendation that changes from month-to-month and from the same month one year earlier should both be presented. Since, currently, month-to-month change is not brought out in the press release one statement in respect of changes in the current month over the preceding month may be added. It was also suggested that quarterly IIP and growth rates should be brought out along with the monthly press release at the end of each quarter.** The confidentiality of individual survey respondents is already being maintained since CSO uses secondary

data for compilation of IIP. Also as per IRIIP recommendations, metadata should be provided. It is also suggested that data be accompanied with commentary that assists users to make their own judgments about the economic implications, and should not make any assessment of current government policies. The contact details of relevant statisticians who can answer various questions by users should be made available with the release of data.

4.5.4.3 For 2-digit categories that have a large weight, such as basic metals and chemicals & chemical products, a few sub-categories should be created and the index and changes in them should be indicated. Thus, to illustrate, the basic metals category can be, for purposes of reporting, separated out as say, ferroalloys, iron & steel, aluminium, other non-ferrous metals. Likewise the chemicals category can be disaggregated, for reporting purpose, as fertilizers, inorganic chemicals, polymers & other organic chemicals.

4.5.4.4 Working Group recommended disaggregation of indices for the purpose of dissemination may be done at the 2-digit NIC level and provided in the public domain in the revised series. The data may be published in EXCEL format on the Ministry of Statistics & PI website.

4.5.4.5 The Working Group also recommended that a mapping of the NIC 2-digit be done with the new use-based classifications proposed and put up on the website of MoSPI for public view.

4.5.5 Mechanism for continuous review

4.5.5.1 The Working Group envisages that the CSO should constitute a Technical Review Committee that will function as an expert body for providing

technical guidance and approvals during the process of finalisation of the revision exercises and will subsequently function as a review committee to monitor on year-to-year basis the progress/ performance of the various processes and related aspects that go into the compilation of IIP and suggest mid-term course correction, if required.

4.5.5.2 The Technical Review Committee will not only include participants/ members from various stakeholder organisations of the Government of India dealing with industrial statistics (IIP in particular), but also academics and experts in Industrial Statistics, to make it more representative and to ensure credible decision making.

4.5.5.3 Broadly, the objectives of the Technical Review Committee as envisaged by the Working Group are as follows:

i. Providing overall guidance and approving the final item basket, weighting diagram, frame of factories and IIP manual for adoption in the revised base year of IIP, viz. 2011-12.

ii. Review annually the list of products in the item basket, after the revised series comes into vogue and suggest methodology for inclusion of new important items in and dropping of unimportant items from the existing basket during currency of the series.

iii. Review annually the panel of factories for compilation of IIP in case any new large unit emerges in the intervening period after the roll out of the new base year. In case a new unit should be included in the existing panel, the Committee will suggest the methodology for taking into account the production of the new unit and adjusting the back series including base production. The Committee may also consider cases of closed units during the currency of the base year and recommend replacing such units by new ones.

iv. Review annually the items in the item basket that exhibit extraordinarily high increase/ decline in index during the currency of a fixed base year and may take a view on re-setting the base production so as to normalize the changes in the indices in keeping with the order of shift in the modified reference line.

CHAPTER V

DATA COLLECTION & QUALITY ASSURANCE

5.1 Evolution of Integrated data collection in the new base year

5.1.1 Mining data in India are collected by Indian Bureau of Mines (IBM) under the Mineral Conservation and Development Rules (MCDR) l955 (revised - 1958 and 1987). The data pertaining to the industry for generation of electricity are mainly collected, compiled and disseminated by the Central Electricity Authority (CEA) under the Ministry of Power.

5.1.2 Apart from the above sources, different central Ministries/ Organisations collect and compile industrial statistics pertaining to their respective domains. Most prominent among them is the Department of Industrial Policy and Promotion (DIPP), in the Ministry of Commerce and Industry, which collect product specific information under the Industries Development and Regulation (IDR) Act 1951, covering various commodity groups on a number of statistical parameters including production from a large number of factories and also provide monthly production data on selected items for the all India IIP. Other administrative ministries also maintain rich databases for factory level production and related statistical indicators and provide data to the CSO for compilation of the IIP. Among such ministries, the conspicuous are, Office of Textile Commissioner, Jute Commissioner and Silk Board for data relating to textile industry; Tea Board, Coffee Board, Office of Salt Commissioner, Directorate of Sugar, Directorate of Vanaspati and Vegetable Oils & Fats for data relating to food industry; Joint Plant Committee (Ministry of Steel) for data relating to steel industry; Ministry of Chemicals and Fertilizers for data on chemicals and fertilizers industry, etc.. The Reserve Bank of India (RBI) also collects and disseminates industrial production data for selected industry groups. For compilation of IIP data is collected

by 16 source agencies as mentioned earlier, using various modes and methods which are detailed in **Annexure V**.

5.1.3 The current system of data collection followed by different sources, employing traditional methods leads to significant non-response and is also vulnerable to errors in data entry, etc. The sources which employ web-based methods of data collection have demonstrated better results in terms of response and accuracy. **Thus, the Working Group advocates institutionalizing a web-based system for data collection directly from the units along with platform-sharing between CSO and administrative agencies for mutual benefit.**

5.1.4 It needs to be appreciated that the roles played by most of the agencies, especially those of the Indian Bureau of Mines for Mining sector and Central Electricity Authority for Electricity sector, apart from the Directorate of Sugar, Tea Board, Coffee Board, Ministry of Petroleum & Natural Gas, Joint Plant Committee and the Office of Salt Commissioner, which collect production data from all manufacturing units are very important and cannot be undermined in supply and authentication of the IIP data for the manufacturing sector. Discounting their domain knowledge and control over units in their respective domain may destabilize the process. However, the Office of Textile Commissioner which collects production data in census mode has a response rate with respect to the number of factories reporting as well as production figures as low as 40-50%. This is to a great extent due to lack of statutory backing which mandates the reporting of production data binding onto the factories. Also paucity of statistically trained personnel for timely collection of data from the units may be another factor. It may also be noted that production figures for five of the thirteen items reported by the Office of Textile Commissioner are indirectly estimated through certain conversion ratios based on raw material availability/ consumption figures received for the rest of the items. In view of the enforcement of the National Jute Board Act, 2008, the Jute Board is mandated to collect and compile more comprehensive statistics on jute and jute products. It is

therefore expected that information in respect of production of jute and jute products, as compared to those compiled by the O/o Jute Commissioner, would be better in quality, coverage and timeliness.

5.1.5 **The Working Group is of the view that a significant step towards improving the data collection system would be the implementation and strict enforcement of the Collection of Statistics Act, 2008**. China and Malaysia already have in place their own versions of the Statistics Acts and compliance with the same has been helpful in improving the data quality significantly. Using appropriate instruments under the Collection of Statistics Act, 2008, may greatly enhance the accountability and responsiveness on the part of the manufacturing units in providing quality data in a timely and systematic manner. The penalty clause under the Collection of Statistics Act, 2008, may be invoked for defaulters, if so warranted. Besides, it may also help in accessing original records maintained by the manufacturing units for data checking and validation.

5.1.6 In order to reduce the time taken in collection and compilation of data as well as minimizing the chances of data entry errors and effectively improving on the response of the manufacturing units, the **Working Group recommends an online web portal system to be in place** to perform the following functions (technical specifications have been detailed in the concept note for setting up a web portal placed at **Annexure VI**):

i. Data input: A user-friendly menu-driven interface for the manufacturing units to upload the data may be the main front-end application along with provision to receive reminders/alerts to unit manager till data is uploaded. Successful uploading of data needs to be confirmed once the validations are completed concurrently with data input.

ii. Validation checks at input-end: Initial validation checks are required to be performed, on the basis of prior information on ancillary parameters, while

entering data. Flash message/ prompts pointing out range overflow may be displayed asking for necessary details for reasons of such overflow. Standard procedures for validation during and after data entry have to work through built-in algorithms.

iii. Authentication/ vetting by controlling ministry/ department: The portal is required to be designed in such a way that the data from the manufacturing units can be accessed by designated agencies, which may be a Ministry or its department and other bodies having administrative control on the affairs of the manufacturing units supplying data for IIP. The controlling agency may then be asked to authenticate the data from their own source and report anomalies, if any, with the details of the error and the corrected production figures within a stipulated time period.

iv. Data flow to central server and compilation: The system being envisaged for improvement in quality and timeliness of IIP data has to necessarily ensure that data from each unit flows to a central server after authentication by controlling agencies with riders and correction file, if any as above, and the authenticated data may then run through a process of compilation to automatically generate indices and growth rates, graphs, charts and reports at several levels.

v. External database query system: A Relational Data Base Management System (RDBMS) at the back end may be set up for storage of time series data and reports of previous releases with a facility to link this database to an open portal for data users with an interface for customized data download.

5.1.7 To facilitate data collection and to implement the web-based system in a full-fledged manner, the **Field Operations Division (FOD) of the National Sample Survey Office (NSSO) may be entrusted with the responsibility of sensitizing the factories for timely reporting of IIP data as well as providing guidance and technical support**, wherever required. The assistance of NSSO (FOD) may be discontinued after a period of time once regular dataflow is achieved.

5.1.8 **The Working Group recommends that the Source Agencies must gear up their data collection system to web-enabled system.** In anticipation of the revision in IIP and the data requirement, along with its own mandate for collecting and maintaining production returns from all industries included in the First Schedule of the Industries Development and Regulation Act 1951, the major Source Agency, DIPP has already provided for a Plan Scheme component under National Manufacturing Policy 2011for strengthening industrial statistics. The Production Monitoring System (PMS) in DIPP is being revamped inter-alia with facilitation of web-based direct data entry by industrial units. The PMS is being developed through NICSI and testing of the system is scheduled during 2015-16. Once the PMS is revamped, it might even be possible for Department of Industrial Policy and Promotion to take up responsibility of more items from among the industries included in the First Schedule to the ID&R Act 1951 (some of these today have different Source Agencies for purpose of IIP) in alignment with the products in the new basket that might be prescribed by the Government as per recommendations of the Working Group.

5.1.9 The proposed PMS should have facility for online uploading of production data by the industrial units and such data should be subjected to advanced validation checks with the use of Data Analytics software. The software should be capable of generating email and SMS messages regarding the inconsistency to the authorized persons who can provide instant clarifications. This process should be a live and interactive process so that inconsistencies are observed and communicated in real time. The system may also provide for automatic generation of online reminders to units when the relevant production data is not received in time. This may help reduce the non-response. Use of data analytics software can also help in better imputation of non-response by following more sophisticated procedure than is possible in a manual environment.

5.1.10 **The Working Group was of the view that efforts for mass awareness about IIP may be made through brochures/ flyers and information on the website of MoSPI**. Also Industry Associations may be associated in facilitating publicity and awareness activities, particularly the periodic seminars and discussions on the IIP.

5.1.11 NSSO (FOD) may follow-up with the units which should be registered under the Factories Act in the list of Chief Inspector of Factories in the States and provide in writing, list(s) of all such units to be enlisted/registered. The Working Group opined that **on the issue of updation of list of factories maintained by the Chief Inspector of Factories, direct line of communication could be opened between MoSPI and higher levels in the State Governments.**

5.2 Estimation of missing data

5.2.1 The Working Group recognised the fact that different methods of estimating production of non-responding units employed by the source agencies in different manufacturing sectors cannot be fully done away with (refer **Annexure VII**). These methods however, should be statistically valid and rational. **The group therefore, recommends that a standard literature of methodological options in different scenarios could be developed at ESD, CSO for the estimation of production of non-responding units**. Appropriate methodology maybe followed by a source agency depending on the nature of a product/product-group and its production pattern.

5.2.2 As characteristics of the items under the purview of different source agencies are different, uniform estimation procedure for non-responding units may not be appropriate for all the items. Administrative ministries / departments supplying production data may develop/ refine their own method for estimation of production from non-responding units in consultation with CSO. In any case an appropriate

method out of those to be prescribed by CSO in its literature for standards may be preferred.

5.2.3 According to the IRIIP recommendations, missing data are to be estimated using imputation techniques or an administrative data replacement strategy so the data matrix is complete. In India, currently imputation of production data for non-response is done at the Source Agency level, i.e. before being supplied to CSO for data collation and compilation of IIP. In the current series, CSO has prescribed the following three methods for estimating the production of non-responding units:

i. Using previous month's production figure of the particular unit

ii. Using previous year same month's production figure of the particular unit

iii. Using average of the last 3 months' production figures of the particular unit.

5.2.4 **Working Group also recommends that DIPP, as the major Source Agency might assist CSO in producing the standard literature of methodological options for estimation of production of non-responding units for the manufactured items cutting across Source Industries.** The results of this exercise would help in developing the necessary software for web-enabled data collection system being envisaged by this Working Group which should serve inter-alia as a major engine for robust estimation procedure.

5.2.5 For improving the efficiency of the estimates, the following norms may also be kept in view:

i. Average month-on-month percentage change for last 5 years

ii. Imputing average of last 3 months' production figures

iii. Previous month's data * (seasonal factor for current month / seasonal factor for previous month)

iv. Month-to-month growth of previous year on previous month's figure

5.2.6 CSO may also be associated by DIPP while giving finalising the new PMS in DIPP for efficient use of the resources taking into consideration the requirement envisaged in this report for the web-enabled system of CSO for the IIP.

5.3 Understanding the existing validation techniques and their effectiveness

5.3.1 The Source Agencies employ a mix of various methods for collection of data on their part. Some of these have considerable reliance on traditional methods such as e-mailing computerized data tables, faxing manually prepared data tables and texts and postal dispatch of data sets. These procedures involve considerable time spent on typing out the data from one document to another (i.e. data transcription), often from/ to different media, and then visual/manual checking of data, element-by-element, by comparing with the source document from which the data have been transferred. This type of semi-automated system does not allow immediate spotting of errors at the source of their origin. Validating data collected under such a system involves checking of original administrative records, correspondence with original data provider in case of doubt and sometimes field visits to set right the data errors. Data validation could be a more time-consuming affair than data preparation. When there is a given time target for completing these processes of data preparation and validation at the source agency level and report the data for the subsequent processes to take place at another organization, ensuring the accuracy of individual entries is a challenge for Source Agencies.

5.3.2 In this context, there is a need to distinguish between two types of validation problems: (a) wrong or dubious numerical entries with no significant effect on the end results and (b) wrong or dubious entries with significant effect on the end-results.

(i) In the case of type (a) errors, most of the times the error goes undetected, as the general checking procedures based on tolerance limits or visual magnitude-sensing fail to discover the incidence. In the existing system they are ignored on the ground that they entail insignificant economic effect. However, sometimes, not only mistakes in data entry, but even possible inaccuracy in the estimates made might go undetected.

(ii) In the case of type (b) errors, existing validation method that is followed at CSO end comprises a new set of filtering criteria introduced in the year 2012 as below, based on which CSO seeks confirmation of item-level production for the filtered items from the source agencies in addition to validation of production figures for items filtered by older criteria/ tolerance intervals[14].

5.3.3 New criteria of validation introduced in 2012 in CSO:

(a) Current month's production data is checked to see whether it falls below the minimum production value in the past 12 months, or above the maximum production for the same period. In the case it lies outside this range, it is calculated (in percentage terms) how much they fall below (above) the minimum (maximum) production value and items showing huge variations are then highlighted and their production figures confirmed by the respective source agencies.

(b) Also, the contribution of each of the 399 item groups towards the overall IIP for the current month is calculated to find out the major contributors to the behavior of the IIP for the said month.

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[14] Older Criteria

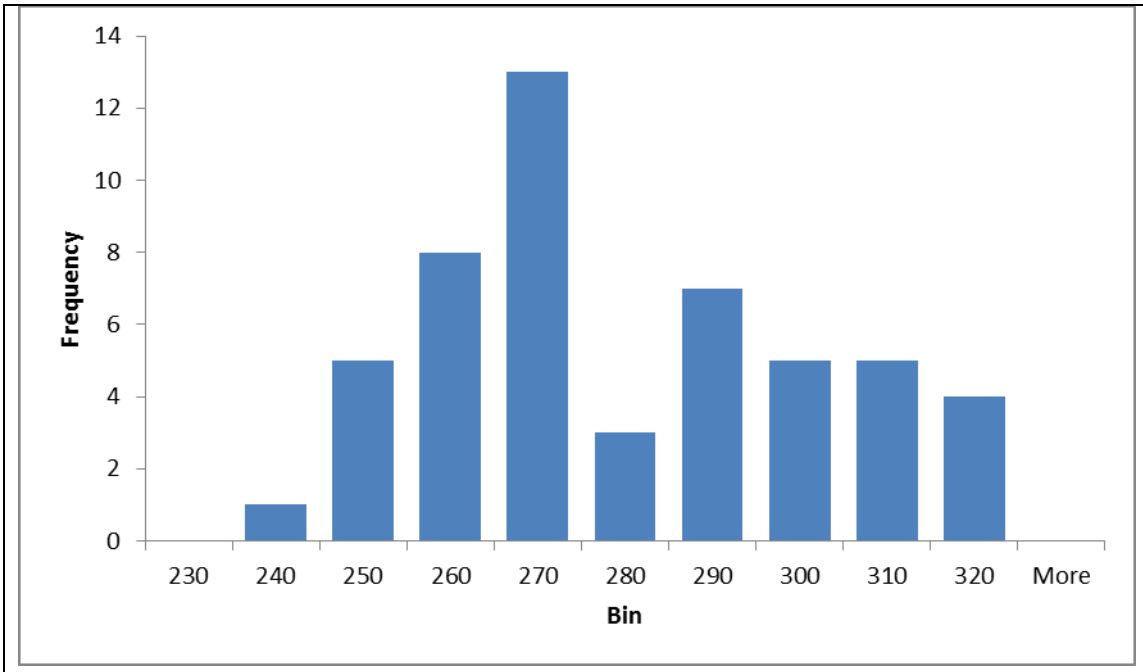
I	More than 20% variation between current month and previous month's production figures
II	More than 30% variation between current month and previous year same month's production figures
III	More than 20% variation between previous month's First Revision and Quick Estimate production figures
IV	More than 10% variation between previous 3rd month's Final Revision & First Revision production figures

(c) CSO has submitted to the Working Group that it is observed that there are a few minor items with small weights which may occasionally return "nil" or "negligible" production figures from the selected manufacturing units under the IIP frame. In such cases of missing values, percentage variation from the previously reported value(s) as and when the missing data incidences occur (and also when data submission might resume) would be very high. In such cases the variation with reference to a long term average production or the production in the corresponding month of the previous year may not be suitable. It is important to check any incidence of 'no-data' cases that appear after 'some-data' reported for those cases over a immediately preceding period of time. Likewise, 'some-data' cases preceded by 'no-data' over a period of time should not also pass unchecked at the entry point. **The Working Group recommends that an appropriate average data may be imputed in the no-data cases to avoid extreme perturbations. However, in cases of prolonged 'nil' data, the production units may be replaced.**

(d) CSO has proposed to the Working Group to consider application of different levels of tolerance (levels of confidence) for data robustness for items with relatively low weight and for items with relatively high weight. A confidence interval about the mean value over a period of time can be written in the form $\mu \pm 3s$, where μ = mean over a period of time and s=the standard deviation of the values over the same period. Generally the probability for a value to lie outside this interval is very small. The confidence interval $\mu \pm 3s$ can be used particularly for small weight items of production to find out if any value for the current month is an outlier and should be checked from the original record.

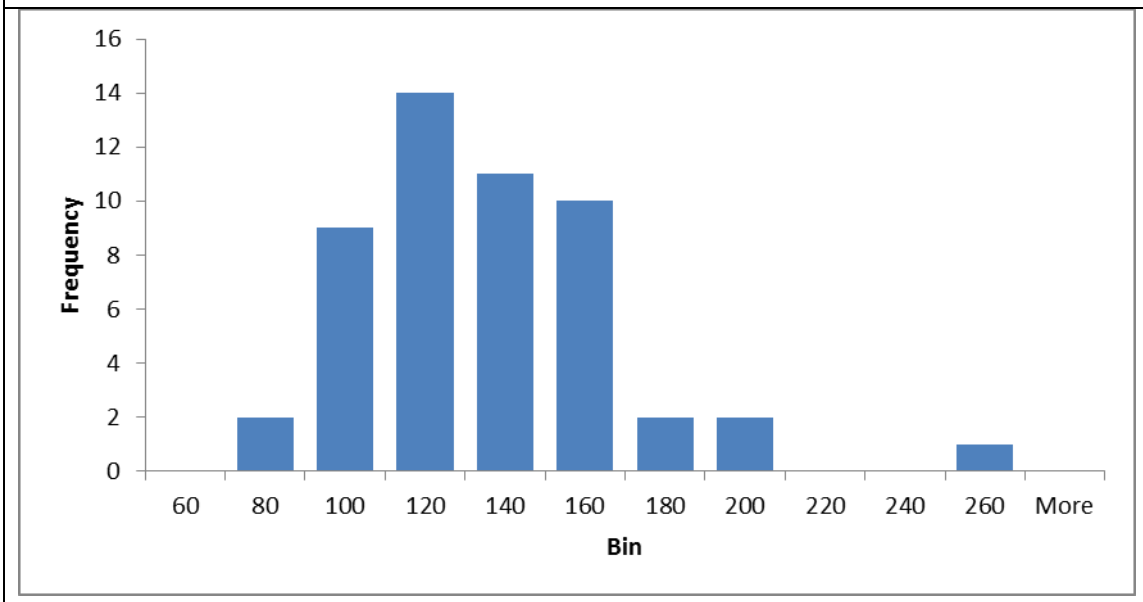
Chart 5.1

Confidence limits for four selected items in the current basket



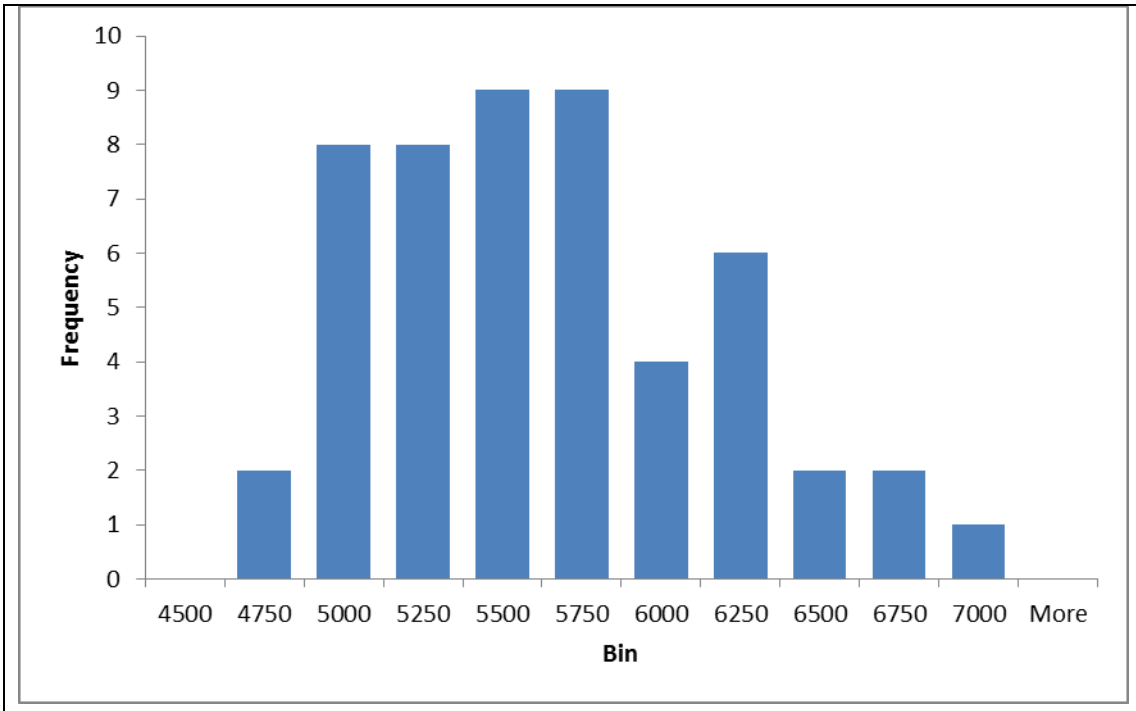
Max	318.7
Min	231.2
Mean	275.6
Median	269.8
Std. Dev.	21.71
LL	232.22
UL	319.07

A: Cotton Yarn; Unit: Million Kg; Weight: 1.5078%



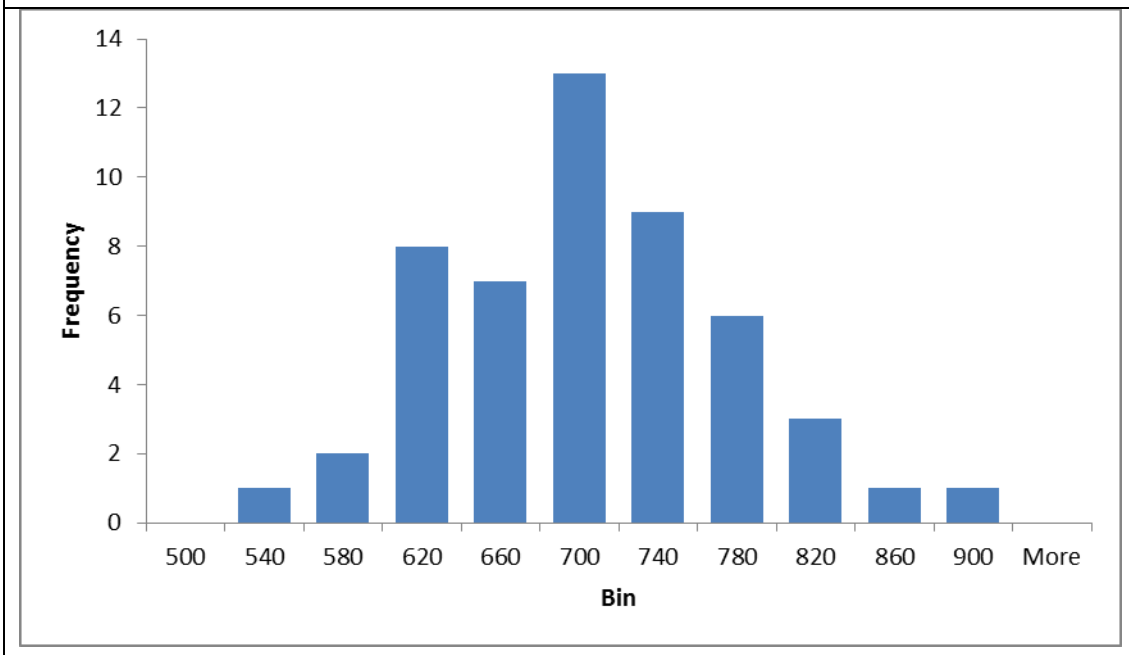
Max	257.6
Min	61.3
Mean	125.0
Median	121.7
Std. Dev.	33.11
LL	58.78
UL	191.22

B: Apparel; Unit: Rs. Crore; Weight: 2.0315%



Max	6802.5
Min	4514.0
Mean	5511.2
Median	5500.0
Std. Dev.	543.91
LL	4423.4
UL	6599.0

C: High Speed Diesel; Unit: TMT; Weight- 2.1135%



Max	872.0
Min	539.0
Mean	686.7
Median	682.1
Std. Dev.	73.49
LL	539.71
UL	833.68

D: Liquefied Natural Gas (LNG); Unit-TMT; Weight- 1.1196%

(e) For high weight items, CSO has suggested that μ ± 2s intervals might be applied. In the existing item basket if we consider the manufactured items of non-seasonal types, those with weights more than 1% exhibit high probability to have their production values lying inside corresponding μ ± 2s limits. For substantiating the proposal, **Chart 5.1** (A to D) may be referred that depict the case for four items in the current item basket. In the charts LL= μ - 2s and UL = μ + 2s stand respectively for lower limit and upper limit of the tolerance range.

(f) As suggested above, for identifying outliers in the time series production of IIP, CSO may take the advantage of Confidence Limits identification but the limiting values must be reset at regular intervals, preferably once in a year to take into account changes in the production pattern during the period, if any. Appropriate computer application may be developed for dynamic updation of the confidence limits as part of the web-based data collection system proposed later in this report.

5.3.4 In this regard, the following key points were noted by the Working Group for implementation subject to procedural/ technical admissibility:

a. Data validation needs to be an integral part of the entire process right from the beginning of data collection and should be carried out in three stages, namely, i) at data entry point, ii) during authentication by source agencies and iii) during data preparation by CSO.

b. For ensuring correctness of data at entry stage, computer aided prompts should be available to the data entry personnel in the web-portal to be developed. These prompts may be based on certain basic resources such as i) item-wise unit level historical data with mean and standard deviation over a period of 3 to 4 years or as reset from time to time; ii) installed capacity of production of the unit; iii) unit level Gross Value of Output (GVO) and ex-factory price, etc.

c. During authentication stage when the data will be verified by the source agencies, scrutiny prompts based on parameters and other auxiliary information as available at the disposal of the source agencies from independent data collection sources may be used for vetting incoming data.

d. For the purpose of trouble-shooting at the processing stage in CSO, the current practice of validation may continue. Additional checks may be introduced for diagnosis of outliers at item level aggregated production figures based on observed mean, median, maximum, minimum of growth rates from its time series.

e. It may also be worthwhile obtaining production information on 'Assessable Value' for excisable commodities on a regular basis from Central Board of Excise and Customs to regularly monitor the growth divergences between that of IIP and excise revenue.

5.4 Comparative Exercises & Studies

5.4.1 Comparison of IIP with Excise Revenue Growth

5.4.1.1 A quality review of the IIP should be undertaken regularly with other relevant data sources. Comparison with excise revenue growth is a point in case. CSO conducted a study to compare the trends of excise revenue with IIP to establish whether there is a concordance in the patterns depicted by the two sources of industrial data. For this purpose, monthly data of Excise Revenue was collected from April 2004 to March 2011, spanning a period of 84 months over 7 financial years. Annual and monthly comparisons were made after finding the year-on-year growth rates using excise revenue data and manufacturing indices for IIP.

i. Annual comparison

Table 5.1 and **Chart 5.2** show the comparison between the annual growth rates of excise revenue and manufacturing sector indices of IIP.

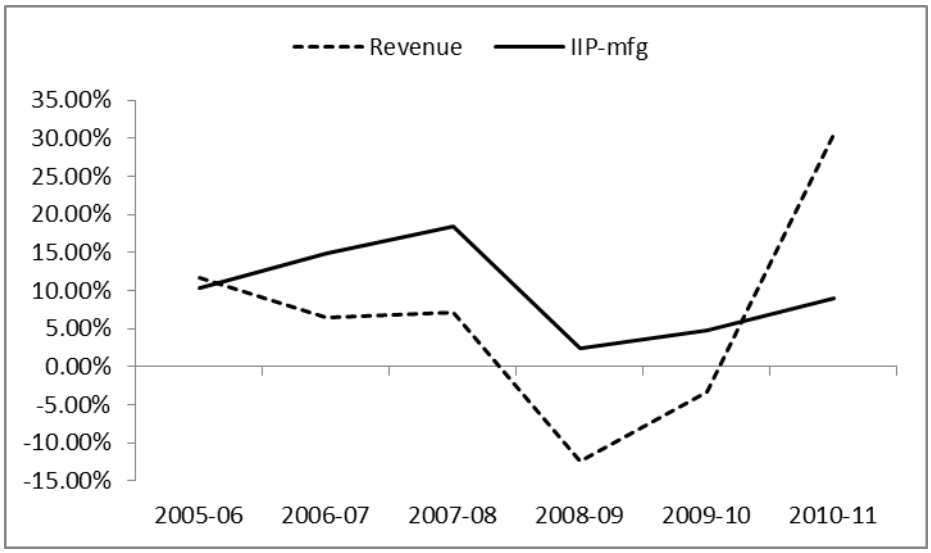
Table 5.1

Comparison of annual growth rates of Excise Revenue data and IIP

Data Source	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Excise revenue	11.73%	6.47%	7.22%	–12.38%	–3.24%	30.56%
IIP (mfg.)	10.29%	14.96%	18.40%	2.47%	4.83%	8.95%

Chart 5.2

Growth rates of Excise revenue and IIP

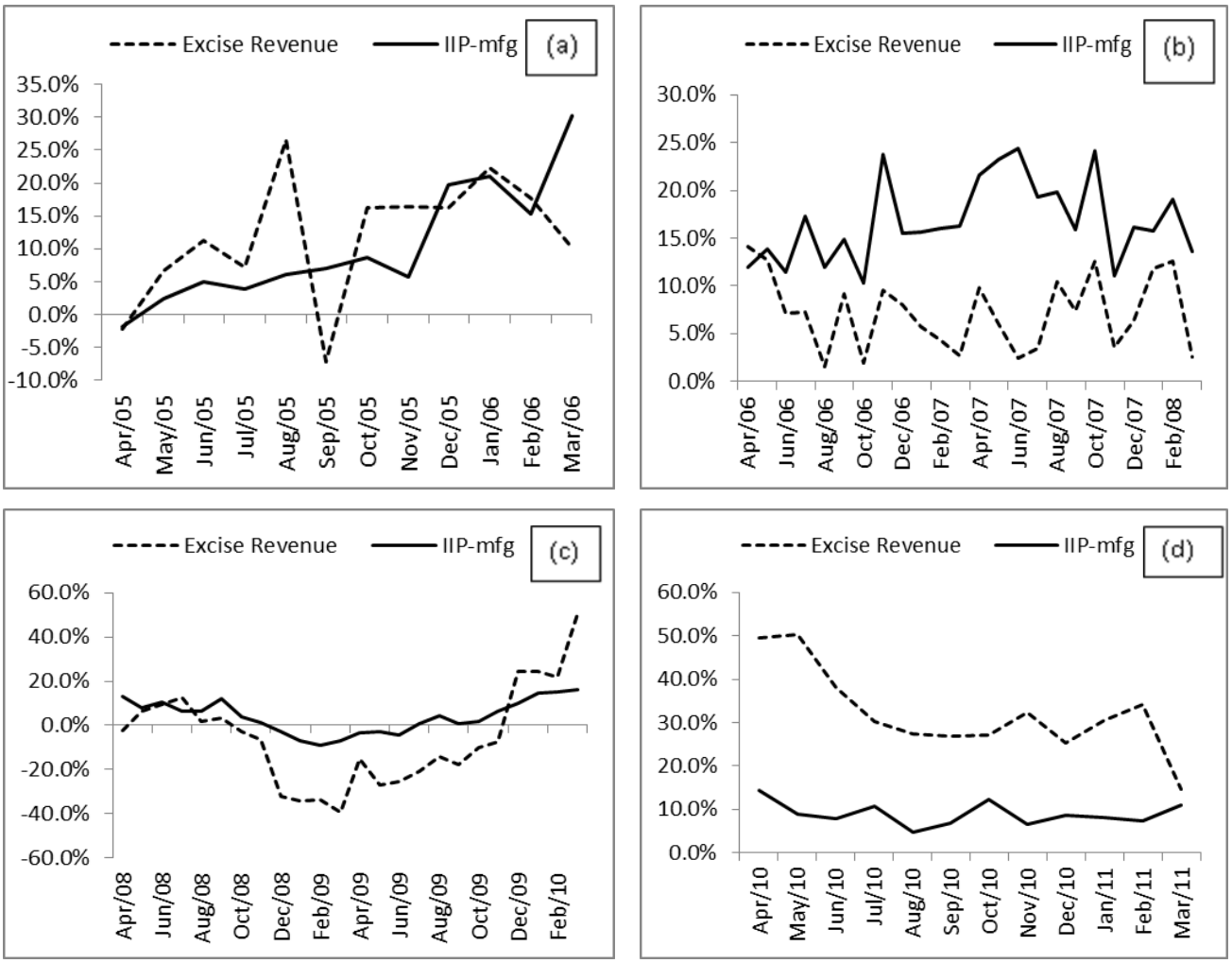


(a) As is evident from both table and graph above, the growth rates from the IIP manufacturing indices are uniformly higher in all the years from 2005-06 except in 2010-11 when excise growth rate is higher than IIP growth rate. This might be explained by the fact that the government went on an overdrive for bettering the indirect tax collection, which might not necessarily be in line

with the output performance of the industrial sector. This might be warranted due to other reasons prevailing in the economy.

Chart 5.3

Growth rates of Excise Revenue and IIP in four periods between 2005-06 and 2010-11



ii. <u>Monthly comparison</u>

(a) Since, while making a monthly comparison of the growth rates from the two data sources, we are making use of 84 months' data, which is a considerably long period of time, the study looks at the series with breaks into four separate, more congruent time periods so as to facilitate studying the

overall trend exhibited by both the sources and making the results simpler to understand and conforming to the overall trend in the economy. **Chart 5.3** shows the monthly growth rates (over the same month in the previous year) of excise revenue data as compared to growth rates of the manufacturing sector as per IIP for 4 successive time periods, namely-(a) April 2005 to March 2006, (b) April 2006 to March 2008, (c) April 2008 to March 2010 and (d) April 2010 to March 2011.

(b) The growth rates from both the data sources have mirrored the economic trend of the "good" year of 2005-06 accurately with both datasets having growth rates very close to each other. It is well-known that the manufacturing sector started picking up from 2005-06 and grew till the onset of recession in 2008-09 which is probably the reason why the IIP growth rates are much higher since it is indicative of the actual performance of the manufacturing sector and the excise revenue growth rates and IIP growth rates are more or less equidistant in these years which implies a stable pattern of both the series in these years. From **Chart 5.3 (c)**, it can be seen that for the periods April 2008 to November 2009, there is glaring evidence of the effect as the growth rates from both the datasets start hovering around zero, the excise growth rates being still lower. Post fiscal stimulus administered to bring the economy back on track, especially for the manufacturing sector, the government directly or indirectly laid emphasis on increasing the collections from excise revenue leading to shooting up of the growth rates from excise revenue above IIP; it may also be observed that, coupled with the effect of the emphasis on excise collection, the incentives provided by the stimulus must have taken time to show up in the performance of the manufacturing sector making the growth rates from the two datasets diverge. It can clearly be seen that excise revenue data is more sensitive to policy implications of the tax regime rather than being based on actual performance.

(c) However, it must be borne in mind that for the above study, the total excise revenue collection was considered for comparison discounting the fact

that excise rates may differ significantly from year to year. It could be possible that much of the difference between the IIP and the Excise Revenue trends may be due to changes in excise rates over time. **Hence the Working Group recommends that in order to make the comparison of trend of IIP with that of Excise revenue on a continuous basis, a mechanism must be developed for arranging data to be sourced from the Department of Revenue on the 'Assessable value' of production of excisable commodities.**

5.4.2 Comparison of IIP with ASI

(a) Since Annual Survey of Industries (ASI) is the main source of long-term industrial statistics, it calls for a comparison of Index of Industrial Production (IIP) figures and its growth rates vis-à-vis similar measures derived from ASI results. By bringing the two data sets (sourced differently) on a common framework (defined by a common set of items and common set of manufacturers) for comparability, the prime objective is to understand the pattern of growth of the industrial sector as depicted by the data from the two sources- differences in the two and the reasons thereof. It is also worthwhile examining patterns in differences between two sources, if any.

(b) Problems in comparison

i. Since IIP is based on item groups and not individual items, as in the case of ASI, direct comparability is not possible.

ii. IIP, being a short-term indicator, is based on data collected from a much smaller sample of factories as compared to that of ASI.

iii. There are inherent fluctuations/ volatility in the production data reported in quantity terms in ASI due to the coverage of sample sector which varies year-on-year.

(c) At ESD, CSO, a comparative study was undertaken by following two approaches to tackle the above problems in order to compare ASI data and IIP data, which are detailed as follows:

5.4.2.1 Approach I: Comparable product-set measures

(a) Item groups with substantial weight (i.e. >0.1%) were chosen from the item basket of IIP for manufacturing sector (comprising 397 item groups) for the purpose of comparison. Description of item group thus chosen was matched with the closest ASICC description available in ASI. A total of 144 items thus matched having an aggregate weight of 60.56% out of 75.53% weight of the manufacturing sector (amounting to 80.2% of the total manufacturing sector weight) was used for the comparison. The exercise was undertaken for a time span of 5 years, i.e. 2005-06 to 2009-10.

(b) It has been observed that an item generally occurs in more than 1 industry groups (NIC 3-digit), since data in ASI is collected from factories in such a way that the industrial classification assigned to a particular factory corresponds to that of the major product manufactured in the particular factory as per its GVOs and all its other manufactured products irrespective of their ASICC codes get aligned to the same NIC 3-digit group. As a result same item may occur in correspondence with different industry groups for different factories. Two separate methods have been adopted to assign values to ASICC items to deal with this intrinsic problem of ASI data as explained below:

i. The aggregated value across all industry groups for a particular item

ii. The value corresponding to the most accurate industry group according to the item description

(c) Since production quantities were not available for certain items from ASI and since the quantity figures may not be accurate, the corresponding GVO figures were used and deflated using WPI figures for the closest item in

WPI item basket from 2005-06 to 2009-10 to get a series comparable with the quantity figures obtained from DIPP.

(d) Using the deflated GVO values as per methods (a) and (b) for years 2005-06 to 2009-10, indices at item level were formed using 2004-05 GVO values as base year figures. The value relatives were multiplied by weights derived from the existing IIP series, with the weighting diagram being the recast by scaling the weights of selected item groups of IIP in the proportion of their sum to a total of 1000.

(e) Similarly, the IIP annual indices were re-calculated over the subset of the selected item groups using their rescaled weights as above. Using these item-level indices, higher level indices at 4-digit, 3-digit and 2-digit of NIC were calculated along with the general index for both ASI and IIP for all the 5 years. The indices were also calculated as per their use-based classifications after following a similar method of weight-rescaling.

5.4.2.2. Results by Approach-I

(a) A total of 144 items having an aggregate weight of 60.56% in the item basket of IIP out of a total weight of 75.53% in the manufacturing sector (amounting to 80.2% of the total manufacturing sector weight) was used for the comparison. These 144 items when further classified by NIC 2 digits, the distribution of weights are depicted in **Annexure VIII**. Here it is important to note that this is the first study of its kind undertaken to understand the differences between the two most significant official sources on Industrial Statistics- ASI & IIP. It has been observed that there is considerable mismatch in quantity figures between the two datasets and therefore, GVO from ASI data was used for the purpose of comparing the growths.

(b) We should also bear in mind that the figures for ASI are based on a much larger sample size compared to those for IIP, thus growth rates of absolute quantities or values are not comparable as well. Hence the indices

were constructed for safe comparison of the two sources and drawing valid inferences. Also due to high volatility in ASI data at the disaggregated levels, comparison of growth rates from indices is not possible at the lower levels of NIC. However quite a meaningful and revealing picture emerges when we deal with the overall comparison at higher levels of aggregation.

(c) The growth rates for all 144 items using ASI data, by methods (a) and (b), and IIP for the years 2005-06 to 2009-10 are presented in **Table 5.3**

Table 5.3

Growth rates of ASI and IIP

Data source	**Growth Rates**					
	2005-06	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**Average**
ASI - using method (a)	19.2%	9.5%	17.4%	-8.0%	13.5%	10.32%
ASI - using method (b)	19.5%	9.9%	18.3%	-0.4%	4.4%	10.34%
IIP -selected items only	10.3%	15.9%	20.0%	3.2%	5.1%	10.90%

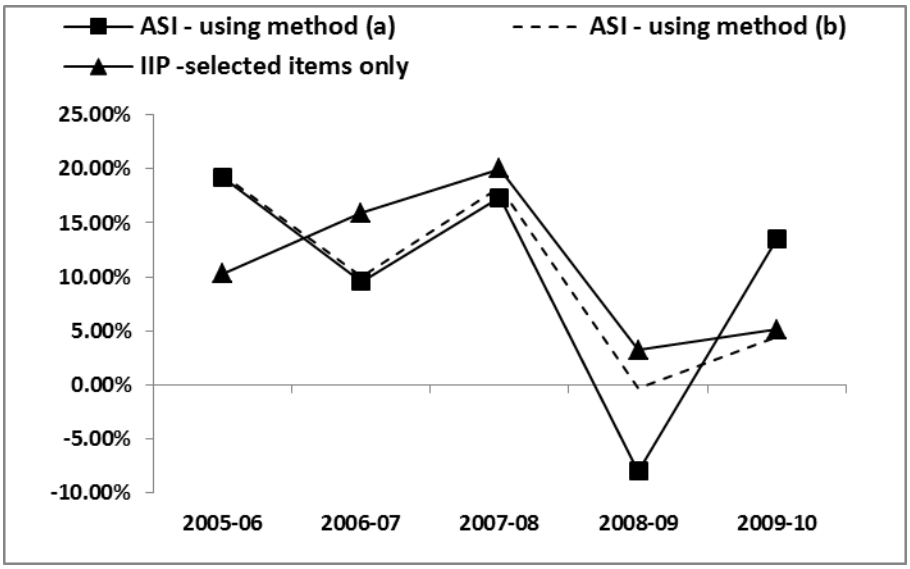
(d) The growth rates from IIP data and ASI data using method (b) (refer Figure 4) are relatively closer (excepting for the year 2005-06) as compared to those from ASI data using method (a). The patterns emerging from growth rates using ASI method (b) and IIP exhibit similar trends from 2006-07 to 2009-10. It may be noticed that growth rates as per the two methods for ASI data start diverging from 2008-09. Also the growth rates of IIP and ASI by method (a) start forking from 2008-09.

(e) The growth rates as per IIP and ASI data sets for the year 2005-06 are divergent whereas they should have been similar for a period so close to the base year since the item basket and weighing diagram of IIP are based on ASI 2004-05. This might be due to the effect of the sample sector in ASI data due to which there is large volatility from year-to-year on item level data. It is noticeable that the growth rates as per IIP data have logical inferences in terms

of the actual economic outlook prevalent in the country in all the years, especially from 2008-09.

Chart 5.4

Overall Growth rates of indices using ASI and IIP data



(f) Thus, it may be inferred that movement of IIP and ASI using accurate industrial classification is likely to be similar. But ASI portrays a more volatile pattern since IIP is mostly based on panel data, which may lend it more stability and show less fluctuation, while ASI's sampling list varies year-on-year.

(g) The 144 items selected for this study were similarly classified according to use-based categories for which the distribution of weights are as depicted in **Table 5.4**:

(h) The study shows that the growth rates as per use-based classification portray a similar trend. For 'Consumer durables' and 'Capital goods' categories, the average growth rates calculated over the entire period for IIP are much higher than the corresponding growth rates depicted by ASI data. However for the rest of the categories, the ASI growth rates are higher.

Table 5.4

Re-distribution of weights as per use-based classification

Use-based categories	No. of items	Original weight in IIP (out of 1000)	Scaled weight for comparison (out of 1000)
Basic goods	36	170.42	281.43
Capital goods	24	67.54	111.54
Intermediate goods	37	115.09	190.05
Consumer durables	14	74.94	123.75
Consumer nondurables	33	177.56	293.23
Total	**144**	**605.58**	**1,000.00**

(i) There is evidence of divergence in growth rates of the categories of 'Consumer Durables' and 'Consumer Non-durables' for 2009-10. In totality, it is observed that IIP growth rates peak in all use-based-categories (UBCs) in 2007-08 and decline in 2008-09, succeeded by a recovery in 2009-10 except in the category of 'Capital' goods since economic recovery in 'Capital' goods is sluggish. This is also supported by the fact that capital formation has not taken off even after fiscal stimulus during recession. From the UBC growth rates calculated from ASI data, no clear pattern emerges, however, the growth rates are seen to be highly volatile.

(j) From the above study, it emerges that though there is no clear comparability between year-on-year growth rates as calculated from ASI and IIP, it is interesting to note that the pattern of growth rates in the longer run are comparable.

5.4.2.3 Approach-II: Comparable establishment-set measures

(a) Since by the Approach-I the study compared data of different volumes in terms of number of units reporting data and compared value to quantity, creation of indices for mapping overall movement in growth was necessary. In the second approach, the study had a closer scrutiny of matching/ comparable

results of the two sources. For this purpose, from the list of factories in the frame of DIPP (a source agency of IIP which supplies data on 268 out of 397 item groups of manufacturing sector), a set common with that of ASI was identified.

(b) For this common set of factories, the production figures for the items reported by these factories to CSO (IS Wing) and DIPP respectively for ASI and IIP have been used. Thus a common set of factories reporting production figures for a common set of items to the two agencies for the years 2008-09 and 2009-10 made it possible to match a panel of ASI item level production data to that of an equivalent panel of IIP production data and infer there from about any variations and reasons explaining such variations.

5.4.2.4 Results by Approach - II

(a) Using the two lists (i.e. the lists of factories and their production data for the years 2008-09 and 2009-10 as per ASI and DIPP) a common list of factories was ascertained by matching four parameters, namely Factory name, PSL No., State code and description of the item produced by factory, on a factory-to-factory basis. At the end of this exercise, a list of 203 common factories could be drawn out of which data was available for both the years for only 142 factories. Again, since the units of quantity for ASI and DIPP production data were not convertible for 36 factories, a final list of 106 factories was actually useful. Production data on 47 items was used for comparison of these common set of factories for two years from DIPP and ASI. Out of these 106 factories, it was found that three factories report data to ASI but not to DIPP. For 22 factories out of the total, the production data matched.

(b) Growth rates were obtained for both data sources for the year 2009-10 as compared to 2008-09. A comparative summary of the distribution of growth rates as per the two sources is as given in **Table 5.5** below.

Table 5.5

Distribution of growth rates for ASI and DIPP data

Interval for GRs	ASI	DIPP
<-30%	20	12
-30% to -20%	8	8
-20% to -10%	10	10
-10% to 0%	18	21
0% to 10%	13	15
10% to 20%	14	15
20% to 30%	6	7
>30%	17	15

(c) It may be observed from the above table, the distribution of growth rates of production data from DIPP factories is more concentrated in the neighbourhood of 0% with lesser number of factories showing extreme growth rates. For ASI data, there are 37 factories with growth rate beyond a reasonable range of ± 30% as against 27 factories from DIPP.

(d) In order to see the difference in the individual factory wise production for each of the years, the ratio of production figures from DIPP and ASI for each year separately has also been studied. The underlying assumption her was that the ratio when averaged over all factories should converge to '1' or in other words, when '1' is subtracted from each of the ratios, the average should converge to '0'. The distribution of this quantity using both the years' data is shown in **Table 5.6**.

(e) It was observed that a set of 61 factories in 2008-09 and 53 factories in 2009-10 out of a total of 106 factories, showed a deviation in the quantity figures of the two sources within the range of ± 20%. Again 44 factories in 2008-09 and 38 factories in 2009-10 report a deviation within the range of ± 5%. This is indicative of the fact that the production figures reported to the two agencies are quite conforming to each other.

Table 5.6

Proximity of production data for ASI and DIPP for two years

Proximity of Production (08-09)	ASI vs. DIPP	Proximity of Production (09-10)	ASI vs. DIPP
within +/- 5%	44	within +/- 5%	38
within +/- 10%	51	within +/- 10%	45
within +/- 15%	56	within +/- 15%	50
within +/- 20%	61	within +/- 20%	53
> 20%	19	> 20%	28
<-20%	26	<-20%	25

(f) Following this, to look at the cross – sectional differences between data reported to ASI and DIPP, the difference of the growth rates from the two sources was calculated for 2009-10 over 2008-09 and **Table 5.7** shows the distribution of the proximity of growth rates from the two sources.

Table 5.7

Distribution of proximity of growth rates from ASI and DIPP

Proximity of Growth Rates	ASI vs. DIPP
within +/- 5%	41
within +/- 10%	50
within +/- 15%	57
within +/- 20%	60
> +/-20%	46

(g) The pattern that emerges from the **Table 5.7** conforms to the pattern in **Table 5.6** where the proximity of production and proximity of growth rates exhibit a similar distribution. It may also be noticed from **Table 5.7** that about 40% of factories report production within a neighbourhood range of 5% of each other to the two sources. A similar percentage of factories report growth rate within the same neighbourhood range in terms of growth rates to the two agencies, as well.

(h) To statistically test the hypotheses that the mean of the ratios of the production figures from DIPP and ASI should converge to one when taken over all the 106 units, i.e. the mean of ($Prod_{DIPP}$/ $Prod_{ASI}$ -1) should converge to zero, the one-sample t-test for data of two years separately at 5% level of significance was used. The detailed results are stated in *Table A.I* of **Annexure IX**.

(i) For both the years the p-value is observed to be more than the two-tailed 5% level-of-significance, thereby suggesting that we do not have sufficient evidence to reject the null hypothesis that the mean of the ratios of production figures from ASI and DIPP converges to one when taken over all the 106 units at 5% level-of-significance for both the years of the study.

(j) Further, it is worthwhile comparing the volatility in the growth rates of production data from 106 factories as supplied to ASI and DIPP separately. For this, an F-test was employed to determine whether there is significant difference in volatility in year-on-year growth rates of production data from the two sources. The results of the F-test are detailed in *Table A.II* of **Annexure IX**.

(k) It was observed that for ASI data at 1% level-of-significance, the F statistic value significantly exceeds the critical value of the F distribution and hence it could be inferred that there is evidence at 1% level-of-significance to suggest that there are wide differences in the volatility in growth rates as reported by DIPP and ASI with the volatility in growth rates of ASI far exceeding those from DIPP. From this study, it may be concluded that though the differences in the production data from ASI and DIPP do not differ much on an average, there is significant difference in the volatility exhibited by production data in two sources, ASI being the one having larger volatility year-on-year as compared to DIPP. The variation in the quantity figures between the two sources, if any, may be attributed to the following reasons:

i. **Problem in conversion of quantity figures in ASI data** leading to anomalies in growth rates' comparison.

ii. **Data reported by some factories to ASI and not to DIPP.**

5.5 De-seasonalization of IIP

5.5.1 Aspects of X-12 ARIMA used internationally for de-seasonalization of IIP, have been brought out in a paper which applies X-12 ARIMA in the Indian context [2]. They have identified the seasonal items out of the item basket for IIP and through the method of indirect de-seasonalization (i.e. de-seasonalization at the item level), recalculated the indices for sectoral and use-based groups. They have also calculated the growth rates, year-on-year and month-on-month and compared the de-seasonalized and original series. Though significant differences were found in case of month-on-month growth rate comparisons between the de-seasonalised and the original series, there were no significant differences between the original series and the de-seasonalized series for year-on-year growth rates.

5.5.2 The Working Group members stated that de-seasonalizing indices using X-12 ARIMA involves revision of entire back series data which is not advisable. Besides, releasing two sets of data may induce confusion among the general users of the IIP. Besides, Sub-Group I under the Working Group, also stated that there is, at the moment, no pressing need for releasing de-seasonalized indices officially as the year-on-year growth rates mentioned in the Press Release currently take care of the seasonality factor prevalent in the series. Hence, **the Working Group recommended that the de-seasonalization of the indices will be best left to the users themselves and that CSO will not compile and publish the same.**

5.5.3 In this context, it is worth noting that a Committee has been constituted by CSO under the Chairmanship of Dr. Nachane to develop suitable methodology for de-seasonalisation of all macro indicators including IIP, WPI and GDP, etc. **It is**

therefore recommended that decision of this committee may be considered in due course.

5.6 Chain base index

5.6.1 Historically the production indices for the industrial sector were compiled using a fixed weight approach with weights updated at five-yearly intervals. However, new methods and approaches over the last several decades have been developed to address deficiencies of these types of indices. Therefore the chain-linked approach with annually updated weights has become more preferred in recent years and is the recommended method presented in IRIIP.

5.6.2 An exercise was done at CSO by changing the weights at NIC 2-digit levels annually and compiling chain indices up to 2007-08. An effort was taken to compile chain indices by adjusting weights at 2-digit level of NIC for a few more years beyond 2007-08, but it could not be done as a chained series of the earlier exercise up to 2007-08 due to absence of proper concordance between NIC-04 and NIC-08, the latter being in use since 2008-09 industrial data of ASI. The Working Group appreciates that this type of problems would be encountered every time when there will be a revision to the NIC codes. It was, therefore, concluded that timeliness of revision of base at every 5 years should be strictly maintained rather than going for a chain base index since it was observed that the gap between indices calculated using fixed-base and chain-base methods starts widening after 4-5 years. **Thus, the Working Group is of the view that switching over to a new base year after every 5 years, which is also as per the UNSD International Recommendations for IIP, 2010, would suitably take care of this divergence.**

CHAPTER VI

SUMMARY OF RECOMMENDATIONS

The recommendations of the sub-groups have been considered by the Working Group and their recommendations have been appropriately assimilated in this report.

1. Selection of base year

The Working Group on IIP initially recommended 2009-10 as the new proposed base year for IIP, which was the basis for the exercises undertaken at CSO for the selection of item basket and the drawing of the weighting diagram. However, since the new base year for National Accounts Statistics has already been finalized as 2011-12, which is also proposed to be adopted as the new base year for WPI as well, it was thus, felt that the base year of IIP should be in line with base year of other important macroeconomic aggregates.

Hence, the Working Group recommended 2011-12 as the new base year for IIP.

2. Statistical units, classification and business register

As is the current practice, the elementary statistical unit for collection of data may continue to be establishments only, i.e. factories, mills, etc. and not enterprises. This is in keeping with IRIIP.

Industrial and product classifications:

- NIC-2008, based on ISIC Rev. 4, may be used as the Industrial Classification for the new series.

- The National Product Classification for Manufacturing Sector (NPCMS), based on CPC ver. 2 which has come into force with effect from ASI 2010-11 may be used a product classification for the new series.

While the Working Group suggested continuing with the current sectoral classification of Mining, Manufacturing and Electricity, the use-based classification is recommended to be re-cast as the following for the purpose of dissemination of indices:

- Primary Goods (Mining and Electricity);
- Intermediate Goods;
- Capital Goods; and
- Consumer Goods (Durables and Non-durables).

Although, properly maintained business register (BR) should be used as the frame for sample selection for IIP as per UNSD guidelines, ASI frame would be starting point for deriving frame for selection of factories since BR is yet to be created in India. However, an expanded frame augmenting that of ASI with lists maintained by other source agencies and the relevant frame from Ministry of Corporate Affairs of Private manufacturers and large units from 6th Economic Census, if not included already, may be used as frame for the proposed base year.

Administrative sources, to the maximum possible extent, are being utilized currently as a data source to reduce response burden, as per the UNSD guidelines. Utilizing the same for developing and maintaining a sampling frame is also envisaged for the new series.

3. Scope & frequency

Although UNSD guidelines state that IIP is to be compiled for activities in ISIC Rev. 4 Sections B, C, D and E, i.e. (i) Mining and quarrying, (ii) Manufacturing, (iii) Electricity, Gas, Steam and Air-conditioning supply and (iv) Water supply, Sewerage, Waste management and Remediation activities, due to constraints of the data availability and other resources, it is recommended that status quo in terms of defining the scope of all India IIP be maintained to that of (i) Mining, (ii) Manufacturing and (iii) Electricity.

With regard to the frequency of compilation of the IIP, as recommended in IRIIP, the existing system of bringing out IIP on monthly basis may continue so that turning points in economic development can be identified at the earliest possible point in time.

4. Sources & methods

In India, since Producer's Price Index (PPI) has not been brought out so far, Wholesale Price Index (WPI) would continue being used as deflator for IIP. It is suggested to use 'preferred' methods mentioned in IRIIP 2010 for as many items as possible in the new item basket for 2011-12. It will also be ensured that the WPI item basket includes all the items of the IIP basket for the items whose data will be collected in value terms.

The current practice of using the deflator at the item group level (i.e. the most disaggregated level) maybe continued.

5. Index compilation and related issues

As per the IRIIP recommendations, Laspeyre's index formula is being used for the compilation of IIP. UNSD recommends incorporating quality changes 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. As IIP is computed in India as a quantity index, quality changes are not incorporated. To take into account this recommendation, it is suggested that 'preferred' methods mentioned in IRIIP 2010 may be followed for as many items as possible.

Value of output is recommended as the weight variable to compile the IIP at the product group level of the index, the weights being updated every five years. Currently, GVO is being used as weight variable at 5-digit level of NIC. It is envisaged to undertake the revision exercise every five years thus taking care of the issue of updating product level weights.

Based on findings of an exercise done at CSO, it was suggested that due to changes in Industrial Classification and Product Classification at regular intervals, concordance even at higher levels of NIC is not possible. It is thus recommended that timeliness of revision of base at every 5 years should be strictly maintained rather than going for a chain base index since it was observed that the gap between indices calculated using fixed-base and chain-base methods start widening after 4-5 years.

The Working Group recommended that the de-seasonalization of indices will be best left to the users themselves and that CSO will not compile and publish the same. The Committee set up under Dr. Nachane to look into the issue of de-seasonalization of various macro-indicators may throw light on de-seasonalization of IIP in due course of time.

6. Estimation for missing data

Estimation of production for non-responding units by the Source Agencies would be done strictly in accordance with guidelines of CSO.

The Working Group recommends that a standard literature of methodological options in different scenarios could be developed by CSO in consultation for the estimation of production of non-responding units.

For the above purpose the following norms may also be kept in view:

- Average month-on-month percentage change for last 5 years
- Imputing average of last 3 months' production figures
- Previous month's data * (seasonal factor for current month / seasonal factor for previous month)
- Month-to-month growth of previous year on previous month's figure

7. Presentation & dissemination

With regard to the presentation and dissemination of indices, UNSD recommends the following:

1. Index numbers rather than monetary values should be used to present industrial production volume measures.
2. Index numbers should be presented till one decimal place.
3. Long (at least 5 years) and coherent time series must be provided to users.
4. Those product groups or industries that are primarily responsible for the monthly movement in the IIP are to be presented to users.
5. Data to be made available to all users at the same time.
6. Consistent presentation and reporting practices over time.
7. Weights by industry to be made available to users.
8. Data to be accompanied by the methodological explanation and advice

All the aforementioned recommendations are already being followed for the monthly press release on IIP brought out by CSO and the information are made available on the Ministry's website.

The Working Group recommended disaggregation of indices for the purpose of dissemination may be done at the 2-digit NIC level and provided in the

public domain in the revised series. The data may be published in EXCEL format on the Ministry of Statistics & PI website.

The Working Group also recommended that a mapping of the NIC 2-digit be done with the new use-based classifications proposed and put up on the website of MoSPI for public view. For 2-digit categories that have a large weight, such as basic metals and chemicals & chemical products, a few sub-categories should be created and the index and changes in them should be indicated. Thus, to illustrate the basic metals category can be for purposes of reporting separated out as say ferro-alloys, iron & steel, aluminium, other non-ferrous metals. Likewise the chemicals category can be disaggregated for reporting purpose as fertilizers, inorganic chemicals, polymers & other organic chemicals.

8. Measuring the output

The Working Group recommends output approach (as opposed to value-added approach) by including physical output quantities and values of output which have been in vogue thus far.

In the output approach followed in India, volume estimate is obtained from output in monetary terms at current price value via a process of price deflation. The current price value is deflated by the use of a price index (Wholesale Price Index in case of India) in order to obtain the volume measure. In the item basket framed for the new base year, items that are required to be reported in monetary units and therefore, to be deflated by the WPI of the corresponding items should preferably be exactly identical in the WPI basket. Thus the existing hybrid method of using a mix of physical output quantities and value of output (deflated using WPI) is recommended by the Working Group in the new series.

For items such as heavy machinery, capital goods, etc., it is recommended that value of ‘Operating Work in Progress’ should be collected in order to avoid spikes in

reporting of these items and reduce volatility. Operating Work in progress/ value of production of capital goods will be denoted by the expression "Value of Net Sales of Finished Goods" + ["Closing stock of work-in-progress (i.e. goods under manufacture)" – "Opening stock of work-in-progress"] + ["Closing inventory of unsold Finished Goods" – "Opening Stock of unsold Finished Goods"].

9. Item basket for the new base year

On the basis of the previously proposed base year 2009-10 for IIP, the following item basket was recommended:

Mining Sector

The item basket for minerals and their respective weights provided by IBM consisting of 55 products (4 fuel minerals, 9 metallic minerals, 42 non-metallic minerals) will be adopted as the Mineral Basket. Due to non-availability of data for minor minerals, the IBM did not include the same in the new item basket.

Manufacturing

The item basket consisting of 809 products, re-grouped into 521item groups derived using methodology detailed in Chapter IV is recommended for adoption in new series with 2009-10 as base. The item basket is at Annexure II. The Working Group envisages that only incremental changes will be necessary to this item basket for arriving at the item basket for 2011-12.

Electricity

The Working Group recommends treatment of electricity as a single product for the item basket of the IIP new series as was the practice in the earlier series, too. A product-level-index for electricity is therefore, same as the sectoral index without decomposition into itemized indices.

Since it was later decided by the Working Group to consider 2011-12 as the base year of IIP instead of 2009-10, the Working Group was of the view that the set of items and their weights (selected on the basis of ASI 2009-10 data) may be adequately adjusted using 2011-12 ASI data, as soon as the same becomes available.

The WG also recommended that while selecting items in 2011-12, feedback of source agencies may be obtained and in case the source agencies feel that a significant item has been missed, the same may be included in the item basket. The weights of such items may be derived using item level production data obtained from the sources. For including emerging and new products during the course of a base year, the Working Group recommended that CSO may constitute a Technical Review Committee to review such products, on a periodic basis, and also decide on the methodology for including them in the existing basket.

10. Weighting Diagram for the new base year

The following methodology is recommended to adopt weighting diagram for new series:

- Sectoral weight: Weight for Mining, Manufacturing and Electricity sectors arrived at on the basis of their percentage share in GDP at factor cost in 2009-10

- Weights at 2-digit level: The weight of manufacturing sector distributed in proportion to the total GVA of NIC 2-digit industrial codes from ASI (2009-10) for registered manufacturing sector

- Weights at 3/4 digit level: 2 digit weights distributed to 3/ 4 digit levels in steps in proportion to their respective GVA figures at All India as per ASI 2009-10

- Weights at product/item group level: Finally 4 digit level weights distributed to selected products/item groups in proportion to their GVO as per ASI 2009-10. In a slight departure from the methodology followed currently for the IIP series with base 2004-05, the weights at the product level is recommended to be drawn using average of GVO figures from 2008-09 and 2009-10 to find the weight at the product level.

The weights drawn from 2009-10 ASI data will be adjusted on the basis of 2011-12 data as per methodology prescribed above.

11. Preparation of frame and selection of factories

The Working Group recommends that the frame/ panel of manufacturing units for the manufacturing sector may be developed on the basis of the ASI frame augmented with supplementary list of factories as maintained by the source agencies and the relevant frame from Ministry of Corporate Affairs (MoCA). It may also be examined whether any large unit is being missed from the 6th Economic Census Directory, while finalizing the frame.

The selection of factories is linked to final list of items to be covered for the IIP compilation. Thus, the following steps are required to be completed before the list of factories/ establishments can be firmed up:

- Mapping of establishments/ factories with items in the item basket of IIP.

- Short listing of establishments/ factories which were operational during the proposed base year (2011-12) and previous two years (2009-10 and 2010-11)

- Procuring annual production data for the three years 2009-10 to 2011-12, in respect of the selected items from the establishments/ factories or other sources.

- Identification of major producers of each of the items in the item basket.

- Consultation with source agencies/ other concerned organizations for finalizing the panel of establishments/ factories keeping in view assured availability of monthly data.

The Working Group recommends using factory-level production data for all items in the selected basket for three years from 2009-10 to 2011-12 from the above frame to arrive at a complete list of all factories (i) producing the items in at-least one of the years, (ii) having a substantial cumulative share (at least 25%) of production in the total output and (iii) selecting a significant number of factories per item, based on availability in the frame.

For considering new units for inclusion in the panel of producing units for reporting production data in the midst of a base year, the Technical Review Committee constituted by CSO (see recommendation 9) may review such cases and also decide, on case to case basis, the methodology of including the same in the panel of factories.

The Working Group also recommended that a reserve panel of factories may be maintained for substitution in cases of closure or consistent non-response in the following manner: (i) non-response by a unit for three consecutive months will be treated as closure; (ii) substitution will be done in consultation with the CSO; and (iii) a unit may be replaced by one with equivalent production which may be defined as the annual production of the closed unit in question during the base year.

12. Data collection and related aspects

The Working Group has recommended introducing an online web portal system to be in place to perform the following functions:

i. Data input: A user-friendly menu-driven interface for the manufacturing units to upload the data along with provision to receive reminders/alerts to unit manager till data is uploaded. Successful uploading of data needs to be confirmed once the validations are completed concurrently with data input.

ii. Validation checks at input-end: Initial validation checks are required to be performed, on the basis of prior information on ancillary parameters, while entering data. Flash message/ prompts pointing out range overflow may be displayed asking for necessary details for reasons of such overflow. Standard procedures have to be built in as an algorithm for validation during and after data entry.

iii. Authentication/ vetting by controlling ministry/dept: The portal is required to be designed in such a way that the data from the manufacturing units can be accessed by designated agencies, which may be a Ministry or its department and other bodies having administrative control on the affairs of the manufacturing units supplying data for IIP. The controlling agency may then be asked to authenticate the data from their own source and report anomalies, if any, with the details of the error and the corrected production figures within a stipulated time period.

iv. Data flow to central server and compilation: The system being envisaged for improvement in quality and timeliness of IIP data has to necessarily ensure that data from each unit flows to a central server after authentication by controlling agencies with riders and correction file, if any as above, and the authenticated data may then run through a process of compilation to automatically generate indices and growth rates, graphs, charts and reports at several levels.

v. External database query system: A Relational Data Base Management System (RDBMS) at the back end may be set up for storage of time series data and reports of previous releases with a facility to link this

database to an open portal for data users with an interface for customized data download.

Working Group recommends invoking Collection of Statistics Act, 2008 and rules, 2011 for the purpose of collection of IIP data from establishments.

The Working Group also opined that efforts for mass awareness about IIP may be made through brochures/ flyers and information on the website of MoSPI and through Industry Associations.

13. Data Validation

Working Group has the following recommendations in respect of data validation:

i. Data validation needs to be an integral part of the entire process right from the beginning of data collection and should be carried out in three stages, namely, i) at data entry point , ii) during authentication by source agencies and iii) during data preparation by CSO.

ii. For ensuring correctness of data at entry stage, computer aided prompts should be available to the data entry personnel in the web-portal to be developed. These prompts may be based on certain basic resources such as i) item-wise unit level historical data with mean and standard deviation over a period of 3 to 4 years; ii) installed capacity of production of the unit; iii) unit level Gross Value of Output (GVO) and ex-factory price, etc.

iii. During authentication stage when the data will be verified by the source agencies, scrutiny prompts based on parameters and other auxiliary information as available at the disposal of the source agencies from independent data collection sources may be used for vetting the incoming data.

iv. For the purpose of trouble-shooting at the processing stage in CSO, the current practice of validation may continue. Additional checks may be introduced for diagnosis of outliers at item level aggregated production figures based on observed mean, median, maximum, minimum of growth rates from its time series.

v. It may also be worthwhile obtaining production information for excisable commodities on a regular basis from Central Board of Excise and Customs to regularly monitor the growth divergences between that of IIP and excise revenue.

14. Findings of studies using production data from other sources

On the basis of exercises conducted by CSO, Working Group concludes as follows:

i. As we move from the base year of the current series, due to phasing out of items in the Item Basket, growth rates from IIP are lower (due to inclusion of new items in ASI) especially in the NIC 2 digits: 17, 24 and 31. While selecting the item basket in the new base year, special emphasis may be given to selecting items that are growing in importance in the revised base year, compared to the previous years.

ii. A larger factory size for collection of IIP data may be envisaged and a list of factories exclusive of the ASI frame available with the current source agencies of IIP may be utilized for drawing the frame for a new base year. This list may also be provided to CSO (IS Wing) for the purpose of ASI.

iii. It was noticed during the studies that ASI suffers from common validation/ compilation errors such as conversion of the quantity units, industry group mapping of products and product classification may be

thoroughly looked into to help smooth out extreme volatility exhibited by ASI data at disaggregated levels.

iv. In addition to collecting production quantities from the units, for the purpose of IIP compilation, value of output data may also be collected. On an experimental basis, the experience may be monitored for some time by compiling IIP using values suitably deflated so as to take into account the quality aspect of the items being manufactured alongside the compilation of IIP using production data. This method may be adopted for as many items as possible based on availability of WPI.

v. Monthly data from IIP may be compared with revenue/ production data from Central Board of Excise & Customs (CBEC) and annual comparisons may be made using ASI data so as to check the reliability of the production data and methodology being used for its compilation. Working Group recommends that in order to make the comparison of trend of IIP with that of Excise revenue on a continuous basis, a mechanism must be developed for arranging data to be sourced from the Department of Revenue on the 'Assessable value' of production of excisable commodities.

vi. Benchmarking exercises for marking higher frequency series (IIP) to a lower frequency series conducted using larger sample (e.g. ASI) may be conducted by CSO.

15. Resource gap in statistical capacity

In view of the prevalent problems in collection, compilation and validation of IIP and related statistics and the consequential issues of public trust about the reliability of IIP, the Working Group strongly recommends immediate strengthening of the IIP unit of CSO as well as that of the concerned statistical units in the administrative agencies providing IIP data for improving the functioning of the system and its credibility. It is also recommended that the

augmentation of manpower resources and infrastructural facilities is commensurate with the capacity enhancement in adopting advanced technologies for data collection, validation and processing.

16. Mechanism for continuous review

The Working Group recommends constituting a Technical Review Committee, comprising members from Government as well as non-government experts in the field of industrial statistics, which shall provide technical guidance and approvals for finalization of the base revision exercises and also act as a review committee to monitor the progress/ performance of the various aspects of compilation of IIP on a continuous basis.

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1. Lowe, Joseph, 1823. The Present State of England in Regard to Agriculture, Trade and Finance, 2nd ed., London: Longman, Hurst, Rees, Orme and Brown.

2. S. Mazumder & S. Chakraborty, 2013, Study on Seasonal Adjustment of IIP using X-12 ARIMA, Journal of Industrial Statistics, Vol. II (1), pp 37-67.

3. International Recommendations for the Index of Industrial Production (IRIIP), 2010, Department of Economic and Social Affairs, United Nations Statistics Division. Available at:

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ANNEXURES

ANNEXURE I

No. M -12018/6/2011-ESD
Ministry of Statistics and Programme Implementation
National Statistical Organisation
Central Statistics Office
(Economic Statistics Division)

9th Floor, Jeewan Prakash Building
25, K. G. Marg, New Delhi- 110001
Dated: 4th May, 2012

OFFICE MEMORANDUM

Sub: Working Group for Development of Methodology for compilation of All India Index of Industrial Production (IIP) - reg.

With the approval of the Competent Authority Working Group for Development of Methodology for compilation of All India Index of Industrial Production (IIP) is here constituted with the following Composition and Terms of Reference:

I. Composition of the Working Group

1.	Dr. Saumitra Chaudhuri, Member, Planning Commission, New Delhi	Chairman
2.	Director General, CSO, MOSPI, New Delhi	Member
3.	Director General, NSSO, MOSPI, New Delhi	Member
4.	Dr. Biswanath Goldar, Professor, Institute of Economic Growth, New Delhi	Member (Non-official)
5.	Dr. S.L. Shetty, Economic & Political Weekly Research Foundation, Mumbai	Member (Non-official)
6.	Prof. R. Nagaraj, IGIDR, Mumbai	Member (Non-official)
7.	Prof. Aditya Bhattacharjee, Delhi School of Economics, New Delhi	Member (Non-official)
8.	Dr. M. R. Murthy, Professor (Officiating Director), Institute for the Studies on Industrial Development(ISID), Vasant Kunj, New Delhi	Member (Non-official)
9.	Prof. Pulapre Balakrishnan, Centre for Development Studies, Trivandrum	Member (Non-official)
10.	Dr. N. S. Sidharthan, Madras School of Economics, Chennai	Member (Non-official)
11.	Dr. Kanhaiah Singh, National Council of Applied Economic Research (NCAER), New Delhi	Member (Non-official)

1

12.	Additional Director General (FOD), NSSO	Member
13.	Additional Director General (ESD), CSO	Member
14.	Additional Director General (NAD), CSO	Member
15.	Shri G. C. Manna, Dy. Director General (ESD)	Member
16.	Shri B. K. Giri, Dy. Director General, CSO(ISW)	Member
17.	Mrs. Vishu Maini, DDG, DIPP, M/o Commerce & Industry, New Delhi	Member
18.	Shri G. Sajeevan, DDG, M/o MSME	Member
19.	Representative from RBI	Member
20.	Representative from DEA, M/o Finance	Member
21.	Shri G. K. Basak, Executive Secretary, JPC, Kolkata	Member
22.	Superintending Mineral Economist, IBM, Nagpur	Member
23.	Textile Commissioner, Mumbai	Member
24.	Sh. Kalyan Nag, Director, Dte. of Sugar, New Delhi	Member
25.	Chief Director & Edible Oils Commissioner, Dte of Vanaspati, Vegetable Oils & Fats, New Delhi	Member
26.	Chairman, Tea Board, Kolkata	Member
27.	Chairman, Coffee Board, Bangalore	Member
28.	DDG, O/o Coal Controller, Kolkata	Member
29.	Commissioner, O/o Jute Commissioner, Kolkata	Member
30.	Representative from M/o Petroleum & Natural Gas	Member
31.	Representative from Railway Board	Member
32.	DDG, D/o Chemicals & Petro-Chemicals	Member
33.	DDG, D/o Fertilizers	Member
34.	Representative from Central Electricity Authority	Member
35.	Salt Commissioner, O/o Salt Commissioner, Jaipur	Member
36.	Managing Director, ICRA Ltd., Delhi	Member (Non-official)
37.	Secretary General, FICCI, Delhi	Member
38.	Secretary General, ASSOCHAM, Delhi	Member
39.	Director General, Confederation of Indian Industries (CII), Delhi	Member
40.	Ms. Sonal Verma, Economist, Nomura Securities Ltd., Mumbai	Member (Non-official)
41.	Dr. Ramesh Kolli, Retd. ADG, CSO, Delhi	Member (Non-official)
42.	Ms. Rohini Malkani, Chief Economist, Citi South Asia, Mumbai	Member (Non-official)
43.	Shri A. K. Sadhu, DDG, CSO(ESD)	Member Secretary

II. Terms of Reference of the Working Group:

(a) To review the existing methodology for compilation of All India Index of Industrial Production (IIP) and suggest improvements in the context of international practices.
(b) To consider the Report of the Standing Committee on Industrial Statistics regarding selection of base year (2009-10) of the index and also to examine possibility of using chain base index.
(c) To finalize weighing diagram for IIP and selection of item basket for the purpose.
(d) To identify agencies for collection of production data for the purpose of compilation of IIP and also to examine feasibility of integration of data collection for IIP and WPI for common set of factories.
(e) To suggest procedures for substitution of factories in case of closure or change in production line and also to suggest measures to suitably take into account new large sized factories, which come in production during a particular base period.
(f) Any other area which Working Group may consider necessary and relevant for the purpose of compilation of IIP

III. The Working Group may co-opt any officer(s) or expert(s) as may be deemed necessary by it to help in meeting its objectives.

IV. TA/DA of the official members shall be borne by their respective Ministries/ Departments / Organizations.

V. The non-official members from outside Delhi are not entitled for any sitting fees, but are entitled for TA/DA, as admissible to a Joint Secretary rank officer in the Government of India for attending meetings. The local non- official members are entitled for sitting fees @ Rs.1000/- per day and Local Travel expenses subject to maximum of Rs.1200/ per day for taxi for attending the meetings of the Working Group.

The expenditure for **TA/DA and Sitting Fees** to the non-official members of the Working Group would be borne by the Ministry of Statistics and Programme Implementation, CSO, New Delhi under the Major Head 3454 Census, Surveys and Statistics (Major Head), 02 Surveys and Statistics (Sub Major Head), 02.204 Central Statistical Organization (Minor Head), 19 Capacity Development of CSO (Institutional Development and Capacity Building), **19.01.11 Domestic Travel Expenses and 19.01.20 Other Admn. Expenses** respectively under Grant No.91 for the year 2012-13 under Plan Scheme.

VI. The Working Group may submit its report within one year of issue of this notification.

VII. This issues with the concurrence of AS & FA, MoS&PI vide their Diary No 254/AS&FA dated 12/4/2012.

This notification will come into force with immediate effect.

(A. K. Sadhu)
Deputy Director General
Tel: 23766432
Fax No. 23312241

To

The Chairman & Members of the Working Group

Copy forwarded to:

(i) Senior PPS to the Secretary, MOP&PI
(ii) PPS to DG, CSO, MOS&PI
(iii) PPS to DG& CEO, NSSO, MOS&PI
(iv) Director (IFD), CSO, MOS&PI

(A. K. Sadhu)
Deputy Director General

ANNEXURE IA

File no. M-12018/6/2011-ESD
Government of India
Ministry of Statistics & Programme Implementation
Central Statistics Office
(Economic Statistics Division)

8th floor, Jeevan Prakash Building
25, K. G. Marg, New Delhi-110001.
Dated the 3rd of June 2013.

OFFICE MEMORANDUM

With approval of the competent authority, the tenure of the Working Group for development of methodology for compilation of all-India Index of Industrial Production, constituted vide an O.M. of even number, dated 4th May 2012, for one year from the date of issue of the O.M., is hereby extended by six months w.e.f. 5th May 2013.

2. The composition of the Working Group, as given at Para I of the aforesaid O.M., shall remain the same, except that the Member Secretary to the Working Group will be Shri. S. Chakrabarti, Deputy Director General, ESD, CSO in place of Sh. A. K. Sadhu, who has since been transferred from the CSO.

3. The terms of reference (TOR) and the provisions for payment of TA/ DA and sitting fees to the non-official members of the Working Group as were stated at Para II-V of the aforesaid O. M. shall remain unaltered during the extended period.

4. This issues with the concurrence of AS & FA, MoSPI vide his Diary No. 511/AS&FA/28.5.2013.

(G. S. Rathore)
Director
E-mail: gs.rathore@nic.in
Phone: 011-23705368

To

The Chairman and members of the Working Group

Copy to:

1. Sr. PPS to Secy., MoS&PI

(G. S. Rathore)
Director

ANNEXURE IB

File No. M-12018/6/2011-ESD
Government of India
Ministry of Statistics and Programme Implementation
Central Statistics Office
(Economic Statistics Division)

8th Floor, Jeevan Prakash Building
25, K. G. Marg, New Delhi – 110001.
Dated 6th November 2013.

OFFICE MEMORANDUM

With approval from competent authority, the tenure of the Working Group for development of methodology for compilation of all-India Index of Industrial Production, constituted vide O.M. of even number dated 4th May 2012, for a tenure of one year and extended by six months vide O.M. of even number dated 3rd June 2013, is hereby further extended upto 31st January 2014.

2. The composition of the Working Group, as given at Para I of the aforesaid O.M. dated 4th May 2012, with modification as indicated in Para 2 of the aforesaid O.M. of even number dated 3rd June 2013, shall remain unchanged.

3. The terms of reference (TOR) and the provisions for payment of TA/ DA and sitting fees to the non-official members of the Working Group as stated in Para II-V in the O. M. of even number dated 4th May 2012 shall remain unaltered during the extended period.

4. This issues with the concurrence of AS & FA, MoS&PI vide his diary number 1072/AS&FA/S&PI dated 25.10.2013.

(Geeta Singh Rathore)
Director
E-mail: gs.rathore@nic.in
Ph no: 011-23705368

To
The Chairman and members of the Working Group

Copy to:
1. Sr. PPS to Secretary, MoS&PI

(Geeta Singh Rathore)
Director

ANNEXURE IC

File No. M-12018/6/2011-ESD
Government of India
Ministry of Statistics and Programme Implementation
Central Statistics Office
(Economic Statistics Division)

8th Floor, Jeevan Prakash Building
25, K. G. Marg, New Delhi – 110001
Dated th February 2014

OFFICE MEMORANDUM

With approval from competent authority, the tenure of the Working Group for development of methodology for compilation of all-India Index of Industrial Production, constituted vide OM of even number dated 4th May 2012, for a tenure of one year and extended by OMs of even number dated 03.06.2013 and 03.11.2013, is hereby further extended up to 31st March 2014.

2. The composition of the Working Group, as given at Para I of the aforesaid O.M. dated 4th May 2012, with modification as indicated in Para 2 of the O.M. of even number dated 3rd June 2013, shall remain unchanged.

3. The terms of reference (TOR) and the provisions for payment of TA/ DA and sitting fees to the non-official members of the Working Group as stated in Para II-V in the O. M. of even number dated 4th May 2012 shall remain unaltered during the extended period.

4. This issues with the concurrence of AS & FA, MoS&PI vide his diary number 112/AS&FA dated 04.02.2014.

(Geeta Singh Rathore)
Director
E-mail: gs.rathore@nic.in
Ph no: 011-23705368

To
The Chairman and members of the Working Group

Copy to:
1. Sr. PPS to Secretary, MoS&PI

(Geeta Singh Rathore)
Director

ANNEXURE II

Manufacturing Sector Item Basket for 2009-10	
NIC 3 digit	**Item Group description**
Processing and Preserving of meat	
101	Buffalo Meat - Frozen, whether or not canned
	Poultry meat - Dressed & Frozen, whether or not canned
	Meat of all types other than buffalo/poultry meat - frozen, prepared/preserved / Canned
Processing and preserving of fish, crustaceans and molluscs	
102	Fish - Frozen
	Shrimps / Prawns - Processed/Frozen
Processing and preserving of fruits and vegetables	
103	Frozen /Preserved/ Prepared Mushrooms
	Fruit Concentrates & Juices
	Fruit Pulp (especially of mango & orange)
	Sauces of Vegetables (Tomato, Chili, Soy & others)
	Pickles of Mango
Manufacture of Vegetable and Animal Oils and fats	
104	Rice Bran Oil
	Cottonseed Oil
	Groundnut Oil
	Mustard & Rapeseed Oil
	Palm Oil - Refined
	Soybean Oil - Crude and Refined
	Sunflower Oil - Crude & Refined
	Coconut Oil
	Castor seed oil
	Vanaspati (vegetable fats)
	Oilseed cakes (oilcakes)
Manufacture of Dairy Products	
105	Flavoured Milk
	Full-cream/ Toned/ Skimmed milk, whether or not chilled
	Milk powder
	Butter
	Ghee
	Ice Cream

Manufacture of Grain milled products, starches and starch products	
106	Milled Rice
	Wheat flour (atta)
	Maida
	Rawa (sooji)
	Wheat bran
	gram dal
	Arhar dal, milled
	Gram powder (besan)
	Moong dal, milled
	Maize starch
Manufacture of Other food products	
107	Shelled cashew kernel, whether or not processed/ roasted/ slated
	Tea
	Coffee
	Spices, processed
	Sugar
	Molasses
	Bagasse
	Chocolate & cocoa powder
	Sugar confectionery (incl. sweetmeats)
	Bakery Products
	Malted food/ milk food product
	Noodles
	Papad
	Salt (incl. iodised salt)
Manufacture of prepared Animal feeds	
108	Fishmeal for poultry/aqua feeds
	Grain based cattle feed
Manufacture of beverages	
110	Beer & other un-distilled and fermented alcoholic liqueurs other than wines
	Spirits (Distilled alcoholic liqueurs)- whisky, gin, rum, vodka, etc.
	Toddy (or taddy)
	Bottled water
	Aerated drinks/ soft drinks (incl. soft drink concentrates)
	Wines
Manufacture of Tobacco products	
120	Cigarettes
	Bidi
	Other tobacco products

Spinning, Weaving and finishing of Textiles	
131	Cotton Yarn, grey, bleached, dyed, or otherwise processed including hosiery yarn
	Polyester spun yarn
	Rayon / Viscose blended Spun Yarn
	Polyester/Viscose blended spun yarn
	Other blended spun yarn
	Acrylic Yarn
	Woollen Yarn
	Cotton woven fabric
	Blended fabric
	Texturized polyester yarn
	Nylon yarn
	Polyester fabrics
	Polyester/Viscose blended fabric
	Jute sacking cloth/ Hessian fabric
Manufacture of Other Textiles	
139	Jute twine (Sutli)
	Jute twine/rope
	Sewing thread
	Elastic tape for all purposes
	Coir blocks
	Coir yarn
	Coir ropes and cordage
	Coir husk
	Knitted fabrics of cotton
	Woollen Carpets
	Carpets of nylon/ man-made fibre
	Cotton floor coverings and mats
	Made-up articles of textile materials other than bed-linen/ bed spreads
	Bed linen/ bedspread
	Fabrics (incl. sarees) inlaid with zari or embroidery works
	Shawls
	Terry Towels
	Sanitary towel and napkin
	Gunny bags
Manufacture of Wearing Apparel, except Fur Apparel	
141	Shirts/ bush shirts of cotton & blends
	Trousers/ pants of cotton & blends
	Undergarments of cotton & blends
	Leather garments
	Garments of blended fabrics and/or wool
Manufacture of knitted and crocheted apparel	
143	Knitted Garments, cotton

Tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness; dressing and dyeing of fur	
151	Tanned / dressed leather - Veg or Chrome tanned
	Travel goods of leather
	Hand bags for ladies, office bags of leather
	Wallets of leather
	Saddlery & Harness
	Gloves of leather
	Leather belts
Manufacture of footwear	
152	Shoes incl. boots of leather
	Chappals & open footwear of leather
	Footwear of PVC & other non-leather materials
	Leather Shoe Uppers
	Footwear components of Leather, incl. lining
Saw-milling and planing of wood	
161	Timber Sawn, Wooden Planks
Manufacture of products of wood, cork, straw and plaiting materials	
162	Veneer sheets
	Plywood block boards/particle board
Manufacture of paper and paper products	
170	Wood Pulp, including rayon grade
	Paper of all kinds
	Newsprint
	Paper products incl. of coated/ impregnated/ laminated paper
Printing and Service activities related to printing	
181	Books and Manuals
	Calendars & Publicity Material
	Journals/Periodicals
	Newspapers
Manufacture of coke oven products	
191	Coke Oven Products
Manufacture of refined petroleum products	
192	Liquefied Petroleum Gas (LPG)
	Aviation Turbine Fuel (ATF)
	Petrol/ motor spirit/ gasoline
	Kerosene
	High speed diesel
	Lubricating oil
	Furnace oil
	Naphtha
	Bitumen
	PET coke

Manufacture of basic chemicals, fertilizer and nitrogen compounds, plastics and synthetic rubber in primary forms	
201	Urea
	Nitrogenous fertilizers(excl. urea)
	Superphosphate
	Mixed inorganic fertilizers (N, P and K)
	Di-ammonium Phosphate (DAP)
	Manure and natural fertilizers
	Caustic soda (sodium hydroxide)
	Soda ash/ washing soda
	Sulphuric Acid
	Nitric Acid
	Titanium dioxide
	Liquid ammonia
	Ammonium sulphate
	Ammonium nitrate
	Ammonium phosphate
	Pure Terephthalic Acid (PTA)
	Monoethylene glycol, MEG
	Phthalic anhydride, PAN
	Acetic Acid
	Ethyl acetate
	Phenol or phenol extract
	Isopropyl alcohol
	Fatty Acid
	Fatty alcohol
	Formaldehyde
	Glycol (Ethylene/Propylene glycol)
	Organic acid (other than PTA, fatty acid and acetic acid)
	Monochlorobenzene
	Alkyl benzene
	Nitrochlorobenzene
	Polyethylene
	Polyacetals and other polymers
	Butadiene
	Poly propylene (PP)
	Polyvinyl Chloride (PVC)
	Polystyrene incl. Expandable Polystyrene (EPS)
	Dye stuff/ dyes incl. dye intermediates and pigments/ colours
	Rubber chemicals
	Synthetic resin (polyacetal, unsaturated polyester resin)
	Caprolactam
	Phenolic laminates

Manufacture of basic chemicals, fertilizer and nitrogen compounds, plastics and synthetic rubber in primary forms	
201	Polypropylene(PP) Sheet
	Polyester chips or Polyethylene terephthalate(PET) chips
Manufacture of other chemical products	
202	Gelatin
	Oleoresins food grade incl. spice oils/essential oils
	Leather finishing chemicals
	Plasticizer
	Antioxidants for Plastic industry
	Insecticides, Pesticides & other Agrochemicals for plant protection/growth
	Mosquito coil
	Printing ink
	Paints (all types)
	Thinner
	Varnish (all types)
	Perfumes/ scents/ deodorants
	Agarbatti (incense sticks)
	Detergent cake, washing soap cake/ bar
	Detergent powder and washing powder
	Toilet soap (excl. baby soap)- incl. liquid soap and foam
	Hair shampoo
	Tooth paste
	Creams and lotions for topical application
	Hair cream
	Hair dye
	Talcum powder
	Organic surface active agents/ surfactants, except soap (incl. dishwashing soaps, wetting and cleansing agents)
	Gun powder, detonators/ prepared explosives
	Fireworks/ pyrotechnic articles
	Safety matches (match box)
	Adhesive formulations other than natural gum
	Adhesive tape (non-medicinal)
Manufacture of man-made fibres	
203	Acrylic fibre
	Nylon Industrial Yarn/ Tyre cord, NTC
	Polyester Staple Fibre, PSF
	Rayon yarn
	Synthetic & nylon yarn waste

Manufacture of pharmaceuticals, medicinal chemicals and botanical products	
210	Isabgul (natural laxative preparations)
	Di-naphthyl Di-carboxylic Acid
	Benzoyl peroxide
	API & formulations of vitamins
	API & formulations of antibiotics
	Medicated shampoo
	Ayurvedic medicines & medicaments
	Anti-diabetic drugs excl. insulin (metformin, pioglitazone, glimepiride etc.)
	API & formulations of hypo-lipidemic agents incl. anti-hyper-triglyceridemics (simvastatin, atorvastatin, etc.)
	Anti-histamine, antistine, anthisian, antitussive (codeine etc.) API & formulations.
	Bandage/surgical cotton gauze, cotton wool, tape
	Contraceptive tablets
	API & formulations of antiseptics and disinfectants for topical application
	Antacid and digestive enzymes, anti-diarrheal API & preparations (formulations)
	Medicated toothpaste
	API & formulations for veterinary diseases
	Cotton wool (medicinal)
	Gelatin capsules- empty
	Anti-pyretic, analgesic/anti-inflammatory API & formulations
Manufacture of rubber products	
221	Tubes for Bicycle/ Tricycle/ Rickshaw tyres
	Tyres for Bicycle/ Tricycle/ Rickshaw
	Tubes for Scooter/ Motorcycle/ 3-wheelers tyres
	Tyres for Scooter/ Motorcycle/ 3-wheelers
	Tubes for Light Motor Vehicles (LMV) tyres
	Tyres for Light Motor Vehicles(LMV)
	Tractor tyres
	Tyres & tubes for Heavy Motor Vehicles (HMV) and trailers (incl. tubeless solid tyres)
	V belt
	Compound rubber for rubber-dipped fabrics
	Articles of Processed/ vulcanized rubber other than apparel & clothing accessories
	Rubber cloth/ sheet
	Rubber tread
	Rubber conveyer belts, transmission belts

Manufacture of Plastic Products	
222	Cross Linked Polyethylene (XLPE) material/ compound
	Low density Polythene (LDPE)/ High Density Polyethylene (HDPE) granules
	Films of polythene, polyester, PVC & other forms of plastic
	Acrylic sheets (including PVC, polystyrene / polycarbonate and other plastic sheets)
	Plastic components of packing/ closing/ bottling articles & of electrical fittings
	Polythene (PE)/ Polypropylene (PP) fabrics
	Pipes, tubes & conduits of plastic/ PVC
	Plastic crockery, kitchenware and tableware
	PVC fittings & other accessories
	Bags of HDPE/ LDPE (plastic)
	Sacks of plastic/ woven HDPE
	Drums/ Tanks of plastic/PVC
	Plastic bottles and containers
Manufacture of Glass and glass products	
231	Sheet Glass
	Glassware
	Signaling glassware
	Fibre glass
Manufacture of non-metallic mineral products n.e.c.	
239	Cement Clinker
	Cement- all types
	Prefabricated structural products of cement
	Ceramic tiles, flagstones & bricks
	Ceramic sanitary ware
	Electrical Insulators/ insulating fillings of ceramics/ porcelain
	Stone chips
	Polished granite
	Marble polished slabs
	Finished articles of marble
	Bricks & tiles (not ceramic)
	Abrasive grains/ products for grinding
	Graphite/ artificial graphite rods

Manufacture of basic iron and steel	
241	Sponge Iron/ Direct Reduced Iron (DRI)
	Ferrochrome
	Silico-manganese
	Ferro alloys (other than ferrochrome)
	Pig iron
	MS Ingots (incl. Pencil Ingots)
	Mild Steel (MS) Blooms
	MS Slabs
	MS Bars & Rods (incl. MS Bright bars)
	Angles, Shapes/ sections of Mild Steel (incl. Channels, Beams) whether or not coated/ slotted
	Steel Structurals
	Rails
	Hot Rolled (HR) Coils & Sheets, including narrow strip
	CR Coils & Sheets
	GP/GC Sheets & Coils and other coated steel
	MS/ Alloy Steel/ Stainless Steel Wires and wire rods
	Alloy Steel Ingots/ Billets and blooms/ Slabs
	Alloy-Steel Bars & Rods
	Stainless Steel Bars & Rods
	Stainless steel tubes and pipes
	Stainless steel Ingots / billets & blooms
Manufacture of basic precious and other non-ferrous metals	
242	Aluminium Billets/ingots
	Aluminium castings
	Aluminium alloys
	Aluminium disks/circles
	Aluminium foil
	Aluminium shapes
	Copper Billets/ ingots/ blocks
	Copper bars, rods & wire rods
	Copper electrodes
	Copper pipes/tubes and profiles/sections
	Zinc Ingots/blocks
	Lead bars ingots
	Gold bullion
	Brass plates/sheets/coils
	Other non-ferrous metal products
Casting of metals	
243	Cast iron castings
	Steel castings
	Galvanized iron pipes
	Pipes, tubes & poles of steel

Manufacture of structural metal products, tanks, reservoirs and steam generators	
251	Steel frameworks or skeletons for construction of towers
	Steel vessels/ containers including barrels, drums
	Gas cylinders (empty)
	Stainless steel tanks (incl. fuel tanks)
	Steel Boilers, not fitted with any device/equipment
	Pressure vessels and tanks other than boilers
	Heat exchangers
	Power generating equipment
	Air filters
	MS flat articles for building (e.g. doors, windows, shutters, etc.)
	Metal tubes & Pipes, other than steel, for steam and gas distribution equipment
Manufacture of weapons and ammunitions	
252	Guns
	Cartridges for guns and rifles
Manufacture of other fabricated metal products; metal working service activities	
259	Bolts and nuts, screws, nails
	Industrial fasteners
	Metal zip fastener (zipper)
	Metal caps & closures
	Sanitary fittings of iron/ steel
	Shaving razors/ razor blades
	Hand Tools incl. interchangeable tools, not mechanized
	Mechanized hand tools
	Stainless steel utensils
	Aluminium utensils (incl. non-stick)
	Pressure cooker
	Metal kitchenware other than utensils and pressure cookers
	Hinges
	Metal races for bearings in moving/ rolling devices
	Metal hoses
	Forged Steel Rings
	Steel Flange
	Casting products for machine parts
	Tin cans and containers
	Tungsten carbides
	Forging tools for machines
	Brass/ copper parts for machines
	Other fabricated metal parts for machines

Manufacture of electronic components	
261	Bare printed circuit boards (whether or not mounted with IC chips /components)
	Integrated Circuit Board (ICB)
	SIM Card
	Capacitors/ capacitance, resistors
	Electronic components for mobile telephones (other than PCBs/ ICBs/ SIM cards/ capacitors, etc.)
	Electric connectors/ plugs/ sockets/ holders
	Picture tube (colour)
Manufacture of computers and peripheral equipments	
262	CD/ DVD (video/ audio)
	Computer (desktops/ laptops)
	Computer printers/ scanners & other peripherals
Manufacture of communication equipment	
263	Radio/ TV studio, broadcasting and other telecom equipment (incl. TV Cameras)
	Mobile and fixed telephones
	Antenna/ aerial (incl. dish antenna)
	Telecom line modules
	Set top box for TVs
Manufacture of consumer electronics	
264	T.V. set
	Cameras (incl. video), whether or not digital
	Radios and VCD/ DVD players
	Air conditioners (ACs)
	Washing machines/ laundry machines
	Solenoid valves
Manufacture of measuring, testing, navigating and control equipment; watches and clocks	
265	Meters (electric and non-electric)
	Sensors for measuring, testing, navigating and control equipment
	Watches, automatic/quartz
	Watches, scientific/ digital & special purpose
	Clock/ Timepiece (all types)
Manufacture of irradiation, electro-medical and electrotherapeutic equipments	
266	X-ray film, unexposed
	X-ray equipment
	Sensors for irradiation, electro-medical and electrotherapeutic equipments
Manufacture of optical instruments and equipments	
267	Microscope
	Sunglasses
	Binoculars

Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus	
271	Generators / Alternators
	A C Motor
	Electric Motor Starters
	Switches (on/off, volume control)
	Automation systems for industrial processes
	Transformers
	Electrical apparatus for switching or protecting electrical circuits (e.g. switchgear, circuit breakers/switches, control/ meter panel)
	UPS in Solid State Drives
	Trans-receiver set, all types other than telephones (e.g. walkie-talkie/ CB radio/ RF or HF trans-receivers)
Manufacture of batteries and accumulators	
272	Batteries
Manufacture of wiring and wiring devices	
273	Electronic/ electrical conductor wires (single or multiple strands)
	End facing connector
	Jelly Filled Cables
	PVC Insulated Cable
	Rubber Insulated Cables
	ACSR Conductors
	Fiber optics/ optical fiber cables
Manufacture of electric lighting equipments	
274	Electrical ballast & chokes
	Compact Fluorescent Lamps (CFL)
	Fluorescent Tubes
	Incandescent Lamps
	Mercury vapour lamps
	Neon lamps
	Electric filament type lamps
	Automotive lamps / miniature lamps
Manufacture of domestic appliances	
275	Electric Water heaters/ geysers (domestic)
	Non-electric heating appliances for cooking (e.g. gas stove)
	Domestic Air cooling unit (excl. air conditioner)
	Refrigerators and freezers for domestic use
	Electric cooking appliances (e.g. toasters, mixers/grinders, food processors)
	Ceiling or table or pedestal fans (other than industrial fans/exhaust fans)
	Liquid Crystal Display (LCD)/ Light Emitting Diode (LED)

Manufacture of other electrical equipments	
279	Carbon brushes and brush holders
	Electrical steel laminations
	DC power supply
	Electric Welding Rods
	Flashlight / torch
	Propeller fans
	Direction finding compasses; other navigational instruments and appliances
Manufacture of General purpose machinery	
281	Furnaces (incl. electric furnaces)
	Industrial Valves of different types- safety, relief and control valves(non-electronic, non-electrical)
	Pulleys excl. tackles
	Roller and ball bearings
	Air/ gas compressors of all types (incl. compressors for refrigerators)
	Turbo Chargers or turbine powered boosters
	Actuators using electric, hydraulic or pneumatic power
	Gear boxes incl. geared motors
	Material handling, lifting and hoisting equipment
	Cranes - all types
	Conveyors - non-roller type
	Packing Machine
	Diesel engines
	Filtration Equipment
	Pumps of all types (centrifugal & other velocity pumps; hydraulic & other impulse pumps; positive displacement pumps-gear/screw pumps; gravity pumps; steam pumps & boiler feed pumps; valve less pumps)
	Hydraulic equipment (other than pumps) for lifting/ displacement purposes
	Steam & other vapour turbines
	Air preheater, super-heater/ steam dryer, economizer for boiler/ engines/ power plant equipment
	Chillers (incl. cooling towers) for industrial applications
	Air Conditioner - window / split type
	Solar power system (solar panel & attachable equipment)
	Wind turbine or engine (incl. wind mill)
Manufacture of special-purpose machinery	
282	Sewing machines
	Textile/ Leather Machinery
	Machinery/ equipment for Chemical & Pharmaceutical Plants (typical-other than food processing machinery)
	ATM (automatic teller machines)
	Moulding machine
	Separators- for agricultural products

Manufacture of special-purpose machinery	
282	Road rollers
	Lathes
	Machine tools for turning, drilling, milling, shaping, planning, boring, grinding etc. (other than lathes)
	Soil preparation & cultivation machinery (other than tractors)
	Dairy & food processing machinery
	Sugar Mill Machinery
	Raymond roller mill
	Loaders -tracked & wheeled loaders
	Agriculture implements
	Harvesters
	Threshers
	Agricultural Tractors
	Excavators
	Construction machine/ equipment (incl. bull-dozers)
	Dumpers
	Concrete Mixer Lorries
	Machinery & equipment for defense support
Manufacture of motor vehicles	
291	Passenger vehicles (LMV)
	Other commercial vehicles (such as vans, lorries, over-the-road tractors for semi-trailers etc.)
	Chassis for buses/ trucks
Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	
292	Bodies for motor vehicles (all types)
	Commercial vehicles for passenger transport (HMV/MMV)
Manufacture of parts and accessories for motor vehicles	
293	Auto Components/ spares and accessories
	Meter Assembly for motor vehicles
	Hydraulic car lifts
	Air conditioner for motor vehicles
Building of ships and boats	
301	Propellers & Blades thereof for Boats / Ships
	Fishing vessels incl. vessels for processing/ preserving fish products
	Cargo vessels (excl. fishing vessels, pleasure & sporting boats and navy ships/vessels)
Manufacture of railway locomotives and rolling stock	
302	Railway signaling equipment-electrical/ mechanical
	Parts of railway/ tramway locomotive or rolling stock
	Railway wagons
	Rail & tramway tracks
	Railway coaches
	Locomotives

Manufacture of air and spacecraft and related machinery	
303	Air reservoir for air crafts
	Cargo aircraft
	Aircrafts for special use
Manufacture of transport equipment n.e.c.	
309	Wheels for LMV/HMV
	Two-wheelers
	Passenger carriers-three wheeler
	Bicycles - of all types
Manufacture of furniture	
310	Mattresses made of foam/ LRPu, coir or rubberized coir
	Wooden Furniture
	Steel Furniture
	Padlocks and locks, door closing/safety devices
Manufacture of jewellery, bijouterie and related articles	
321	Cut & Polished diamonds
	Jewellery of gold
	Gold medallion
Manufacture of musical instruments	
322	Guitar - all types
Manufacture of sports goods	
323	Sports goods of rubber
	Cricket Ball
	Cricket Bat
	Hockey Stick
	Table Tennis Table
	Football
Manufacture of games and toys	
324	Playing Cards
	Games & Toys (excl. video games machines & other mechanical/ electrical equipment for gaming parlours/ fairs)
Manufacture of medical and dental instrument and supplies	
325	Dentist Chairs
	Syringes- all types
	Intraocular lens
	Ophthalmic lens

Other manufacturing n.e.c.	
329	Ink for writing pens
	Safety vault/ locker (incl. armoured/ reinforced boxes & lockers)
	Nibs and Pen tips
	Human hair- articles thereof
	Ball pen refills
	Ball pen (incl. gel ink pen) with/ without refill
	Marker pen/ highlighter
	Pens(excl. ball pens)
	Pencils (incl. colour pencils)
	Staplers

ANNEXURE III

2-digit (NIC-wise) distribution of number of products phased out from previous basket and their weights in previous series (2004-05)

NIC 2 digit	Description	Number of products dropped	Weights (out of 1000)
15	Food products and beverages	7	2.25
16	Tobacco products	2	0.94
17	Textiles	7	0.80
18	Wearing apparel; dressing and dyeing of fur	0	0.00
19	Luggage, handbags, saddlery, harness & footwear; tanning and dressing of leather products	9	0.29
20	Wood and products of wood & cork except furniture; articles of straw & plating materials	1	0.00
21	Paper and paper products	5	0.85
22	Publishing, printing & reproduction of recorded media	0	0.00
23	Coke, refined petroleum products & nuclear fuel	1	0.93
24	Chemicals and chemical products	39	41.82
25	Rubber and plastics products	6	1.61
26	Other non-metallic mineral products	6	3.16
27	Basic metals	16	13.69
28	Fabricated metal products, except machinery & equipment	5	0.83
29	Machinery and equipment n.e.c.	11	6.38
30	Office, accounting & computing machinery	4	0.61
31	Electrical machinery & apparatus n.e.c.	9	1.38
32	Radio, TV and communication equipment & apparatus	5	0.71
33	Medical, precision & optical instruments, watches and clocks	4	1.07
34	Motor vehicles, trailers & semi-trailers	10	11.64
35	Other transport equipment	6	1.38
36	Furniture; manufacturing n.e.c.	4	0.51
	TOTAL	157	90.84

ANNEXURE IV

Item basket for Minerals (provided by IBM) for the Base Year 2009-10

NIC 2 digit level	Sr No	Mineral	Value-0910 (in Rs'000)	% GVO	Remarks
05		**Coal & Lignite**	**550,938,500**	**100.000**	
	1	Coal	513,182,500	93.147	
	2	Lignite	37,756,000	6.853	
06		**Petroleum & Natural Gas**	**785,645,826**	**100.000**	
	1	Petroleum(crude)	607,894,611	77.375	
	2	Natural Gas (ut.)	177,751,215	22.625	
07		**Metallic**	**313,949,266**	**100.000**	
	1	Iron Ore	264,620,052	84.288	
	2	Zinc Conc.	13,058,419	4.159	
	3	Manganese Ore	11,905,233	3.792	
	4	Chromite	10,453,620	3.330	
	5	Bauxite	4,887,897	1.557	
	6	Copper Conc.	3,809,462	1.213	
	7	Gold	3,425,814	1.091	
	8	Lead Conc.	1,765,874	0.562	
	9	Tin Conc.	22,895	0.007	
08		**Non-Metallic**	**46,600,886**	**100.000**	
	1	Limestone	32,477,596	69.693	
	2	Phosphorite	3,103,095	6.659	
	3	Barytes	2,601,842	5.583	
	4	Dolomite	1,672,224	3.588	
	5	Gypsum	1,004,631	2.156	
	6	Garnet (abrasive)	763,377	1.638	
	7	Steatite	713,708	1.532	
	8	Kaolin	676,728	1.452	
	9	Magnesite	435,118	0.934	
	10	Silica Sand	408,559	0.877	
	11	Marl	381,599	0.819	New Product proposed
	12	Sillimanite	258,779	0.555	
	13	Ochre	226,881	0.487	
	14	Ball Clay	218,174	0.468	
	15	Laterite	177,376	0.381	
	16	Pyroxenite	152,371	0.327	
	17	Diamond	116,279	0.250	

NIC 2 digit level	Sr No	Mineral	Value-0910 (in Rs'000)	% GVO	Remarks
	18	Wollastonite	111,930	0.240	
	19	Sand (others)	101,399	0.218	
	20	Feldspar	98,648	0.212	
	21	Quartz	95,759	0.205	
	22	Fireclay	89,680	0.192	
	23	Shale	89,288	0.192	
	24	Clay (others)	71,294	0.153	
	25	Chalk	71,087	0.153	
	26	Pyrophyllite	60,425	0.130	
	27	Lime Kankar	58,754	0.126	
	28	Graphite (r.o.m.)	53,830	0.116	
	29	Limeshell	50,917	0.109	
	30	Mica (crude)	39,940	0.086	
	31	Quartzite	37,377	0.080	
	32	Diaspore	27,422	0.059	
	33	Fluorite(graded)	60,944	0.131	
	34	Dunite	19,281	0.041	
	35	Calcite	16,980	0.036	
	36	Apatite	12,911	0.028	
	37	Selenite	12,408	0.027	
	38	Asbestos	12,268	0.026	
	39	Vermiculite	7,653	0.016	
	40	Kyanite	5,812	0.012	
	41	Salt (rock)	4,908	0.011	
	42	Felsite	1,608	0.003	

ANNEXURE V

Mode of data collection (sample/census) and mode of receipt of data by source agencies

Sl No	Source Agency Name	Items for which data is collected through sampling	Items for which data is collected through census	Mode of data collection
1	Ministry of Petroleum & Natural Gas	NIL	1. Bitumen 2. High Speed Diesel (HSD) 3. Light Diesel Oil (LDO) 4. Aviation Turbine Fuel (ATF) 5. Furnace Oil (FO) 6. Liquefied Petroleum Gas (LPG) 7. Kerosene (SKO) 8. Naphtha 9. Lubricating Oil 10. Motor Spirit (MS) or Petrol 11. Petroleum Coke	Data collected electronically, by e-mail, by FAX and by Post
2	Office of Coal Controller	1. Washed Coal 2. Middlings 3. Hard Coke	NIL	Data collection is done by email/ fax
3	Joint Plant Committee	All units producing a particular item not covered; only representative sample is covered.	NIL	Online web based system is used for data collection.
4	Department of Chemicals and Petrochemicals	All large and medium scale units are covered. However, after recent interaction with chemical associations/ council, it is observed that a few units producing pesticides (technical), Polyester Filament Yarn (PFY) are not covered.	NIL	Monthly Production returns from the companies are received by e-mail/ Fax/Post.
5	Directorate of Sugar	NIL	All sugar mills are required to furnish the data on monthly basis. However, sugar production activity under Advance License Scheme (i.e. import of raw sugar and export of refined sugar) is not captured.	Data is collected online through a web-portal.

Sl No	Source Agency Name	Items for which data is collected through sampling	Items for which data is collected through census	Mode of data collection
6	Central Electricity Authority	NIL	Covers practically the whole of electricity generated in the country except for very small units which contribute to less than 1% of the total generation.	Data is collected on a daily basis through a web based user interface Sometimes data is also collected through fax and email.
7	Office of Salt Commissioner	NIL	Yes, all the units producing the item are covered.	Data is collected through correspondence and field visits.
8	Department of Industrial Policy and Promotion	Data for all 268 items supplied by DIPP is collected from a representative sample of all the units producing a particular item.		Data is collected through post, fax and email. Efforts are onto develop a web based system to collect monthly data.
9	Office of the Textile Commissioner		All the units producing the items listed below are covered. The production of the rest of the items is indirectly estimated Cotton yarn Non-cotton yarn Viscose staple fibre Polyester staple fibre Acrylic fibre Nylon yarn Synthetic yarn Rayon yarn	Data collected through postal correspondence.

Sl No	Source Agency Name	Items for which data is collected through sampling	Items for which data is collected through census	Mode of data collection
10	Indian Bureau of Mines		All units reporting production of MCDR minerals are covered. Production data for Coal& Lignite and Petroleum & Natural Gas are received from the Office of Coal Controller and the Ministry of Petroleum & Natural Gas respectively	Data is received through the Regional Offices of IBM located at various places. Efforts are on to develop a web based system to collect monthly data
11	Directorate of Vanaspati, Vegetable Oils and Fats	Yes		Data is collected through correspondence.
12	Tea Board		Data is collected from every registered tea manufacturer holding a factory license from Tea Board.	Data is collected through email and field visits.
13	Coffee Board	The total production of Coffee in the country is estimated by measuring the production of a sample.		Data is collected through field visits.
14	Office of Jute Commissioner		All working mills are covered	Data is collected through field visits

ANNEXURE VI

Concept note for developing a web portal for online data collection and compilation of Index of Industrial Production

Introduction:

Index of Industrial Production (IIP) is a summary indicator that measures the short-term changes in the volume of industrial production during a given period with respect to that in a chosen base period. This quantity index is brought out monthly by Central Statistical Office (CSO) on the 12th of every month. IIP for a month is initially released as Quick Estimate with a time lag of six weeks from the reference month. It undergoes First revision after one month and Final revision after three months of releasing the quick estimate. The general index of industrial production compiled in India covers the sectors Mining, Manufacturing and Electricity. IIP is also compiled for the Use-based categories namely, Basic Goods, Capital Goods, Intermediate Goods, Consumer Durables and Consumer Non-durables.

Currently IIP is undergoing the process of Base Year Revision. In the new base year, production data for compilation of IIP is proposed to be directly collected from manufacturing units by CSO. For this purpose, CSO proposes to develop a web-based system wherein, a simple and user-friendly guided-user interface (GUI) may be installed at the location of the manufacturing unit to key in the production data every month, which will get uploaded on a central server, the overall responsibility and location of which will lie with Economic Statistics Division (CSO).

The format in which data will be uploaded by units is given in Table A.I.

TABLE A.I: FORMAT FOR SUPPLYING MONTHLY PRODUCTION DATA

Sl. No.	Item of production	Unit	Production		
			Current month	Previous month	Previous 3rd month
1	2	3	4	5	6

Compilation of index: IIP for a particular item group is calculated as production relative (production for current month of all units selected for that item group divided by the base year production) multiplied by 100. Then, the consolidated indices at National Industrial Classification (NIC) 4-digit, 3-digit, 2-digit and sectoral levels is calculated as weighted arithmetic mean using Laspeyre's fixed-base formula, which is expressed mathematically as follows:

$$L_t = \frac{\sum R_i W_{i0}}{\sum W_{i0}} * 100$$

Where

W_{i0} = Weight of the ith item in the base year

R_i = Production relative of the ith item= P_{it} / P_{i0}

P_{it} = Production of the ith item in the period t

P_{i0}= Production of the ith item in the base period

Similarly indices for use-based categories are also arrived at by weighted arithmetic mean. Relevant reports are then generated using the compiled indices.

Proposal for development of web portal:

In order to facilitate the compilation and release of the index and to effectively reduce the time taken in achieving the said objectives, the web portal is required to perform the following functions:

MODULE I

- DATA INPUT:
  - A user-friendly menu-driven interface for the manufacturing units to upload the data-
    - Access allowed for every unit with an authenticated username and password- the authentication details of the unit will be linked to the items produced by the unit (col.2 of table I will be auto-generated).
    - Should display 4 different pages/ tabs for uploading data for current month, previous month and 3rd previous month along with displaying the previous years' data (non-editable) of the particular unit.
  - The portal will be available for data entry to the units between 1st -10th of every month succeeding the reference month.
  - Periodic reminders will be issued through SMS/ e-mail to the unit manager till data is uploaded.

- VALIDATION CHECKS AT INPUT-END:

  – Perform initial validation checks while entering data and flashing message/ prompts pointing out range overflow and get necessary details for reasons of overflow.

    The following methods are to be used for initial validation:

    - An additional column asking for installed capacity of the unit.
    - Data for the current month is compared with the previous year same month- should lie within ±30% limits or within the confidence limits defined by (μ±3σ), whichever is lower, where μ is the mean of the previous time series and σ is the standard deviation of the previous time series of production.
    - Data for current month is also compared with the previous month's data: should lie within ± 20% limits or within the confidence limits defined by (μ±2σ), whichever is lower, where μ is the mean of the previous time series and σ is the standard deviation of the previous time series of production.
    - Data for previous month is compared with its QE data: should lie within ± 20% limits or within the confidence limits defined by (μ±2σ), whichever is lower, where μ is the mean of the previous time series and σ is the standard deviation of the previous time series of production.
    - Data for previous 3rd month is compared with its First Revision data: should lie within ±10% limits or within the confidence limits defined by (μ±σ), whichever is lower, where μ is the mean of the previous time series and σ is the standard deviation of the previous time series of production.

Note: a. *Zero values as and when they arise (due to non-reporting), in time series may be neglected for the purpose of calculating confidence limits.*

b. Seasonal items will be identified and their confidence limits will be calculated via separate methodology using moving averages.

c. Prompts/ message boxes when value entered falls outside the limits may be followed up with an input box containing a drop-down for reasons of rise/fall of the value. Reasons will include:

(a) increase / decrease in installed capacity

(b) increase / decrease in capacity utilization (non-seasonal)

(c) seasonal variation

(d) contingent events (to be specified) and

(e) any other-please specify.

- List the items not conforming to the initial validation checks after confirmation by the respective units and flow-back to central server with reason riders of overflow.

- AUTHENTICATION/VETTING BY CONTROLLING MINISTRY/DEPTT.

  - The portal will be accessible by designated agencies, which may be a Ministry or its department and other bodies having administrative control on the affairs of the manufacturing units supplying data for IIP.
  - After the data is input by the units, the portal will be made accessible for a pre-specified period of every month to the controlling agency between 10^{th} and 20^{th} of every month succeeding the reference month with user authentication by making visible production data with unit particulars for the units under control of the particular agency only.
  - The controlling agency will be asked to authenticate the data from their own source and report anomalies, if any, with the details of the error and the corrected production figures. Data editing at this stage will not be carried out on the original database but will create a correction file that will subsequently be used by CSO for database updation.
  - The *interface for the vetting agency* will include
    - Unit of manufacturing
    - Production figures for current month
    - Production figures for previous month
    - Production figures for previous 3^{rd} month
    - Any rider reported by unit for high/low production
    - A Drop-down beside each unit's data reported row for declaring whether data reported is correct or not.
    - If a data is reported to be wrong, a row inserted below the wrongly reported data for feeding the details and both these rows will be reported in central server with identification
    - If all data is reported correct, a link will get enabled to a form for vetting and authentication certificate where a pre-specified format will be fed as declaration by the agency that the data reported by units is correct and authentic as per their sources.

MODULE II

- Data of each unit will flow to central server after authentication by controlling agency with riders and correction file, if any as above
- Compilation of item level, NIC 4-digit, 3-digit, 2-digit, sectoral and use-based indices using the aforementioned formula.
- Preparation and updation of three separate DATABASES for both production data and indices for Quick Estimate, First Revision and Final Revision.
- Preparation of ITEM-LEVEL ANNUAL INDICES and GRAPHS updated till the latest month and tables computing contribution of each item towards the overall growth of the index.
- Generation of final REPORTS. With the existing system, about 20 reports are being generated after finalization of IIP figures. Once web portal is introduced, format and number of reports may change.

MODULE III

- Creation of a *Relational* Data Base Management System (RDBMS) at the back end for storage of time series data and reports of previous releases.
- This back end will be linked to an open portal for data users with an interface for customized data download (with link to a payment portal) in requested file formats.

ANNEXURE VII

Method of estimation adopted in case of non-response in source agencies for current series

Sl. No.	Source Agency Name	Method of estimation
1	Ministry of Petroleum and Natural Gas	Average of previous 3 months production data of the unit
2	Office of Coal Controller	Previous month's data is repeated
3	Joint Plant Committee	Non-receipt of previous months while the current month data is available: The total production of the non-receipt period is determined from the current month's reported cumulative totals and distributed equally for the previous months of estimation. Non-receipt of current months while previous month's figures are available: The average monthly production for the period of receipt is worked out and used for the non-receipt in succeeding period(s). Non-receipt for the whole year / New Units: State wise capacity utilization is determined for the reporting units. On the basis of this, the production is estimated for the non-reporting working units.
4	Department of Chemicals and Petrochemicals	Previous month's data is repeated.
5	Directorate of Sugar	No estimation is done
6	Central Electricity Authority	No estimation is done
7	Office of Salt Commissioner	No estimation is done
8	Department of Industrial Policy and Promotion	Last reported figure is repeated
9	Office of the Textile Commissioner	Last reported figure is repeated.
10	Indian Bureau of Mines	Average of previous 3 months production data of the unit

Sl. No.	Source Agency Name	Method of estimation
11	Directorate of Vanaspati, Vegetable Oils and Fats	Formula used for estimation: Production of Non responding Units= {Pr / Tr* (T-Tr) } X 75#/100 Where: Pr = Production of Responding units Tr = Total no. of responding units T= Total no of units currently functioning #: 80 for certain items
12	Tea Board	Production is estimated by raising the reported production of respondent tea manufacturing units to 100% on the basis of the performance of production of reporting units for the month of current year vis-à-vis previous year.
13	Coffee Board	NA
14	Office of Jute Commissioner	No estimation is done

ANNEXURE VIII

NIC 2 digit wise re-distributed weights for items in comparative exercise of IIP with ASI (Approach I)
(Reference: Chapter V)

NIC-2004 2 digit code	Number of items	Original weight in IIP (out of 1000)	Rescaled weight for comparison (out of 1000)
15	17	58.31	96.29
16	2	13.76	22.72
17	9	46.98	77.57
18	2	27.82	45.94
19	1	1.31	2.56
20	3	9.76	16.11
21	3	7.65	12.63
22	1	10.09	16.66
23	12	64.95	107.26
24	16	61.27	101.18
25	7	14.51	23.96
26	8	39.80	65.72
27	22	91.61	151.28
28	6	23.96	39.56
29	11	24.76	40.89
30	1	2.33	3.85
31	7	11.81	19.50
32	4	9.31	15.37
33	2	2.18	3.60
34	2	39.08	64.54
35	4	15.96	26.36
36	4	28.37	46.86
Total	**144**	**605.58**	**1000**

ANNEXURE IX

Results of T-tests and F-test for comparative exercise between ASI and IIP
(Approach II)
(Reference: Chapter V)

Table A.2
Summary of one sample t-test
(a): One-Sample Test for ratios of production 2008-09

	Test Value = 0					
	T	**df**	**Sig. (2-tailed)**	**Mean Difference**	**95% Confidence Interval of the Difference**	
					Lower	**Upper**
Ratio 08_09	1.36	105	.18	2.25	-1.03	5.52

(b): One-Sample Test for ratios of production 2009-10

	Test Value = 0					
	T	**df**	**Sig. (2-tailed)**	**Mean Difference**	**95% Confidence Interval of the Difference**	
					Lower	**Upper**
Ratio 09_10	1.57	105	.12	39.42	-10.24	89.09

Table A.3
Summary of F-test for testing volatility of growth rates of ASI and DIPP

F-Test Two-Sample for Variances		
	GR (ASI)	**GR (DIPP)**
Mean	102.84	3.99
Variance	759021.65	1593.67
Observations	106	106
df	105	105
F	476.27	
P(F<=f) one-tail	3.2824E-111	
F Critical one-tail	1.38	

ANNEXURE X

Weighting diagram for the revised series with Base Year 2009-10 at 2/3/4 digit levels of NIC 2008

NIC 2 digit	Description	Weights	NIC 3 digit	Weights	NIC 4 digit	Weights
10	Manufacture of food products	5.1925	101	0.1125	1010	0.1125
			102	0.1088	1020	0.1088
			103	0.1343	1030	0.1343
			104	0.6674	1040	0.6674
			105	0.5983	1050	0.5983
			106	1.0475	1061	0.9586
					1062	0.0890
			107	2.3685	1071	0.2853
					1072	0.9047
					1073	0.1984
					1074	0.0444
					1075	0.1093
					1079	0.8264
			108	0.1552	1080	0.1552
11	Manufacture of beverages	1.0355	110	1.0355	1101	0.3708
					1102	0.1271
					1103	0.2461
					1104	0.2915
12	Manufacture of tobacco products	0.8994	120	0.8994	1200	0.8994
13	Manufacture of textiles	4.2184	131	3.4672	1311	2.2495
					1312	0.6798
					1313	0.5379
			139	0.7511	1391	0.1824
					1392	0.2503
					1393	0.0599
					1394	0.0934
					1399	0.1651

NIC 2 digit	Description	Weights	NIC 3 digit	Weights	NIC 4 digit	Weights
14	Manufacture of wearing apparel	1.6196	141	1.1920	1410	1.1920
			142	0.0055	1420	0.0055
			143	0.4220	1430	0.4220
15	Manufacture of leather and related products	0.6373	151	0.2231	1511	0.1141
					1512	0.1090
			152	0.4142	1520	0.4142
16	Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	0.1845	161	0.0101	1610	0.0101
			162	0.1744	1621	0.1256
					1622	0.0187
					1623	0.0000
					1629	0.0301
17	Manufacture of paper and paper products	0.9118	170	0.9118	1701	0.3707
					1702	0.2939
					1709	0.2473
18	Printing and reproduction of recorded media	0.7369	181	0.6939	1811	0.6579
					1812	0.0360
			182	0.0431	1820	0.0431
19	Manufacture of coke and refined petroleum products	8.4512	191	0.2677	1910	0.2677
			192	8.1835	1920	8.1835
20	Manufacture of chemicals and chemical products	7.7354	201	4.4109	2011	1.7821
					2012	1.0302
					2013	1.5986
			202	3.1237	2021	0.7068
					2022	0.5283
					2023	0.9535
					2029	0.9351
			203	0.2007	2030	0.2007
21	Manufacture of pharmaceuticals, medicinal chemical and botanical products	4.6018	210	4.6018	2100	4.6018

NIC 2 digit	Description	Weights	NIC 3 digit	Weights	NIC 4 digit	Weights
22	Manufacture of rubber and plastics products	2.9841	221	1.2386	2211	0.9565
					2219	0.2821
			222	1.7455	2220	1.7455
23	Manufacture of other non-metallic mineral products	5.5385	231	0.2964	2310	0.2964
			239	5.2421	2391	0.4109
					2392	0.2240
					2393	0.2443
					2394	3.3801
					2395	0.4530
					2396	0.2810
					2399	0.2488
24	Manufacture of basic metals	10.8593	241	8.6564	2410	8.6564
			242	1.1938	2420	1.1938
			243	1.0091	2431	0.9072
					2432	0.1020
25	Manufacture of fabricated metal products, except machinery and equipment	3.0725	251	1.7808	2511	0.8406
					2512	0.2262
					2513	0.7140
			252	0.0202	2520	0.0202
			259	1.2715	2591	0.1838
					2592	0.1283
					2593	0.4151
					2599	0.5442
26	Manufacture of computer, electronic and optical products	2.5525	261	0.6197	2610	0.6197
			262	0.3065	2620	0.3065
			263	0.5491	2630	0.5491
			264	0.5098	2640	0.5098
			265	0.3822	2651	0.2512
					2652	0.1311
			266	0.0895	2660	0.0895
			267	0.0173	2670	0.0173
			268	0.0783	2680	0.0783

NIC 2 digit	Description	Weights	NIC 3 digit	Weights	NIC 4 digit	Weights
27	Manufacture of electrical equipment	3.7738	271	1.7137	2710	1.7137
			272	0.5444	2720	0.5444
			273	0.7067	2731	0.0985
					2732	0.3296
					2733	0.2785
			274	0.1839	2740	0.1839
			275	0.4503	2750	0.4503
			279	0.1749	2790	0.1749
28	Manufacture of machinery and equipment n.e.c.	5.3152	281	3.1972	2811	1.3214
					2812	0.2095
					2813	0.4517
					2814	0.4199
					2815	0.0723
					2816	0.2364
					2817	0.0058
					2818	0.0059
					2819	0.4744
			282	2.1180	2821	0.6193
					2822	0.1192
					2823	0.0280
					2824	0.3793
					2825	0.1484
					2826	0.1673
					2829	0.6565
29	Manufacture of motor vehicles, trailers and semi-trailers	5.1797	291	2.2324	2910	2.2324
			292	0.1220	2920	0.1220
			293	2.8253	2930	2.8253

NIC 2 digit	Description	Weights	NIC 3 digit	Weights	NIC 4 digit	Weights
30	Manufacture of other transport equipment	2.2744	301	0.4100	3011	0.4097
					3012	0.0003
			302	0.2789	3020	0.2789
			303	0.0159	3030	0.0159
			304	0.0013	3040	0.0013
			309	1.5684	3091	1.4608
					3092	0.1000
					3099	0.0076
31	Manufacture of furniture	0.2160	310	0.2160	3100	0.2160
32	Other manufacturing	0.9759	321	0.6163	3211	0.6082
					3212	0.0081
			322	0.0042	3220	0.0042
			323	0.0197	3230	0.0197
			324	0.0144	3240	0.0144
			325	0.1526	3250	0.1526
			329	0.1687	3290	0.1687
33	Repair and installation of machinery and equipment	0.2152	331	0.1791	3311	0.0498
					3312	0.0596
					3313	0.0013
					3314	0.0045
					3315	0.0597
					3319	0.0043
			332	0.0361	3320	0.0361
Total		79.1814	Total	79.1814	Total	79.1814

ANNEXURE XI

Minutes of the First Meeting of the Working Group for Development of Methodology for compilation of All India Index of Industrial Production (IIP)

First meeting of the Working Group for Development of Methodology for compilation of All India Index of Industrial Production (IIP) was held on 30th May 2012 at Planning Commission under the Chairmanship of Dr. Saumitra Chaudhuri, Member, Planning Commission. All the members introduced themselves in terms of their role as user or producer of data for IIP.

The Chairman opened the discussion by emphasizing the importance of IIP. He said IIP, being a high-frequency indicator, is extremely relevant to depict the economic scenario in the country. He highlighted this meeting as a good opportunity to revise and try to improve the different aspects involved in the compilation of IIP. The Chairman also put forth the following issues for further deliberations:

- Shifting of the present base year (2004-05) to a more recent base.
- Having different indices for certain sets of commodities and aggregating them to get the overall IIP.
- Shifting to a chain-based approach rather than the currently followed fixed-base approach.
- Make suitable changes in data collection to suit the requirement of factories keeping in view the MIS maintenance in these units.

A. K. Sadhu, DDG, CSO (ESD) & Member Secretary gave a power point presentation on the system of compilation of current series of IIP. Scope, periodicity, item basket, system of data collection, computation formula and method of dissemination of IIP was discussed in the presentation. Methodology adopted for selection of item basket and deriving weighting diagram for the base year 2004-05 was explained in details to the members. He also brought out salient changes made from 1993-94 series to 2004-05 series of IIP.

Member Secretary underlined the necessity to revise the IIP periodically by shifting its base to a more recent period in order to capture the changes in the structure and composition of the industry over time. Although the base year of the old series of IIP has been shifted from 1993-94 to 2004-05 only in June 2011, yet it is quite old (more than 6 years), and as such the current series may not be able to appropriately capture the structural changes in industry. Therefore, necessity is being felt to revise the IIP series again to a more recent base period. As per National Statistical Commission's recommendation, base year of all the index numbers (WPI, CPI, IIP etc.) should be revised every five years. As such, IIP base year revision is due for shifting to the year

2009-10. He informed that one of the recommendations made by the Working Group, constituted under the Chairmanship of Dr. R. Nagaraj, is to shift the base year of IIP from 2004-05 to 2009-10. He also informed about various recommendations regarding system of data collection made by Dr. N. S. Sastry who conducted Statistical Audit at the behest of NSC. The audit report should also be considered when revision of base year of IIP is undertaken.

In the above background, he informed the terms of reference (ToR) of the present Working Group which are as follows:

(a) To review the existing methodology for compilation of All India Index of Industrial Production (IIP) and suggest improvements in the context of international practices.

(b) To consider the Report of the Standing Committee on Industrial Statistics regarding selection of base year (2009-10) of the index and also to examine possibility of using chain base index.

(c) To finalize weighing diagram for IIP and selection of item basket for the purpose.

(d) To identify agencies for collection of production data for the purpose of compilation of IIP and also to examine feasibility of integration of data collection for IIP and WPI for common set of factories.

(e) To suggest procedures for substitution of factories in case of closure or change in production line and also to suggest measures to suitably take into account new large sized factories, which come in production during a particular base period.

(f) Any other area which Working Group may consider necessary and relevant for the purpose of compilation of IIP

The members deliberated on the terms of reference of the group and found them comprehensive for the purpose. Dr. S. L. Shetty suggested that points mentioned in the Statistical Audit Report on IIP by Dr. N. S. Sastry may also be included in the TOR. The Chairman said that statistical audit points would in any case be discussed in the course of deliberation of the aforesaid ToR. As such, addition of separate point was not necessary.

There was long discussion on the merits and demerits of the current IIP series. Shri Ashish Kumar, ADG (ESD) stressed upon the need for thorough and detailed validation checks of production data by the source agencies before sending to CSO. He also advised the concerned source agencies to carefully examine production data of

capital goods to see whether it is final production or work-in-progress. ADG (ESD) also expressed the view that the dissemination format of IIP should be critically examined keeping in view users' requirement. The following issues were also been suggested by him for deliberation:

- Weighting diagram to be changed once in five years along with the base revision, but constant updation based on annual ASI data to factor in the changing trends.
- Identification of set of products to manufacturing sector having higher contribution towards the overall manufacturing sector.
- Whether unorganized sector to be included while preparing the weighting diagram or there should be a separate IIP for unorganized sector.
- Compilation of 2 separate indices for the organized and unorganized sectors.
- Whether it is possible to Include additional sectors like water supply, sewerage etc. in IIP as per international recommendation.
- Need for data flow by web-enabled system.
- Role of source agencies to validate the data.

Dr. S. L. Shetty advised to explore the possibility of applying Collection of Statistics Act, 2008 for collecting production data from the factories by a single central agency. He also recommended for e-collection of data. Further, Dr. Shetty viewed that the index based on all ASI units with at least 50 workers could be a useful index. Dr. R. Nagaraj mentioned that the system of registration of factories with Chief Inspector of Factories (CIF) is not functioning properly in many States resulting in deterioration of quality of ASI data. Shri B. K. Giri, DDG (ISW) and Shri G. C. Manna, DDG (ESD) supported Dr. Nagraj with the information that a sizeable number of factories (with 10 or more workers) are not registered with CIF as per findings of 62nd Round NSS. The Chairman suggested that a study may be made to find out the percentage share of these left out factories to the total GVA and output.

During discussion on choice between complete enumeration and sampling for compilation of IIP, Dr. B. N. Goldar and Shri M. C. Singhi, Adviser, DEA preferred sampling to complete enumeration. Dr. Goldar advocated for a better sampling design to present a more representative picture at the level of the overall index.The Chairman also agreed to this suggestion. Shri Singhi also pointed out that current basket is not true representative for the use-based categories as selection of items has been done based on NIC classifications. He advised that this point may be kept in mind while selecting basket for the new series. Shri Singhi suggested that DIPP should be allowed to bring out a separate index as was being done for electricity and mining. DIPP index later can be taken into account for consolidating and bringing out overall IIP. It was clarified to him that DIPP does not represent homogeneous group of activities. The information on production of important activities like fertilizer, chemicals and petrochemicals, steel was being reported separately by the concerned ministries. Therefore, it would not be appropriate to compute such index.

Ms. Sonal Varma suggested for collection of capacity utilization data along with production data from the factories and using this information for further cross-validation check. She also suggested for seasonal adjustment of IIP and dissemination of IIP at item levels. Dr. Kanhaiah Singh, NCAER advocated for proper sampling procedure to select factories for collection of production data for the items in the item basket. All the other members also participated in the discussion and made valuable suggestions.

The members of the Working Group were unanimous in their view that revising an index series is a herculean task involving a great deal of works including selection of item basket, derivation of weighting diagram, selection of source agencies and units, collection of backlog data, validation test, trial run etc. In order to successfully complete the task, some subgroups are required to be formed for detailed deliberation and making suggestions / recommendations on different issues. After discussion with all the members, the following five sub-groups were formed:

<table>
<tr><th colspan="2">SUBGROUP NO. 1</th></tr>
<tr><th colspan="2">Subject: Extent of feasibility of implementation of International Recommendations for the Index of Industrial Production (IRIIP, 2010) by UNSD.</th></tr>
<tr><th>Composition:</th><th>Issues to discuss</th></tr>
<tr><td rowspan="2">1. Dr. R. Nagaraj, IGIDR, Mumbai – Chairman
2. Shri G. C. Manna, DDG(ESD) - Convener
3. Dr. Kanhaiah Singh, NCAER, New Delhi
4. Dr. A. K. Srimany, Adviser, RBI, Mumbai
5. Shri K. Thomas, DDG, IBM, Nagpur</td><td>Examining the international recommendations for IIP made by UNSD and exploring the feasibility of implementation in All India IIP.</td></tr>
<tr><td>6. Dr. D. R. Babu Reddy, Agronomist, Coffee Board, Bangalore
7. Shri Sukhvir Singh, Director, M/o P&NG, New Delhi
8. Shri Soumya Chakravorty, Director, DPD, NSSO, Kolkata</td><td>Suggest methodology and modifications in existing system for adopting international recommendations particularly regarding scope, deseasonalization, chain base index etc</td></tr>
</table>

SUBGROUP NO. 2	
Subject: Methodological issues for selection of item basket, derivation of weighting diagram and selection of elementary manufacturing units for collection of data.	
Composition:	**Issues to discuss**
1. Shri S. K. Das, DG, CSO - Chairman 2. Shri A. K. Sadhu,DDG – Convener 3. Shri M. C. Singhi, Sr. Economic Adviser, DEA, New Delhi 4. Shri NareshTakkar, ICRA, New Delhi 5. Dr. Kanhaiah Singh, NCAER, New Delhi 6. Shri Himanshu Joshi, Director, RBI, Mumbai 7. Shri RajanSehgal, Chief Director, Dte of Sugar, New Delhi 8. Shri S. M. Nasrullah, Special Officer (NWI), Tea Board, New Delhi 9. Shri Soumya Chakraborty, Director, DPD, NSSO, Kolkata	Scope of IIP Selection of a representative item basket Derivation of weighting diagram for the selected items Selection of elementary source units (factory / mill etc) for collection of production data. To suggest procedures for substitution of factories in case of closure or change in production line and also to suggest measures to suitably take into account new large sized factories, which come in production during a particular base period.

SUBGROUP NO. 3	
Subject: Methodological issues for scrutiny, validation, compilation and dissemination of data.	
Composition:	**Issues to discuss**
1. Dr. Manjula Krishnan, Principal Adviser, OEA, DIPP – Chairperson 2. Ms. VishuMaini, DDG, DIPP – Convener 3. Shri P. C. Mohanan, DDG, Computer Centre, MOSPI, N. Delhi 4. Shri G. K. Basak, Executive Secy, JPC, Kolkata 5. Ms. Sonal Varma, Economist, Mumbai 6. Dr. C. S. Rao, Chief Economist, ASSOCHAM, New Delhi 7. Dr. A. K. Srimany, Adviser, RBI, Mumbai 8. Shri R. B. Nair, Asstt. Director, O/o Textile Commissioner, Mumbai 9. Shri M. A. Khan, Asstt. Dir., Dte of Vanaspati, Veg. Oils & Fats	Examining existing system of scrutiny and validation of data and suggest modifications. Missing data and data adjustment. Deciding appropriate deflator to be used and level at which to apply deflator. Seasonal adjustment of IIP. Dissemination and presentation of IIP data.

SUBGROUP NO. 4	
Subject: Reviewing existing data collection system and exploring possibility of developing a single dedicated data collection mechanism.	
Composition:	**Issues to discuss**
1. Dr. S. L. Shetty EPWRF – Chairman 2. Shri A. K. Sadhu, DDG, CSO(ESD) – Convener 3. Shri T. K. Dutta, DDG, NSSO(FOD), New Delhi 4. Dr. RomeshKolli, Retd. ADG, CSO, New Delhi 5. Shri NareshTakkar, ICRA, New Delhi 6. Shri G. K. Basak, Executive Secy, JPC, Kolkata 7. Shri Himanshu Joshi, Director, RBI, Mumbai 8. Shri A. K. Biswas, DDG, CCO, Kolkata 9. Shri Bivas Chaudhuri, Director, CSO(ISW), Kolkata 10. Shri M. A. Ansari, Dy. Salt Commissioner, Jaipur	Examining existing data collection system. Exploring possibility of developing a single dedicated data collection mechanism. Identifying agencies for collection of production data for the purpose of compilation of IIP. Studying data collection system in other countries. Integration of data collection for WPI and IIP.

SUBGROUP NO. 5	
Subject: Study of divergence between IIP and Other Sources (like ASI, Excise etc.) as well as volatility of IIP data and suggesting remedial measure in the revised series.	
Composition:	**Issues to discuss**
1. Dr. B. N. Goldar, Professor, IEG - Chairman 2. Shri G. C. Manna, DDG(ESD), New Delhi – Convener 3. Shri B. K. Giri, DDG, CSO(ISW), Kolkata 4. Ms. Sonal Varma, Economist, Mumbai 5. Shri M C Singhi, Sr. Economic Adviser, DEA, New Delhi 6. Dr. A. K. Srimany, Adviser, RBI , Mumbai 7. Dr. C. S. Rao, Chief Economist, ASSOCHAM, New Delhi 8. Shri M. P. Johnson, DDG, D/o Fertilizers, New Delhi 9. Ms. Pranjul Bhandari, O/o Dy. Chairman, Planning Commission	Studying growth rates data based on ASI vis-à-vis IIP Reconciliation of IIP data with other data sources. Finding reasons for divergence Suggesting measures for improvement

It was decided that the next meeting would be held in the middle of August 2012 and progress of works by the subgroups would be reviewed in that meeting besides other agenda items.

The meeting ended with vote of thanks to the Chair.

ANNEXURE XII

Minutes of the Second Meeting of the Working Group for Development of Methodology for compilation of All India Index of Industrial Production (IIP)

The 2nd meeting of the Working Group for Development of Methodology for compilation of All India Index of Industrial Production (IIP) was held on 23rd August 2012 under the Chairmanship of Dr. Saumitra Chaudhuri, Member, Planning Commission.

The meeting started with welcome to the Chairman and all the members. Shri Ashish Kumar, ADG, ESD, opened the discussion by apprising the members that first meetings of all the five subgroups formed in the 1st meeting have been held and the minutes of those meetings have already been circulated to all concerned. He laid down the main agenda for the meeting - reviewing the suggestions / comments offered in by the 5 Sub-groups.

Shri A. K. Sadhu, DDG, CSO (ESD) & Member Secretary, then, gave a power point presentation detailing the Terms of Reference of the Working Group and the agenda outlined for the meeting:

Agenda 1: Considering the Report of the Standing Committee on Industrial Statistics regarding selection of base year (2009-10) of the index and also to examine possibility of using chain base index.

Agenda 2: Considering proposal of the NSC: "The possibility of providing monthly weights for seasonal items (for example, sugar) in the IIP may be explored. This issue may be flagged before the Working Group on IIP."

Agenda 3: Review of progress of works of the 5 subgroups and taking decisions on their suggestions and recommendations.

Agenda 4: Discussion on tentative commodity basket prepared based on ASI data.

Agenda 5: Any other item with permission of the Chair.

Detailed discussion was held by all the members as per agenda and the following points emerged out:

<u>Agenda 1</u>: Considering the Report of the Standing Committee on Industrial Statistics regarding selection of base year (2009-10) of the index and also to examine possibility of using chain base index.

As per decision taken in the 20th meeting of the Standing Committee on Industrial Statistics (SCIS), a Working Group was constituted under the Chairmanship of Dr. R. Nagaraj with the following terms of reference:

a) To suggest preparatory work for switching over to an appropriate new base year and related methodological aspects for constructing the all-India IIP with the new base; and

b) To explore the feasibility of constructing chain base all-India IIP with a view to capture the growth in industrial output in a more realistic manner and suggest necessary steps for construction of index.

The Working Group has submitted its report and some of the important recommendations made are given below:

1. Keeping in view the current status of data availability and manpower shortage, it won't be feasible to adopt chain base index for IIP.

2. The year 2009-10 is recommended as the new base year of IIP for consideration of the Standing Committee on Industrial Statistics (SCIS).

3. Based on data of ASI 2009-10, a study would be undertaken to assess the significance of the sector "Gas, Water Supply, sewerage and remediation", for possible inclusion within the ambit of IIP.

4. As another Working Group under Dr. Saumitra Chaudhuri, Member, Planning Commission has been set up having methodological aspects for construction of IIP as common in terms of reference (TOR), discussion on methodological issues for construction of IIP is left to that Working Group to avoid duplication.

As there was no meeting of SCIS in the meantime, the report was circulated amongst all the members of SCIS. No adverse comment was received from any of the members of SCIS. The members deliberated upon the aforesaid recommendations and

made detailed discussion on issue of switching over to chain base index. It was observed that the gap between indices calculated using fixed-base and chain-base methods starts widening after 4-5 years, and switching to a new base year after every 5 years, which is also as per the UNSD International Recommendations for IIP, 2010, would suitably take care of this divergence. The WG, however, suggested that feasibility of adopting chain base index may be examined again by the Subgroup-1 before taking the final decision.

<u>Agenda 2</u>: Considering proposal of the NSC on "The possibility of providing monthly weights for seasonal items (for example, sugar) in the IIP."

In the 52nd meeting of the National Statistical Commission (NSC), it has been recommended that the possibility of providing monthly weights for seasonal items (for example, sugar) in the IIP may be explored and the issue may be flagged before the Working Group on IIP.

The members discussed on this issue and agreed that, although assigning different monthly weights to seasonal items would definitely be an improvement, it would be very difficult to derive monthly weights due to non-availability of monthly item wise production data of the country as ASI provides only annual data. A change in weights of seasonal items would amount to changing the same for the rest of the items as well. It is recommended that an exercise for only 'food products' group may be attempted without altering the weights at the NIC 2-digit level and Subgroup-2 would examine the feasibility of such monthly weighting diagram.

<u>Agenda 3</u>: Review of progress of works of the 5 subgroups and taking decisions on their suggestions and recommendations.

Detailed and prolonged discussion on the suggestions / comments made in the meetings of the five subgroups was held and following recommendations were made point wise:

BASE YEAR

The members re-confirmed the decision taken in the first meeting to shift the base year of IIP from 2004-09 to 2009-10.

STATISTICAL UNITS AND CLASSIFICATION

The WG recommended that the elementary statistical units for collection of data would be establishments (factory, mill etc.). For classification of industries, NIC-2008 would be used in the new series.

Regarding product codes, the members observed that for this base year revision of IIP, ASI data are available based on ASICC codes as the ASICC was used till 2009-10. NPCMS is being used in ASI from 2010-11 onwards. However, keeping in view future mapping, Dr. Bivas Chaudhuri, Director, CSO (ISW) assured to do the mapping between NPCMS and ASICC in ASI09-10 data and provide necessary database to CSO (ESD) for IIP revision. One small group was formed for this purpose comprising the following officers:

1. Shri M. C. Singhi, Senior Economic Adviser, DEA, M/o Finance

2. Dr. A. K. Srimany, Adviser, RBI, Mumbai

3. Shri A. K. Sadhu, DDG, CSO(ESD), New Delhi

4. Dr. Bivas Chaudhuri, Director, CSO(ISW)

This group would examine the feasibility of getting product wise [as per NPCMS code] value of output data and concordance between NPCMS with 5-digit NIC-2008 based on ASI2009-10. If problem arises, ASICC codes will be used for the whole exercise of IIP revision this time.

FRAME FOR IIP

Although, properly maintained business register (BR) should be frame for sample selection for IIP as per UNSD guidelines, ASI frame would be used as sampling frame for selection of basket and deriving weighting diagram for the current revision of IIP since BR is yet to be created in India. But, for future revisions of IIP, an expanded frame combining ASI frame, Economic Census data and lists maintained by other source agencies is recommended for use.

SCOPE & FREQUENCY

Although UNSD guidelines state that IIP is to be compiled for activities in ISIC Rev. 4 Sections B, C, D and E, i.e. (i) Mining and quarrying, (ii) Manufacturing, (iii) Electricity, Gas, Steam and Air-conditioning supply and (iv) Water supply, Sewerage, Waste management and Remediation activities, due to constraints of the data availability and other resources, WG decided that status quo should be maintained with (i) Mining, (ii) Manufacturing and (iii) Electricity as scope of All India IIP. Frequency of IIP would also continue as monthly.

SELECTION OF FACTORIES / UNITS

Detailed and protracted discussion was held by the members on this issue and it was agreed that there would be no improvement in the quality of IIP if we continue using only the frame available from ASI. Although, due to constraint of non-availability of business register it has been decide to select item basket and derive weighting diagram based on ASI data, the members supported the augmentation and enrichment of the frame for selecting units for collection of production data. It has been suggested that CSO would explore the possibility to prepare a frame by combining the frames available from ASI, DIPP and Ministry of Corporate Affairs. WG also recommended that there should be at least 5 source units for each item.

ESTIMATION FOR MISSING DATA

Imputation of production data for non-response is done at Source Agency level. CSO has suggested the following three methods for estimating the production of non-responding units:

- Using previous month's production figure of the particular unit
- Using previous year same month's production figure of the particular unit
- Using average of the last 3 months' production figures of the particular unit.

Some of the source agencies use their own methodologies to estimate the production of non-responding units. WG has accepted the suggestion made by Subgroup-3 for estimation by applying month-to-month growth, observed during the previous year, on last month's production figure. A standard methodology would be developed at ESD, CSO for the estimation of production of non-responding units to be followed by all.

SUBSTITUTION AND NEW UNITS

The members made detailed discussion on this issue and agreed that as IIP is based on panel data, it won't be possible to include the new units. Members emphasized on regular revision of IIP series at every 5 years as per UNSD recommendation in order to properly address this issue. For substitution of factories for closure or change of production line, a reserve list containing units having more or less same production pattern would be prepared at the time of revision.

COMPUTATION METHOD AND DEFLATORS

After detailed discussion on this issue, WG made the following recommendations:

- Laspeyre's index formula would be used to construct the All India IIP.
- As long as PPI is not available, WPI would be used as deflator.
- The item baskets of WPI and IIP may be synchronised so as to have the best possible mapping resulting in availability of appropriate deflator for each item group.

SCRUTINY AND VALIDATION CHECKS

The members examined the existing system of scrutiny and validation checks followed by CSO as well as the source agencies. After detailed deliberation, the following recommendations are made:

- CSO would prepare a standard validation manual to be uniformly followed by all the data suppliers.
- CSO would call meeting of data supplying agencies at regular intervals to impress upon them about the requirement of proper data as also to discuss with them about the deficiencies in the data.

DATA COLLECTION MECHANISM

After reviewing the suggestions made by Subgroup-4 regarding data collection mechanism for compilation IIP, WG made the following recommendations:

- CSO(ISW) would be entrusted with overall responsibility of the collection and compilation of data for IIP with the help of NSSO (FOD) and some other source agencies having unmatched expertise in their own fields for a group of specific items (like sugar, minerals, electricity, salt etc.)
- Collection of Statistics Act, 2008 would be applied for collection of production data for compilation of IIP.

- A web-portal system would be developed for online submission of data by the elementary units [factory, mill, pits etc.].
- Strengthening the data collection mechanism would be done through recruitment of adequate and well-trained statistical personnel.
- Training programme would be organised at regular intervals for the field personnel engaged for collection of production data.
- A Legal Section would be set up in the Ministry of Statistics & P.I. in order to facilitate proper implementation of the Collection of Statistics Act, 2008 for collection of IIP data.
- Adequate publicity / awareness programme would be undertaken for improvement of response rates.

SEASONAL ADJUSTMENT OF IIP

At present, seasonal and trading day adjustment is not done for All India IIP. The members made in-depth discussion on this point and agreed that it would be difficult to get 'trading day' information every month and as such trading day adjustment is not feasible. Regarding seasonal adjustment, the WG recommended to release suitably de-seasonalized indices using X-12 ARIMA method once or twice in a year. At the same time, care should be taken to avoid undertaking frequent revisions in the already-released indices.

DISSEMINATION OF DATA

Regarding dissemination of data, UNSD guidelines and Indian conditions were thoroughly discussed by the members and the following recommendations were made:

- All India Index of Industrial Production would be disseminated up to the 4-digit level of NIC.
- Index numbers would be presented to one decimal place.
- Quarterly IIP and growth rates would be mentioned along with the monthly press release at the end of each quarter.
- Time series data would be placed in website for users.
- Confidentiality of individual survey respondents would be maintained.

- Data would be made available to all users at the same time.

RECONCILIATION OF IIP WITH OTHER SOURCES

The views / suggestions made by the Subgroup-5 on this issue were critically examined by the members and following recommendations were made:

- A Research & Development wing would be set up within the IIP unit to undertake comparison between results from IIP and other data sources on a regular basis.
- In order to take into account the quality aspects, 'preferred' method prescribed in IRIIP 2010 would be followed for as many items in the basket as possible.

<u>Agenda 4</u>: Discussion on tentative commodity basket prepared based on ASI data.

CSO(ESD) made an exercise based on ASI2009-10 data to see the difference in the number of items get selected in the commodity basket by following:

Method 1: selection of all the items contributing 0.2% or more to the total value of output in each 2-digit level of NIC

Method 2: arranging the items in descending order of value of output within each 2-digit level of NIC and then selecting the items from the top until and unless total value of output of the selected items become at least 80% of the total value of output at 2-digit level.

It was observed that number of items in method 1 becomes almost double of that in **Method 2**. After detailed deliberation, the WG preferred method 2 and recommended that a tentative item basket would be selected following method 2 and put before Sub-Group-2 for further discussion. IBM would also prepare a revised basket on minerals based on 2009-10 data and put before Sub-Group-2.

<u>Agenda 5</u>: Any other item with permission of the Chair.

WORKSHOP WITH SOURCE AGENCY

The members observed that in the current series [Base Year: 2004-05] of IIP, the methods of data collection being followed by different source agencies are lacking a standard methodology and statistically trained personnel required for the job. Seeing the importance of the data collection, the WG suggested that CSO should organise workshop with all the source agencies in groups at New Delhi, Mumbai and Kolkata - before the next meeting of the Working Group. In these workshops, the source agencies would be required to present status paper detailing the method of data collection and the estimation of production for non-responding units.

It was decided that the next meeting would be held in November 2012 and progress of works would be reviewed in that meeting besides other agenda items.

The meeting ended with vote of thanks to the Chair.

ANNEXURE XIII

Minutes of the Third Meeting of the Working Group for Development of Methodology for compilation of All India Index of Industrial Production (IIP)

The 3rd meeting of the Working Group for Development of Methodology for compilation of All India Index of Industrial Production (IIP) was held on 28th December 2012 under the Chairmanship of Dr. Saumitra Chaudhuri, Member, Planning Commission.

The meeting started with welcome to the Chairman and all the members. Shri V. K. Arora, ADG, ESD, opened the discussion by apprising the members briefly about the agenda points laid down for discussion in the meeting.

Agenda 1: Presentation of the chosen tentative item basket for 2009-10 based on ASI data elaborating the steps followed for its construction along with its weighting diagram and detailed discussion and suggestions on the basket so chosen

Agenda 2: Discussion on feasibility of assigning monthly weights to seasonal items

Agenda 3: Compilation of chain-based indices of IIP

Agenda 4: Dissemination of de-seasonalized indices

Agenda 5: Discussion on some of the important recommendations of the Report of the Independent Inquiry on Data Errors in IIP and Exports conducted by Dr. R. B. Barman, Retd. Executive Director, RBI

Agenda 6: Any other item with permission of the Chair.

Shri A. K. Sadhu, DDG, CSO (ESD) & Member Secretary, then, gave a power point presentation touching upon each of the points outlined for discussion in the meeting. Summary records of detailed discussion, held by all the members on all the agenda points, are as follows:

<u>Agenda 1</u>: Presentation of the tentative item basket for 2009-10 selected based on ASI data.

As per the decision taken in the 2nd meeting of the Working Group held on 23rd August 2012, a tentative item basket along with its weighting diagram were placed before the WG after due elaboration and deliberation on the methodology followed for choosing the same keeping in view the recommendations made by the Subgroup II in its 2nd and 3rd meetings held on 7thNovember and 10th December 2012 respectively. Shri Sadhu detailed the methodology followed for selecting the item basket using ASI 2009-10 data. The steps followed are as below:

1. Since an item with the same description may occur in different industry groups (NIC 3-digit level), the dataset was de-duplicated according to the item descriptions following the basic 2 principles:

- The **maximum value** of each item (and not the total value of each item aggregated over all industry groups in which it occurs) was considered- assuming that the industry group in which the maximum value of an item occurs is the appropriate classification of that item.

- The product is assigned the **industry group in which its maximum value occurs.**

2. The items are then arranged by ASICC inside 3 digit industry groups and all those **items classified in ASICC as n.e.c.** (not elsewhere classified) were **removed** from data by redistributing their GVO over the ASICC description with the same first four digits within the same industry group.

3. Item basket is then selected. Keeping in view the basic premise of "arranging the items in descending order of value of output within each 2-digit level of NIC and then selecting the items from the top until and unless total value of output of the selected items become at least 80% of the total value of output at 2-digit level" as per the decision of the WG in its second meeting, it was decided **to improve upon the representativeness and robustness** of the basket so chosen at lower levels of NIC by following the same methodology at NIC 3-digit level instead of the NIC 2-digit level. That is, all the **items were arranged in descending order of value at 3-digit NIC level** and all those selected with a **cumulative contribution of at least 80% of the total GVO at the NIC 3-digit level**.

The provisional weighting diagram for the item basket so chosen was also developed using the following data sources:

a) NAS 2009-10 GDP share for sectoral weighting

b) ASI GVA at NIC 2 digit level (for organized sector)+ NSS 67th round (Survey on Unincorporated Non-agricultural Enterprises (Excluding Construction) 2010-11) GVA at NIC 2 digit level, deflated by yearly WPI (for unorganized sector)

c) ASI GVA at NIC 3 and 4 digit levels

d) ASI GVO at item level to arrive at NIC 5 digit level weighting

Using the aforementioned methodology, a snapshot of the provisional item basket for 2009-10 was arrived at:

Parameters	**Number**	**Weight (in IB 2004-05) [Out of total wt. for Mfg. sector - 75.52%]**
Total no of items	719	-
Number of common items from previous basket	384	53.04%
Number of new items	335	-
Number of items not featuring in current Item Basket (out of 619)	235	12.48%

Sectors	**No. of items: 2004-05**	**Weights: 2004-05**	**No. of items: 2009-10**	**Weights: 2009-10**
Mining	61	14.157	55	11.425
Manufacturing	620	75.527	719	78.899
Electricity	1	10.316	1	9.676
General	682	100	775	100

The Chairman suggested finding out the contribution of products with n.e.c.'s in their ASICC description at the NIC 3-digit level to check whether it was significant in a particular industry group. It was also explained that the problem with such ambiguous descriptions would result in difficulty while selecting factories for collection of data, and it could not be avoided since this was a problem inherent in the ASICC product classification codes. The Chairman then suggested using NPCMS codes instead of ASICC (as being used currently) in order to overcome this problem as also to maintain comparability over the years with ASI data, since ASI has already switched to using NPCMS instead of ASICC (used till 2009-10) from 2010-11. In order to accomplish this exercise, a concordance between ASICC and NPCMS for 2009-10

was called for in order to select the item basket using NPCMS. It was also decided to request CSO (IS Wing) to make a presentation on the classification structure of the NPCMS in the next meeting of the WG.

It was also suggested to finalize the item basket in consultation with various source agencies along with certain Associations to be shortlisted to tackle the problem of exclusion of certain important items that fail to get captured in the ASI 2009-10 data.

An exercise to find out a list of common and important items between ASI 2008-09, 2009-10 and 2010-11 data could also be carried out at ESD in order to eliminate the risk of inclusion of highly volatile items. This could be attempted by averaging the GVOs for items from all the 3 years and then selecting the item basket.

The item basket selected by Indian Bureau of Mines (IBM), Nagpur, consisting of 55 items (4 fuel minerals, 9 metallic minerals, 42 non-metallic minerals) was also circulated amongst the members of the WG.

Agenda 2: Discussion on feasibility of assigning monthly weights to seasonal items.

The WG was apprised with the recommendations of SG II made in its 2nd meeting on the aforementioned agenda point whereby it was suggested to drop the idea of assigning monthly weights to seasonal items due to the following reasons:

- Non-availability of monthly data in order to give appropriate weights to items depicting seasonality
- Seasonal items appearing not only under 'food products' but other industry groups as well, making it difficult to assign seasonal weights
- Redistributing weights for seasonal items may affect different Use Based Categories, since such items may not occur only in 1 Use Based Category

It was suggested to pick only 4-5 agricultural commodities for which monthly production data are easily available and assign them monthly weights accordingly.

Agenda 3:Compilation of chain-based indices of IIP.

The WG was apprised of the recommendation of SG I made in its 2nd meeting on 27th September 2012 where it was recommended to go for timely revision of base at every 5 years rather than going for a chain base index since:

- A break in series would be encountered every time there is a change of NIC series, which was established after finding out that compilation of chain indices for 2008 and beyond by adjusting weights at 2-digit level of NIC could not be done due to absence of proper concordance between NIC-04 and NIC-08.

- It was also observed that the gap between indices calculated using fixed-base and chain-base methods starts widening after 4-5 years, and switching to a new base year after every 5 years, which is also as per the UNSD International Recommendations for IIP, 2010, would suitably take care of this divergence.

  A suggestion was made to undertake another exercise to establish the feasibility of compilation of Chain based indices in order to improve upon the current practice of compilation of IIP using Fixed base method.

Agenda 4: Dissemination of deseasonalized indices.

SG I, in its 2nd meeting, discussed and recommended the use of X-12 ARIMA for the purpose of disseminating deseasonalized indices with the decision to restrict the number of revisions to 2 in an year. The members of the WG were also apprised of the constitution of a Committee by CSO (NAD) under the Chairmanship of Dr. Nachane to develop suitable methodology for de-seasonalisation of all macro indicators including IIP, WPI and GDP, etc. It was recommended to, perhaps, wait for the decision of this committee.

It was also suggested to study the practice being followed in the US currently to deseasonalize their indices.

Agenda 5: Discussion on some of the important recommendations of the Report of the Independent Inquiry on Data Errors in IIP and Exports conducted by Dr. R. B. Barman.

The members of the WG were apprised of some of the important recommendations made by Dr. R. B. Barman, Retd. Executive Director, RBI, after the conduction and submission of the Report of the Independent Inquiry on Data Errors in IIP and Exports.

Recommendation	Action Taken/ Comments
ESD, CSO maintains data in Excel Sheets. This falls short of modern relational database management system (RDBMS) with possibilities of introducing strong inbuilt mechanism for introducing audit trails on data integrity.	NIC is being consulted to improve the system.
The data collection for IIP should be centralized under the control of CSO	WG has made following recommendations in its 2nd meeting: • CSO(ISW) would be entrusted with overall responsibility of IIP data collection with the help of NSSO (FOD) and some other source agencies having unmatched expertise in their own fields for a group of specific items (like sugar, minerals, electricity, salt etc.) • Collection of Statistics Act, 2008 would be applied. • Recruitment of adequate and well-trained statistical personnel. • Training programme at regular intervals for the field personnel. • Setting up a Legal Section in MOSPI • Adequate publicity / awareness programme
• Web based system for collection of data can be designed to provide useful validation checks at the time of submission of data by respondents so that gross errors are eliminated at the first stage itself. • There should be automated reminder generation through e-mail or SMS. • Call centers can be set up to deal with default as a cost effective and efficient mechanism.	• WG has recommended in its 2nd meeting that a web-portal system would be developed for online submission of data by the elementary units [factory, mill, pits etc.]. • NIC would be consulted for this

It was found that the WG had, more or less, given its recommendations on these issues on the same lines already in its 2nd meeting.

Agenda 6: Some other important points for discussion

Certain other important issues were listed down for discussion:

- ESD has received a request from DIPP to drop items/ merge with others in the present series- Gutka, Polythene bags, Dairy Machinery, Calculators, Colour TV Picture Tubes, EPABX/ PABX Systems, Syringes, Water Meter, Clock/ Watch/ Timepiece Movement- due to insufficient coverage or banning of certain items in some states.

  It was found that certain items such as- Polythene bags, Colour TV picture tubes, Syringes and Clock/ watch/ timepiece movement- were occurring in the newly drawn item basket for 2009-10 as well, which indicated that these items have still not lost their relevance. This issue was flagged in front of the members of the WG. It was decided that the concerns of DIPP would be kept in mind while the selection and finalization of the item basket in the new series. However, it was not possible to drop these items from the current series so as not to lose the continuity of the series.

- The WG, in its 2nd meeting, had decided to disseminate indices at NIC 4 digit level in the new series. The SG I suggested reconsidering the decision since item basket had been selected at NIC 3 digit level and the new series may be disseminated no lower than NIC 3 digit level taking into account the robustness of the indices at disaggregated levels.

  The WG appreciated concerns put forward by the SG I and suggested dissemination of indices at NIC 3 digit level as also at the product level to ensure maximum transparency.

- Since the Office of the Jute Commissioner was facing the problem of insufficient data coverage, it was suggested to switch to National Jute Board for collection of production data in the new series, which was accepted by the WG.

- Considering the fact that in the current series, the agricultural production of coffee was covered instead of production of processed coffee, it was suggested by the WG to drop Coffee Board as a data source during the revision of the base year of IIP and collect production data for coffee from relevant factories directly.

- Since, currently, over 10,000 units are covered on a monthly basis for collection of production data for Salt by the O/o Salt Commissioner, the WG recommended covering only 600-700 major salt-producing pits so as to maintain good quality data along with assuring maximum response every month.

  It was decided that the next meeting would be held in March 2013 and a report of the WG would be placed in the same.

The meeting ended with vote of thanks to the Chair.

ANNEXURE XIV

Minutes of the Fourth Meeting of the Working Group for Development of Methodology for compilation of All India Index of Industrial Production (IIP)

The 4th meeting of the Working Group for Development of Methodology for compilation of All India Index of Industrial Production (IIP) was held on 20th December 2013 under the Chairmanship of Dr. Saumitra Chaudhuri, Member, Planning Commission. List of the members / officials present in the meeting is given at Annex-I.

The meeting started with Shri G. C. Manna, ADG, ESD welcoming the Chairman and all the members. Shri S. Chakrabarti, DDG, ESD and Convenor of the Working Group gave a power point presentation touching upon each of the points outlined for discussion in the meeting. A draft report of the Working Group was also placed before the members for discussion on the recommendations of the sub-groups under the Working Group before finalization.

The members of the Working Group were apprised by Sh. Ashish Kumar, ADG, NAD, that the National Accounts Division (NAD) has, on the basis of NSS 68th round data, already finalized on 2011-12 as the new base year for national accounts statistics. Since it is advisable to consider the same base year for all macroeconomic aggregates, it was discussed and recommended by the Working Group to conduct base revision related exercises taking 2009-10 as the base and then lay down a smooth path for transition of the base year to 2011-12.

The Working Group discussed on the issue of switching over to a volume index and recommended that in the new base year, the Index of Industrial Production may continue to be a hybrid index using a mix of quantity and value of production for different items, in line with the international recommendations. The details regarding items for which data on value of production will be used will be worked out under the guidance of the Working Group once the item basket is finalised.

The Working Group was of the view that de-seasonalised indices may be disseminated only once in a year or once in two years instead of the bi-annual frequency suggested by Sub-Group I.

The Working Group accepted the methodology for drawing the item basket as recommended by Sub-Group II. It also recommended that the methodology proposed for drawing a weighting diagram for the new base year may be accepted in line with the international recommendations laid down in the IRIIP, 2010.

On the issue of convergence between the item baskets for IIP and WPI, Ms. Aditi S. Ray, Sr. Adviser, O/o Economic Adviser, pointed out that one-to-one convergence between both the item baskets may not be possible, however an identical mapping may be worked out through mutual consultation between CSO and O/o Economic Adviser. Also, since both the baskets may contain more-or-less similar items, Dr. B. Goldar, Professor, IEG and Member, NSC, suggested that the possibility of a single-source data collection from the same set of factories for items occurring in both the baskets may be explored for collection of monthly data.

The exercise undertaken by CSO to bring on-board factories from the frame of Ministry of Corporate Affairs (MoCA) into the frame for selection of factories for collection of monthly production data was appreciated by the members. The expanded frame based on ASI, list of factories maintained by current source agencies and the above factory list form MoCA may be used for factory selection in the new base year.

The Working Group recognized the importance of considering new units in the panel of factories as and when they appear and also to devise a methodology for substitution of closed/ non-responding units. Since such a methodology is currently unavailable, the Chairman suggested that comments/ suggestions in this regard may be solicited from the members of the Working Group to be incorporated in the final report of the Working Group.

The Working Group opined that the method of estimation of non-response and validation of data as suggested by Sub-Group III may be adopted for the new base year. Data from additional sources e.g. Excise data (assessable value) of commodities from the Central Board of Excise and Customs may be used for internal validation by CSO.

While designing the proposed web-portal for collection of data, the dummy interface/GUI may be shared with the members of the Working Group for suggestions to make it as user friendly as possible.

The item basket selected for the new base year and the revised draft report of the Working Group will be circulated for suggestions/comments of the Chairman and members of the Working Group which may be taken on-board for finalising the report and the item basket.

The fifth and final meeting of the Working Group is proposed to be held at the end of January, 2014 for adoption of report of the Working Group.

The meeting ended with a vote of thanks to the Chair.

ANNEXURE XV

Fifth Meeting of the Working Group for Development of Methodology for compilation of All India Index of Industrial Production (IIP)

The 5th meeting of the Working Group for Development of Methodology for compilation of All India Index of Industrial Production (IIP) was held on 14th February 2014 under the Chairmanship of Dr. Saumitra Chaudhuri, Member, Planning Commission. List of the members / officials present in the meeting is given at Annex-I.

The meeting started with Shri G. C. Manna, ADG, ESD welcoming the Chairman and all the members. Shri S. Chakrabarti, DDG, ESD and Convenor of the Working Group gave a power point presentation briefing about each of the agenda points for the meeting. The agenda points focussed mainly on views/comments of the members on specific issues that are to be addressed in the report of the Working Group.

The Chairman recommended that the final report of the Working Group will be adopted in the final meeting of the Working Group, to be held on 18.03.2014. The discussions and recommendations of the Working Group's fifth meeting must be incorporated into the final report of the Working Group and it must be circulated to all members at least one week prior to the final meeting, i.e. by 11.03.2014.

The agenda items were taken up for discussions in succession and the recommendations of the Working Group are detailed below:

Agenda 1: Shifting of base year from 2009-10 to 2011-12

Two methods were proposed by CSO for completing the shift of base year to 2011-12. While the first method would entail adjusting the item basket and weights drawn on the basis of 2009-10 data, to that of 2011-12, the second method amounts to redoing all the exercises afresh. It was observed by members that in view of the timelines for rolling out the new base year and considering the significant progress already made, the second method may not be adopted.

The Chairman was of the view that, since 2011-12 is a desirable base year and we have already made considerable progress in terms of the work required for base

revision, it is advisable to adequately adjust the proposed set of items and their weights taking into account 2011-12 data, as soon as the same becomes available. The Chairman also observed that though there will be slight changes in the list of significant items and also their shares in 2011-12 compared to 2009-10, the changes may be addressed at the secretariat level, keeping in mind the methodology followed for 2009-10.

Agenda 2: Proposed item basket for 2009-10

On Dr A. K. Srimany's proposal of including data for captive power generation in total electricity generated, the Chairman viewed that the data comes at a lag of almost two years and hence cannot be taken into account for monthly compilation of the IIP.

As per suggestion of DDG, D/o Chemicals and Petrochemicals, the Working Group recommended that if the source agencies feel that a significant item, in terms of production, as per their list is missed in the item basket, they may recommend for inclusion of such items. The weights of such items may be adjusted along with other items using production data from source agencies themselves.

On the issue of emerging and new products to be included during the course of a base year, as per suggestion of DIPP, the Working Group decided that a Technical Review Committee may be constituted to review such products and also decide on the methodology for including them in the existing basket.

Agenda 3: Treatment of Capital Goods/Items for which data on value to be collected

For items such as heavy machinery, capital goods, etc, it was recommended that value of 'Operating Work in Progress' should be collected in order to avoid spikes in reporting of these items and reduce volatility. It was also recommended that instructions/ guidelines be issued to the units providing data, for providing 'monthly work in progress' values for capital goods.

It was intimated by DIPP that the WPI item basket will include all the items of the IIP basket for the items whose data will be collected in value terms.

Agenda 4: Methodology for considering new units in the panel of factories

For considering inclusion of new large units in the midst of a base year, the same Technical Review Committee (see agenda 2) may review such cases and also decide on case to case basis, the methodology of including the same in the panel of factories.

Agenda 5: Methodology for substitution of closed/ non-responding units

While it was agreed that a reserve list of factories is necessary for substituting units showing consistent non-response, it must be borne in mind that non-response for three months will be considered a unit fit to be replaced. The substitution must be based on the criterion of closeness in production capacity of the substituting units with that of the unit being substituted.

Agenda 6: Selection of factories

The Chairman agreed with the view of Dr. S. L. Shetty, that additional sources must be tapped to augment the frame of factories for IIP. However, this must be a continuous process. For the current base revision it may suffice to augment the ASI frame with the list of factories available with source agencies and factories identified from MoCA's database, after checking for overlaps with ASI frame. It may also be examined whether any large unit is being missed from the 6th Economic Census Directory, while finalizing the frame.

Agenda 7: Collection of data and related aspects

The Working Group was of the view that efforts for mass awareness about IIP may be made through brochures/ flyers and information on the website of MoSPI. Also Industry Associations may be associated in facilitating publicity and awareness activities, particularly the periodic seminars and discussions on the IIP. CII representative expressed their readiness to support such activities.

NSSO (FOD) may follow-up with the units which should be registered under the Factories Act in the list of Chief Inspector of Factories in the States and provide in writing, list(s) of all such units to be enlisted/registered. The Chairman opined that on the issue of updation of list of factories maintained by the Chief Inspector of

Factories, direct line of communication could be opened between MoSPI and higher levels in the State Governments.

The D/o Chemicals and Petrochemicals informed that they are in a position to provide data for 'dyes' which is currently being provided by DIPP. Hence the item may be shifted for reporting to D/o Chemicals and Petrochemicals.

The Working Group also decided that de-seasonalized indices will not be compiled and published by CSO.

Agenda 8: Estimation of non-response

The Working Group agreed with the earlier recommendation documented in the report.

Agenda 9: Other suggestions/ comments by members

A table showing comparative distribution of weights by 2-digit level of NIC for each of the base years, 1993-94, 2004-05 and 2009-10 may be provided in the report to exhibit relative changes in the weighting pattern.

Agenda 10: Discussion of recommendation of Committee of Secretaries regarding inclusion of the unorganized sector in IIP.

The Working Group decided that the frame of factories for the IIP in the new series will be based on the latest ASI frame supplemented by additional units from the source agencies and those identified from the MoCA database, if possible. The Working Group further recommended that when the M/o MSME will come out with a separate index for the MSME sector, in accordance with the recommendation of the CoS, the CSO will consider how the MSME index could be dovetailed with the new IIP.

Agenda 11: Discussion on factories selected using the ASI frame

Shri Soumya Chakraborty suggested looking at the number of factories per item in the basket from three previous years of ASI in order that a robust set of factories can be selected for the basket.

It is recommended that a mapping of the NIC 2-digit be done with the use-based classifications and put up on the website of MoSPI for public view.

In the new base year it was recommended that the use-based classifications may be re-categorised as the following:

i. Primary Goods (Mining and Electricity)

ii. Intermediate Goods

iii. Capital Goods; and

iv. Consumer Goods (Durables and Non-durables)

The meeting ended with a vote of thanks to the Chair.

ANNEXURE XVI

Sixth Meeting of the Working Group for Development of Methodology for compilation of All India Index of Industrial Production (IIP)

The 6th meeting of the Working Group (WG) for Development of Methodology for Compilation of All India Index of Industrial Production (IIP) was held on 24thMarch 2014 under the Chairmanship of Dr. Saumitra Chaudhuri, Member, Planning Commission. List of the members / officials present in the meeting is given at Annex-I.

The meeting started with Shri G. C. Manna, ADG, ESD welcoming the Chairman and all the members. ADG, ESD also flagged the issue of specific guidelines to be laid down for making a transition from the item basket selected for 2009-10 to 2011-12. On this issue, the Chairman reiterated that there may be incremental changes to the already drafted item basket for 2009-10 for arriving at the item basket for 2011-12. Also, changes in the weighting diagram will be necessary based on 2011-12 data. Such changes may be carried out at CSO following the methodology prescribed for drawing 2009-10 item basket and may be vetted by the Technical Review Committee to be constituted as proposed by the WG in its 5th meeting.

Dr. S. L. Shetty, Adviser, EPWRF, expressed his concern regarding the change in item specification due to the change in product classification from ASICC in 2009-10 to NPCMS in 2011-12. The Chairman informed him that such problems had been anticipated and adequately addressed while finalizing the item basket for 2009-10.

Sh. S. Chakrabarti, DDG, ESD and Member Secretary of the Working Group, presented the list of items shared by Joint Plant Committee and Department of Chemicals and Petrochemicals to be considered for inclusion in the item basket for 2011-12. The Chairman however opined that items having significant GVO shares have already been considered in the item basket. There are a number of items in both the lists which are ambiguous and therefore data collection on such items and other insignificant items of the two lists may lead to high non-response and large fluctuations. Keeping the above in mind while finalizing the item basket for 2011-12, CSO may include only significant items from the sources' list, if missed out in the drafted item basket.

A detailed chapter-wise discussion on the draft report was held and members of the WG suggested changes that should be incorporated in the final version of the report before its circulation. Further following observations made by the members have been accepted for compliance while finalising the report.

1. There should be a discussion in the report on the broad objectives of the Technical Review Committee to be constituted by CSO.
2. There should be appropriate explanation for the reason why PPI should be preferred to WPI for the purpose of deflating Value of Production data reported for the IIP.

3. Reasons for not compiling disaggregated indices for the components of Electricity as a product may be provided.
4. The weighting diagram at NIC-2 digit level may not include unorganized sector weights and should be exclusively based on GVA figures from the organized manufacturing sector. That the IIP stands for the organised manufacturing sector needs to be clarified wherever required and specific statement as already decided in respect of MSME sector may be made with reference to the CoS recommendations of 2010.
5. With reference to the table on comparison of weights, reasons for changes in weights across years may be provided. An additional table for comparison of weights of the NIC-2008 groups across some recent years may be included.
6. In order to clearly understand, the expression 'Value of Production / Operating Work in Progress' of Capital Goods may be defined as 'Value of Net Sales' + 'Closing Stock of Capital Goods (Net Value of Work in progress + Net Value of Finished goods)' – 'Opening Stock of Capital Goods (Net Value of Work in progress + Net Value of Finished goods)' and clarification as to the concepts of 'Net Value' may be included appropriately.
7. For regular comparison of the IIP with the Excise Revenue, 'Assessable Value of Production' rather than Excise Collection from data obtained from the Department of Revenue may be used. In the analysis of the study made in this respect appropriate explanation on these lines may be added in the report.
8. For identifying outliers in the time series production of IIP, CSO may take the advantage of Confidence Limits identification but the limiting values must be reset at regular intervals, preferably once in a year to take into account changes in the production pattern during the period, if any.A note may be appropriately added in the context of diagnostics for the data problems.
9. To explain the characterization of the Use-Based Classification (UBC) in respect of items that are likely to feature in each of the categories under the proposed UBC system, a suitable description may be provided.
10. The Technical Review Committee may annually review items that exhibit extraordinarily high increase/ decline in index during the currency of a fixed base year and may take a view on re-setting the base production so as to normalize the changes in the indices in keeping with the order of shift in the modified reference line.
11. NIC-2008 2 and 3-digit descriptions may be included in the report.
12. A section on institutional capacity creation may be added in the report to specifically highlight the need for strengthening the statistical units of the administrative sources and also the IIP unit of ESD citing the problems being encountered by concerned organisations/ units responsible for compilation of the IIP data and release of the index.
13. Recommendations may be added/ altered to take into account the new points/ decisions stated above.

The meeting ended with a vote of thanks to the Chair.

ANNEXURE XVII

Description of 2-digit NIC groups pertaining to the Manufacturing Sector in NIC 2008

10	Manufacture of food products
11	Manufacture of beverages
12	Manufacture of tobacco products
13	Manufacture of textiles
14	Manufacture of wearing apparel
15	Manufacture of leather and related products
16	Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
17	Manufacture of paper and paper products
18	Printing and reproduction of recorded media
19	Manufacture of coke and refined petroleum products
20	Manufacture of chemicals and chemical products
21	Manufacture of pharmaceuticals, medicinal chemical and botanical products
22	Manufacture of rubber and plastics products
23	Manufacture of other non-metallic mineral products
24	Manufacture of basic metals
25	Manufacture of fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products
27	Manufacture of electrical equipment
28	Manufacture of machinery and equipment n.e.c.
29	Manufacture of motor vehicles, trailers and semi-trailers
30	Manufacture of other transport equipment
31	Manufacture of furniture
32	Other manufacturing
33	Repair and installation of machinery and equipment

ANNEXURE XVIII

Description of 3-digit NIC groups pertaining to the Manufacturing Sector in NIC 2008

101	Processing and preserving of meat
102	Processing and preserving of fish, crustaceans and molluscs
103	Processing and preserving of fruit and vegetables
104	Manufacture of vegetable and animal oils and fats
105	Manufacture of dairy products
106	Manufacture of grain mill products, starches and starch products
107	Manufacture of other food products
108	Manufacture of prepared animal feeds
110	Manufacture of beverages
120	Manufacture of tobacco products
131	Spinning, weaving and finishing of textiles
139	Manufacture of other textiles
141	Manufacture of wearing apparel, except fur apparel
143	Manufacture of knitted and crocheted apparel
151	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness; dressing and dyeing of fur
152	Manufacture of footwear
161	Sawmilling and planing of wood
162	Manufacture of products of wood, cork, straw and plaiting materials
170	Manufacture of paper and paper products
181	Printing and service activities related to printing
182	Reproduction of recorded media
191	Manufacture of coke oven products
192	Manufacture of refined petroleum products
201	Manufacture of basic chemicals, fertilizer and nitrogen compounds, plastics and synthetic rubber in primary forms
202	Manufacture of other chemical products
203	Manufacture of man-made fibres
210	Manufacture of pharmaceuticals, medicinal chemical and botanical products
221	Manufacture of rubber products
222	Manufacture of plastics products
231	Manufacture of glass and glass products
239	Manufacture of non-metallic mineral products n.e.c.
241	Manufacture of basic iron and steel
242	Manufacture of basic precious and other non-ferrous metals
243	Casting of metals
251	Manufacture of structural metal products, tanks, reservoirs and steam generators
252	Manufacture of weapons and ammunition
259	Manufacture of other fabricated metal products; metalworking service activities

261	Manufacture of electronic components
262	Manufacture of computers and peripheral equipment
263	Manufacture of communication equipment
264	Manufacture of consumer electronics
265	Manufacture of measuring, testing, navigating and control equipment; watches and clocks
266	Manufacture of irradiation, electro-medical and electrotherapeutic equipment
267	Manufacture of optical instruments and equipment
271	Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus
272	Manufacture of batteries and accumulators
273	Manufacture of wiring and wiring devices
274	Manufacture of electric lighting equipment
275	Manufacture of domestic appliances
279	Manufacture of other electrical equipment
281	Manufacture of general purpose machinery
282	Manufacture of special-purpose machinery
291	Manufacture of motor vehicles
292	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
293	Manufacture of parts and accessories for motor vehicles
301	Building of ships and boats
302	Manufacture of railway locomotives and rolling stock
303	Manufacture of air and spacecraft and related machinery
304	Manufacture of military fighting vehicles
309	Manufacture of transport equipment n.e.c.
310	Manufacture of furniture
321	Manufacture of jewellery, bijouterie and related articles
322	Manufacture of musical instruments
323	Manufacture of sports goods
324	Manufacture of games and toys
325	Manufacture of medical and dental instruments and supplies
329	Other manufacturing n.e.c.
331	Repair of fabricated metal products, machinery and equipment
332	Installation of industrial machinery and equipment