

A Report on

ASSESSING EMPLOYMENT GENERATION

under

Pradhan Mantri Awas Yojana (Urban)

February, 2019

NATIONAL INSTITUTE OF PUBLIC FINANCE AND POLICY
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PREFACE

As desired by the Ministry of Housing and Urban Affairs, Government of India, the National Institute of Public Finance and Policy (NIPFP) has undertaken the Study on "Assessing Employment Generation under Pradhan Mantri Awas Yojana (Urban)" (PMAY(U)). Given that the PMAY (U) is one of the flagship programs of the Government, especially in achieving the long term goal of "Housing for All by 2022", this study tries to look at the progress of the program and its impact on the economy. In this first report, as the program has huge potential for generating the employment, it tries to estimate the extent of direct as well as indirect employment generated due to PMAY (U) based on the information provided by the Ministry. In the next stage, the study would focus on the implementation issues under the program with the help of field visits to some of the States of India. I am confident that the findings of this study would significantly contribute to the on-going discussion on the issue of jobs creation in the country in the recent period.

This study is carried by Professor N. R. Bhanumurthy, Dr Dinesh Kumar Nayak, Dr Bhabesh Hazarika, Ms Tanvi Bramhe, Ms Kanika Gupta and Mr Ashok Bhakar. The findings in the report are that of the authors and the members of the Governing Body of the Institute are no way responsible for them.

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The team also conducted telephonic interviews with some of the beneficiaries to understand the inputs used in the housing construction. The team would like to thank Mani and Sri Hari Nayudu of NIPFP for their help in conducting telephonic interviews with the PMAY (U) beneficiaries. The authors are solely responsible for any errors and omissions.

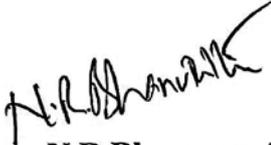

N R Bhanumurthy

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Abbreviations	
AHP	Affordable Housing in Partnership
AOR	Analysis of Rates
BLC	Beneficiary Led Construction
BLE	Beneficiary Led Enhancement
CBRI	Central Building Research Institute
CNA	Central Nodal Agency
CPWD	Central Public Works Department
CSO	Central Statistics Office
CLSS	Credit Linked Subsidy Scheme
CDS	Current Daily Status
DPR	Detailed Project Report
EWS	Economically Weaker Section
HFA	Housing for All
HFAPoA	Housing For All Plan of Action
IO	Input Output
ISSR	In-Situ Slum Redevelopment
LIG	Lower Income Group
LS	Lump Sum
MFI	Micro Finance Institution
MIG	Middle Income Group
MoHUA	Ministry of Housing and Urban Affairs
NSSO	National Sample Survey Office
NPV	Net Present Value
NBFC	Non-Banking Financial Company
PMAY (U)	Pradhan Mantri Awas Yojana-Urban
RAY	Rajiv Awas Yojana
RRB	Regional Rural Bank
Sqm	Square metre
SLSMC	State Level Sanctioning and Monitoring Committee
TG	Technical Group
UT	Union Territory
ULB	Urban Local Body

EXECUTIVE SUMMARY

To achieve the long term goal of “Housing for All (HFA) by 2022”, in June 2015 the Government of India has launched “Pradhan Mantri Awas Yojana-Urban” (PMAY(U)) scheme. Under the scheme, the aim is to construct about one crore affordable houses in the urban areas. PMAY (U) scheme provides affordable housing to the beneficiaries under four verticals - Beneficiary Led Constructions (BLC), Affordable Housing in Partnership (AHP), In-Situ Slum Redevelopment (ISSR), and Credit Linked Subsidy Scheme (CLSS). Under these verticals, the beneficiary is provided with fixed assistance from the Government of India, with additional support from the States and Urban Local Bodies (ULBs).

In this report, an attempt has been made to understand the extent of physical progress of the scheme as well as its impact on the overall employment generation. It is well known that the construction activities, especially housing are expected to have strong forward and backward linkages with other sectors in the economy. Thus, the impact of increase in housing constructions is expected to generate employment both through direct and indirect channels, which this report tries to assess for the period from June 2015 to January 2019.

As on 31st January 2019, about 72.81 lakh houses are sanctioned under PMAY (U), out of which 34.62 lakh houses are grounded. Within this, the completed houses are 11.70 lakh and houses under construction are 22.92 lakh. Based on the unit costs as well as the extent of physical progress, it is estimated that in all the four verticals the scheme could have spent about Rs. 111851.16 crore. This includes governments’ contribution as well as contribution by the beneficiaries, and bank loans. Within this, about Rs. 77736.77 crore is estimated for completed houses and Rs. 34114.39 crore for the houses under-construction.

In the case of direct employment generation, the report uses Detailed Project Reports (DPRs) for hills and plains submitted to the Ministry by the State/UTs as well as the Analysis of Rates, 2016 (CPWD). In the case of hill areas, the report uses the DPRs from Uttarakhand and in the case of plains DPRs from Tamil Nadu are used as a sample. Further, to derive

indirect employment, the report uses Input-Output (IO) Analysis. For this, the IO Table for the year 2013-14 based on Singh & Saluja (2016, 2018), which uses the CSO's Supply and Use Table 2012-13, is considered.

It is estimated that in the case of a BLC house construction in the plain area of a size of 25.3 square meter (based on average), requires about 244.5 person days of labour of which skilled labour is 72.6 person days. Similarly, in the hilly areas, it requires about 315.7 person days of which skilled labour accounts for 89.7 person days. For AHP and ISSR houses with a carpet area of 30 square metre, it is estimated that it requires about 219 person days of which 82 person days are skilled and 137 person days are unskilled labour. In the case of CLSS (EWS, LIG, MIG-I, and MIG-II), it has two types of houses- individual and flats/apartments. Here, the individual houses are considered as BLC while a flat is considered as AHP to derive the employment requirement.

Considering the number of houses grounded (both completed as well as under construction houses) in all four verticals until January 31, 2019, it is estimated that the direct employment generation is about 52.97 crore person days. Out of this, 36.00 crore person days are created through completed houses and 16.97 crore person days through under construction houses. In terms of jobs, direct employment works out to be about 18.92 lakh jobs in all the four verticals. In the case of indirect employment generation, using Input-Output method, it is estimated that the program would have generated about 119.20 crore person days in all the four verticals, which turns out to be 42.57 lakh jobs from the whole period from June 2015 to January 2019.

To sum up, the current analysis, based on the physical progress information provided by the Ministry, reveals that the PMAY (U) program has made a significant impact on employment generation in the economy. However, the analysis done in the report has limitations as it depends on few assumptions due to some data limitations. The cost and labour estimates are done on the basis of DPRs for BLC, which are only suggestive. Similarly, in the case of AHP and ISSR, the designs considered for analysis use only conventional methods of construction. Thus, any changes to those assumptions may alter the findings.

Assessing Employment Generation under Pradhan Mantri Awas Yojana-Urban

1. Introduction:

- 1.1 The problem of housing, which appears to be universal, is critical especially in the urban areas given the increased pressure of urbanisation. The issue is more critical for a country like India where the urban economy drives the growth prospect as experienced in recent decades. The rise in population size and a significant shift in migration from rural to urban has worsened the housing situation in urban India where a large number of urban population do not have a proper house with basic amenities. Often the urban poor live in over-crowded housing, self-made temporary structures in slums and squatter settlements exerting pressure on deteriorating urban infrastructure and social services (Diogu, 2002; Olotuah & Bobadoye, 2009). These altogether are making the standard of living of the urban poor vulnerable that needs a special focus towards providing affordable housing to this section of the society.

- 1.2 Report of the Technical Group on Urban Housing Shortage (TG-12)¹ brought out the problem of housing shortage and suggested the ways to fill the gap between the stock of affordable houses and the number of prospective beneficiaries as well as providing more new affordable houses (Government of India, 2012). The TG-12 report estimated the housing shortage in urban India to be about 187.8 Lakh in 2012. In order to address this issue, Government of India has launched Pradhan Mantri Awas Yojana (Urban) scheme in June 2015. The scheme aims to construct about one Crore affordable houses under the flagship program “Housing for All (HFA) by 2022” with the basic amenities.

¹ The committee was constituted under the chairmanship of Prof Amitabh Kundu.

- 1.3 The extent of investment in the housing sector has both direct and indirect effects on other sectors of the economy. Due to the strong interlinkage between various sectors of an economy, any investment made in one sector has multiplier effects on other sectors, inducing economy-wide growth and employment opportunities. This is more so in the construction sector, which has strong backward and forward linkages with other sectors of the economy. The housing sector appears as one of the major employment generating sectors. In this context, investment made towards addressing the housing shortage offers an opportunity to stimulate growth in the economy as the sector is recognized for its potential for generating employment.
- 1.4 This report covers the broader objective to estimate the employment generated, both through direct and indirect channels, due to the PMAY (U) construction activities. This report also analyses the trends and performance of the scheme (both physical and financial) since the inception and up to January 31, 2019.

2. About the Scheme and the Issues

- 2.1 Pradhan Mantri Awas Yojana - Urban provides Central Assistance to the implementing agencies through States/UTs for housing construction for eligible urban families/beneficiaries in four components:
- a) Beneficiary-led Construction (BLC) New / Enhancement (BLE)
 - b) Affordable Housing in Partnership (AHP)
 - c) In-situ Slum Redevelopment (ISSR)
 - d) Credit Linked Subsidy Scheme (CLSS)
- 2.2 PMAY (U) is primarily a demand-driven scheme unlike rural housing scheme, which is a supply-driven scheme. A beneficiary of the scheme is eligible to take benefit under only one component based on the household income level and other eligibility criteria. States/UTs are responsible for deciding at their discretion a cut-off date (preferably through legislation) for the urban dwellers to be eligible under the scheme.

2.3 A beneficiary family will comprise husband, wife and unmarried children. The beneficiary family should not own a pucca house (an all-weather dwelling unit) either in his/her name or in the name of any member of his/her family in any part of India (MoHUA, 2017).

2.4 Further, the beneficiaries are categorised based on their vulnerability status and different income segments such as Economically Weaker Section (EWS), Lower Income Group (LIG), Middle Income Group – I or II (MIG-I, MIG-II). Some of the salient features of this scheme are presented in Table 1.

2.5 A number of inter-sector transactions must have occurred due to the investment made in PMAY (U) leading to increased demand for construction related materials. As a consequence, there will be employment generation through both direct and indirect channels.

2.5.1 **Direct Employment**

Here following questions needs to be empirically addressed to assess the direct employment

- i. How many person days of work has been generated due to accelerated activities under PMAY (U) with respect to completed and under construction houses?
- ii. What is the employment potential of a house of approximately 30 sqm under the different components of PMAY (U)?
- iii. What is the extent of demand for construction materials such as sand, cement, brick, steel, sanitary wares, tiles, marbles, etc., under different components of the scheme in addition to employment created in ancillary sectors?

2.5.2 **Indirect Employment**

- i. How many person days could be generated in ancillary services such as plumbing, electrical fittings, carpentry, etc., due to the PMAY (U) construction?
- ii. What is the extent of indirect employment generated due to increased demand for construction materials?

Table 1: Salient features of four components in PMAY (U)

Features	ISSR	CLSS	AHP	BLC ^Ψ
Beneficiary	Slum dwellers	Slum (those who are not being taken in ISSR) and Non-slum dwellers		
Household annual income criteria*	EWS	EWS and LIG; MIG (later included since January 2017)	Mix of all, but at least 35% houses are for EWS and a single project has at least 250 houses*	EWS
Carpet area** in square meter (sqmt)	Up to 30 sqmt	Up to 30 sqmt for EWS; 60 sqmt for LIG; 160 sqmt for MIG-I; 200 sqmt for MIG-II	Up to 30 sqmt for EWS category house	Up to 30 sqmt
Central Government ^{Ψ Ψ} grant/subsidy/assistance per house	Rs. 1.00 Lakh grant per house and land as resource	Sanction of interest subsidy# @6.5% loans up to Rs. 6 Lakh for EWS, LIG, @4% loans up Rs. 9 Lakh for MIG-I, @3% loans up to Rs. 12 Lakh for MIG-II	Rs. 1.50 Lakh per EWS house	Rs. 1.50 Lakh per house
Release of Central Assistance	3 instalments of 40%, 40%, and 20% each	Quarterly basis after 70% utilization of earlier amounts and based on claims raised by Central Nodal Agencies (CNAs)	40%, 40%, and 20% each	3 instalments
Lending Institutions	Scheduled Commercial Banks, Housing Finance Companies, Regional Rural Banks (RRBs), State Cooperative Banks, Urban Cooperative Banks, Small Finance Banks, Non-Banking Financial Company-Micro Finance Institutions' (NBFC-MFIs) or any other institutions as may be identified by the Ministry.			
Implementing agency	Urban Local Bodies (ULBs)/ Development Authority/ Housing Board/ Urban Improvement Trust/ Designated Slum Rehabilitation Agency/ Private agency/ Developer			

Note: *States/UTs discretion in consultation with Centre,

**Size varies by States/UTs in consultation with Ministry but without any enhanced funding assistance from Centre.

#Loan tenure of maximum 20 years, calculated at Net Present Value (NPV) basis,

##Carpet area for MIG became operational with effect from date 01.01.2017

^Ψ BLC consist of new house construction and enhancement

^{Ψ Ψ} In addition to Central government assistance, State government/UTs including ULBs has also major role in terms of financial assistance, and it varies across State/ UTs. The highest ranges of such assistance are Rs. 6 Lakh in Tamil Nadu under AHP and Rs. 2 Lakh in Gujrat under BLC.

Source: Compiled from *Housing for All*, PMAY (U) Guidelines, MoHUA, Government of India.

3. Objectives of the Report

3.1 The primary objective in the first part of the study is to estimate the impact of construction of houses under PMAY (U) across urban India on employment generation. The study has tried to bring out how investments made in affordable housing sector is generating direct as well as indirect employment.

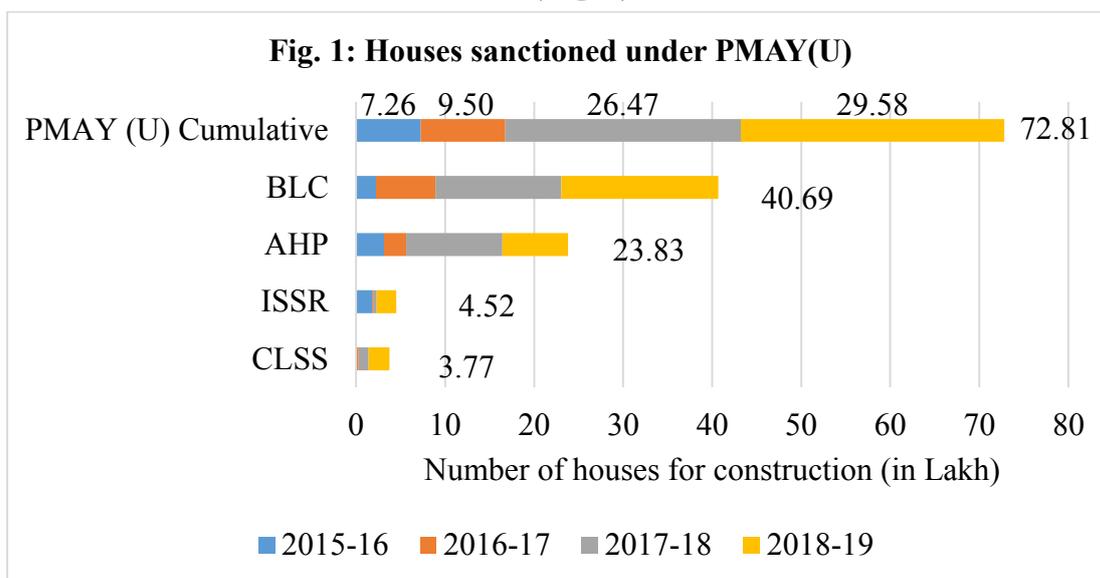
3.2 This report broadly focuses on the following objectives:

- i. To estimate the total employment generated (in person days as well as jobs) under PMAY (U) due to accelerated construction activities with respect to number of houses sanctioned as well as constructed. The study estimates separately for completed and under construction houses.
- ii. To arrive at suggestive norms for calculation of potential employment generation in terms of person days for each house of approximately 30 sq mts under the scheme.
- iii. To assess the backward and forward linkages and impact of investment in housing sector on overall economy. Here the study tries to estimate the impact on employment generation due to increased demand for sand, cement, brick, aggregate, steel, etc., due to increased construction activities.
- iv. Direct demand for constructions services in the informal sector such as plumbing, electrical fittings, carpentry, etc., as a result of increase in the construction activities would also be studied. Impact on production of other supplements which are required for building a house such as sanitary ware, tiles, marble, etc., will also be assessed.

4. Progress and Trends of PMAY (U) construction

4.1 The scheme has been operationalised in 35 States and UTs covering 4331 cities/towns and 15263 project proposals since its

implementation. As on 31st January 2019, 72.81 Lakh PMAY (U) houses has been sanctioned (Fig.1)².



Source: Compiled from “At a Glance PMAY (U)” (MoHUA, 2019).

4.2 The State/UT level physical and financial progress are shown in Appendix 1. Tamil Nadu and Uttar Pradesh are the States with more than two thousand approved project proposals as on January 2019. During that period, more than one thousand project proposals have been considered in Karnataka, Madhya Pradesh, and Chhattisgarh. The percentage of completed houses out of grounded for construction is higher in UTs as compared to States.

4.3 Physical progress of the PMAY (U) program is shown in Table 2. The total number of houses sanctioned from June, 2015 to January, 2019 are 72.81 Lakh of which the total grounded houses are 34.62 Lakh. Out of the total houses grounded the total houses completed and under-construction are 11.70 Lakh and 22.92 Lakh respectively. The number of self-constructed or individual type houses (BLC and individual CLSS) completed and under construction houses are 6.30 Lakh and 13.49 Lakh respectively. Under the Apartment type houses (AHP, ISSR and Apartment CLSS) together, the total houses completed and under-construction are 3.81 Lakh and 9.06 Lakh respectively. Over all

² In all the tables and figures, the information for 2015-16 is from 1st June 2015 and for 2018-19 it is only up to 31st January, 2019

the completion rate is about 31 per cent (ratio of completed to grounded).

Scheme	Year	Sanctioned	Grounded	Completed	Under construction
BLC, CLSS (Individual)	2015-16	2.27	1.62	1.12	0.50
	2016-17	6.75	5.45	1.93	3.52
	2017-18	14.43	9.82	2.66	7.16
	2018-19	18.30	3.17	0.86	2.31
	Total	41.75	20.06	6.57	13.49
AHP, ISSR, CLSS (Apartment)	2015-16	4.99	4.15	1.52	2.63
	2016-17	2.75	1.60	0.48	2.13
	2017-18	12.04	6.63	1.27	6.09
	2018-19	11.29	2.19	1.85	0.83
	Total	31.06	14.56	5.13	9.43
PMAY (U)	2015-16	7.26	5.77	2.64	3.13
	2016-17	9.50	7.04	2.40	5.65
	2017-18	26.47	16.45	3.94	13.25
	2018-19	29.58	5.36	2.72	3.14
	Total	72.81	34.62	11.70	22.92

Source: Compiled from data provided by MoHUA, 2019. This includes RAY.

4.4 The total expenditure incurred, both cumulative and year-wise, on the PMAY (U) program is shown in Appendix 7. Since inception and up to January 31st, 2019, it is estimated that a total of Rs. 1,11,851.16 Crore has been spent on the entire scheme, this includes governments' contribution as well as contribution by the beneficiaries, and bank loans. The expenditure on individual type houses that includes BLC and individual CLSS is about Rs. 37,417.59 Crore. Similarly, under the Apartment type houses (AHP, ISSR and Apartment CLSS) an expenditure of Rs. 74,433.58 Crore has been made.

4.5 The physical and financial performance of the BLC component of PMAY (U) is shown in Table 3. Since the inception of the program till date there are 40.69 Lakh BLC (new house construction and enhancement) houses were sanctioned of which 19.01 Lakh are grounded. Out of the total grounded houses around 5.52 Lakh have been completed and the remaining 13.49 Lakh are under construction, with a completion rate of 29 per cent. Around 2.25 Lakh houses were sanctioned in the initial year, i.e. 2015-16, out of which the construction of 1.10 Lakh houses were completed with

an expenditure of Rs. 4258.54 Crore. Among the houses grounded in 2015-16, 0.50 Lakh houses are still under construction. The number of completed and under construction houses are maximum for the year 2017-18 (2.36 Lakh and 7.16 Lakh respectively) with the maximum expenditure of Rs. 8,325.04 Crore and Rs. 4,430.62 Crore. The total expenditure incurred on completed and under-construction houses under the BLC (both new house construction and enhancement) for the period from June 2015 to January 2019 is estimated to be Rs. 19,509.42 Crore and Rs. 8,117.74 Crore, respectively.

Table 3: Performance of BLC Component of PMAY (U)							
Year	Physical Progress (No. in Lakh)				Financial Progress (Rs. in Crore)		
	Sanctioned	Grounded	Completed	Under construction	Completed	Under construction	Total
2015-16	2.25	1.60	1.10	0.50	3890.57	367.97	4258.54
2016-17	6.68	5.37	1.85	3.52	6607.66	2570.53	9178.19
2017-18	14.13	9.52	2.36	7.16	8325.04	4430.62	12755.66
2018-19	17.63	2.51	0.20	2.31	686.14	748.62	1434.77
Total	40.69	19.01	5.52	13.49	19,509.42	8,117.74	27,627.15

Note: The financial progress is from actual expenditure instead of total release by the Government.
Source: Compiled from data provided by MoHUA, 2019.

4.6 Table 4 shows the year-wise percentage of Beneficiary Led Enhancements (BLE) houses under the BLC vertical of PMAY (U). The total number of houses sanctioned and grounded under the BLE component are 1,95,871 and 44,065 respectively, of which 3,735 have been completed and as many as 40,330 houses are under-construction. The total completed enhancement houses are approximately 0.47 per cent of the total completed houses in the BLC vertical.

Table 4: Percentage share of Enhancement houses in BLC, year-wise				
Year	Sanctioned	Grounded	Completed	Under construction
2015-16	0.00	0.00	0.00	0.00
2016-17	2.90	1.36	0.25	1.94
2017-18	5.75	2.18	0.71	2.66
2018-19	5.40	6.39	7.88	6.26
Total	4.81	2.32	0.68	2.99
In Numbers	1,95,871	44,065	3,735	40,330

Source: Compiled from data provided by MoHUA, 2019.

4.7 Physical and financial performance of AHP component is presented in Table 5. Total AHP houses sanctioned and grounded are 23.83 Lakh and 10.30 Lakh respectively, out of which 1.57 Lakh houses are completed and 8.73 Lakh houses are at under construction stage, with completion rate of 15 per cent. Total expenditure incurred from June 2015 to January 2019 is Rs. 33,591.14 Crore of which Rs. 9,100.49 Crore has been incurred on completed houses and remaining Rs. 24,490.65 Crore is incurred on houses under construction.

Table 5: Performance of AHP Component of PMAY (U)							
Year	Physical Progress (in Lakh)				Financial Progress (Rs.in Crore)		
	Sanctioned	Grounded	Completed	Under construction	Completed	Under construction	Total
2015-16	3.15	2.64	1.27	1.37	7362.26	6361.07	13723.32
2016-17	2.49	1.40	0.06	1.33	355.34	4651.72	5007.06
2017-18	10.82	5.78	0.20	5.57	1187.80	12946.75	14134.54
2018-19	7.37	0.49	0.03	0.46	195.10	531.12	726.22
Total	23.83	10.30	1.57	8.73	9,100.49	24,490.65	33,591.14

Note: The financial progress is from actual expenditure instead of total release by the Government.
Source: Compiled from data provided by MoHUA, 2019.

4.8 Physical and financial progress of ISSR component is presented in Table 6. The total ISSR houses sanctioned since June 2015 to January 2019 are 3.09 Lakh. Out of which 0.34 Lakh are grounded and only 0.024 Lakh houses have been completed and as many as 0.32 Lakh houses are still at different stages of construction. The completion rate of 7 per cent under ISSR is the lowest. Independently, the Ministry may like to look at the reasons for low completion rate under ISSR. The total expenditure incurred on ISSR houses, up to January 2019 is Rs. 1,656.89 Crore, out of which Rs.150.89 Crore is incurred on completed houses and Rs.1,506 Crore is incurred on under construction houses. It is also important to note that despite many houses are grounded there are no houses completed during 2016-17 and 2017-18. Further, in the year 2018-19, there are no houses grounded under the vertical yet.

Table 6: Performance of ISSR Component of PMAY (U)							
Year	Physical Progress (in Lakh)				Financial Progress (Rs. in Crore)		
	Sanctioned	Grounded	Completed	Under construction	Completed	Under construction	Total
2015-16	0.37	0.27	0.02	0.25	150.89	1254.32	1405.21
2016-17	0.11	0.05	0.00	0.05	0.00	191.87	191.87
2017-18	0.39	0.02	0.00	0.02	0.00	59.81	59.81
2018-19	2.22	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.09	0.34	0.02	0.32	150.89	1506.00	1656.89

Note: The financial progress is from actual expenditure instead of total release by the Government.
Source: Compiled from data provided by MoHUA, 2019.

4.9 The year-wise performance of CLSS component is presented in Table 7. As informed by the MoHUA, the information presented in Table 7 are for new houses that are completed. Since our objective is to estimate employment generation, the old houses that were bought under the vertical are not considered. The number of such new CLSS houses are 3.01 Lakh for which a total loan amount of Rs. 48975.97 Crore is incurred for the period from June, 2015 up to January, 2019.

Table 7: Performance of CLSS (all new houses only) Component of PMAY (U)						
Year	Physical Progress: completed (in Lakh)			Loan amount (in Crore)		
	Individual	Apartment	Total	Individual	Apartment	Total
2015-16	0.01	0.02	0.03	72.65	167.47	240.12
2016-17	0.07	0.15	0.22	623.72	1555.19	2178.90
2017-18	0.23	0.69	0.92	2763.64	11706.77	14470.41
2018-19	0.47	1.37	1.84	6330.42	25756.12	32086.54
Total	0.78	2.22	3.01	9,790.43	39,185.54	48,975.97

Source: Compiled from data provided by MoHUA, 2019.

5. Analytical Framework

5.1 Assessing the PMAY (U) Employment

5.1.1 In order to assess the extent of employment (direct and indirect) through PMAY (U), this report uses secondary data of both

completed and under construction housing structures. The secondary data were collected from the MoHUA for all four verticals of PMAY (U) (BLC, AHP, ISSR and CLSS) from June 2015 up to January 2019. In addition, the report utilizes primary data through field-visits and telephonic interview with the beneficiaries to verify the employment outcomes. The analysis is carried out separately for direct and indirect employment as well as completed and under construction stages. Here, the distinction is also made between skilled and unskilled employment specific to direct employment.

5.1.2 Detailed Project Report (DPRs) submitted by the State to the Ministry has been analysed for different housing designs used for construction in the hilly and plain areas. This gives the direct employment (in person days) and direct demand for the construction-related materials. The Research team has visited States of Uttarakhand and Andhra Pradesh to discuss with various stakeholders such as beneficiaries, functionaries, implementing agencies, construction workers, etc. on housing construction in general and labour and material inputs in particular. The beneficiaries of BLC component has also been asked through telephonic interview regarding the process of housing construction and labour days utilized (for skilled and unskilled workers).

5.1.3 The generation of indirect employment due to investment under PMAY (U) has been addressed through Input-Output analysis (NIPFP, 2018). The Input-Output analysis gives estimate for the different sectors in aggregate.³ However, the Input-Output analysis generates only the number of jobs per unit of investment, which needs to be converted into person days.

5.1.4 To convert the employment numbers from number of jobs into person days and vice-versa, this report has analysed unit level data from NSSO 68th round Employment and Unemployment Survey (2011-12). This report has estimated the average number

³ The latest Input-Output table is available for is 2013-14 constructed by Singh and Saluja (2016, 2018) that gives estimates for 130 sectors. The present study has used the IO table for 2013-14.

of work-days in last seven days of a week according to Current Daily Status (CDS) activity of a worker worked as casual labour in public works. The estimated average number of work days per week is found to be 5.368 days considering for usual status (principal and subsidiary) activity for age category of 15 years and above, which is equivalent to 280 days in a year. In other words, it can be interpreted as 280 person days of work employment is equal to one gainful job generated, or in other way, it explains that one employed person works for 280 days in a year, on an average, under both principal and subsidiary status.

5.2 Direct Employment

5.2.1 **Estimations for required inputs (materials and labour):** PMAY (U) scheme focuses on providing pucca houses to the urban poor. To avail the housing facility the beneficiary is allowed to choose from four different verticals- ISSR, CLSS, AHP and BLC. Estimations with regard to inputs (materials and labour) for these verticals are done on the basis of Detailed Project Reports (DPRs) and Analysis of Rates, CPWD (2016).

5.2.2 **BLC:** As per the operational guidelines of PMAY (U), ULBs prepare an integrated city wide housing project and develop DPRs, in accordance with the overall validated demand received in the city and corresponding Housing For All Plan of Action (HFAPoA). The projects are approved by States in State Level Sanctioning and Monitoring Committees (SLSMCs). For the estimation of total material and labour required, DPRs from Tamil Nadu (Kattumannarkoil, Cuddalore district) and Uttarakhand (Chinyalisaur, Uttarkashi District) have been selected to be representative for plains and hills, respectively.

5.2.3 **Design details for BLC houses:** The designs in the DPRs include disaster resilient features depending upon the location of the respective city. Due to variations in the nature of disasters occurring in these places there is difference in the quantities of material used for construction of houses. The detailed

estimations after making necessary adjustments are given below for designs in both plains and hills.

5.2.4 Assumptions for BLC house estimation: As we need to understand the direct as well as indirect impact of construction of houses on both employment and expenditure, disaggregation of the whole construction output is required, especially into materials and labour. Following assumptions were made for estimating the value of materials and labour.

- i. The wage rates for labour (both skilled and unskilled) as provided by the State officials of Tamil Nadu and Uttarakhand for plains and hills respectively, have been considered.
- ii. The rates of construction material like cement, sand, stone chips, steel, hard stone, etc., as provided by respective State officials have been taken as basis of calculation
- iii. In the calculation for sand, both coarse and fine sand are included
- iv. In the case of steel, it includes steel used for reinforcement, chicken mesh, rod-binding wire, etc.
- v. Miscellaneous category includes cost of electrical fittings, wirings and sanitary ware.
- vi. As suggested by the Central Building Research Institute (CBRI), Roorkee, following conversion is used to convert the material's quantity into standard units: 1 Bag of cement weighs 50 kg.; and each kilogram of materials (cement, sand, stone chips) equals to density of materials multiplied by quantity in cubic metre (NIPFP, 2018).
- vii. The standard units for converting the required amount of cubic metre of material into Kgs, the density (kg per cubic metre) of the materials as per CBRI, Roorkee, for cement, sand, stone chips (aggregate) are 1440, 1600, and 2400, respectively.
- viii. The carpet area for construction of new house under BLC house is taken as 25.33 sq. m. It is the average carpet area of construction as given in DPRs of few States such as Madhya Pradesh, Uttar Pradesh, Jharkhand, Uttarakhand, and Meghalaya. On the other hand, there is no such

information for enhancement houses under BLC available, hence, as suggested by the Ministry, it is assumed at 15 sq. m. for the enhancement houses.

Table 8: Labour Input (person days) for Construction of Dwelling Unit under BLC						
<i>Estimate for 25.33 sqm DU</i>						
Stages of construction work	Plains			Hills		
	Skilled	Unskilled	Total	Skilled	Unskilled	Total
Foundation + plinth	14.33	41.08	55.41	21.70	63.23	84.93
Lintel	13.96	46.47	60.43	13.82	52.17	65.99
Roof	9.51	26.46	35.97	12.98	34.81	47.79
Finishing	34.78	58.08	92.86	41.20	75.78	116.98
Total	72.57	172.09	244.46	89.71	225.99	315.70
<i>Note:</i> Labour inputs are estimated from Analysis of Rates (AOR) based on Central Public Work Department (CPWD), Government of India, 2016						
<i>Source:</i> Estimated from DPRs of Tamil Nadu (for Plains), and Uttarakhand (for Hills)						

5.2.5 Table 8 shows the total and stage-wise number of person days required in both plain and hilly regions for the construction of one BLC dwelling unit of size 25.33 square metre. A total of 244.46 person days is required in plains of which skilled labour required is 72.57 person days. In hilly regions, 315.70 person days is required of which 89.71 person days of skilled labour and 225.99 person days of unskilled labour is required during the construction of a dwelling unit of the specific carpet area size. The finishing stage requires the maximum number of person days of both skilled and unskilled labour in both plains and hilly areas (Appendices 2 and 3).

5.2.6 There is a difference in the total unit cost given in the DPRs and the estimates assumed in this report. The differences are mainly due to higher cost of material and labour wages, compared to the DPRs, as per given market prices provided by the respective State governments.

5.2.7 The cost composition of PMAY (U) house reveals that construction materials being the major component in the overall expenditure is approximately 60-70 per cent while the labour cost is approximately 30-40 per cent. In the total labour cost, the skilled

labour cost is around 35-40 percent while the unskilled labour cost is around 60-65 per cent.

5.2.8 The average cost per square metre estimated to be Rs. 13,637 and Rs. 15,784 for plains and hills, respectively.⁴ The differences in the cost between plains and hills is due to the fact that the transportation cost is higher in the hills owing to the difficult terrain.

5.2.9 **Verification from the field:** The required labour days and material inputs for BLC dwelling units estimated from DPRs are cross-verified with the primary data by conducting telephonic interviews with the BLC beneficiaries. Telephonic interview conducted for 70 beneficiaries across seven States by the NIPFP team. It provides the details with regard to average area of houses, average number of labour days spent for the construction (Appendix 4). From this information, labour input spent per square metre of housing construction is derived. The average labour requirement for the construction of a house (average area 47.36 sq. m.) comes to about 520.93 person days of which the number of skilled and unskilled labour required are 180.5 person days and 340.42 person days, respectively. For one square meter the number of labour required is 11 person days which is inclusive of 3.81 skilled person days and 7.19 unskilled person days. It may be noted that in both the States (Tamil Nadu and Uttarakhand), the estimations based on both DPRs and through telephonic interviews are almost similar.

5.2.10 **Assumptions for AHP and ISSR house estimation:** Keeping in view the similar structure of G + 3 houses in the two verticals i.e., AHP and ISSR, we have considered same assumptions for both the components in estimating the dwelling units as well as costs of construction in different stages of construction activities (under-construction). Due to lack of information with regard to the different stages of construction, it is assumed that the houses under construction would have completed by 80 per cent, 60 per cent, 40 per cent and 20 per cent for the houses

⁴ The per square cost is estimated from DPRs with a carpet area of 30 square metre.

sanctioned in 2015-16, 2016-17, 2017-18, and 2018-19, respectively. The unit cost for AHP and ISSR dwelling units are assumed at Rs. 5.81 Lakh and Rs. 6.23 Lakh per house, respectively, which are the average unit cost estimated across various States under these two verticals. The labour requirement per unit house for AHP of carpet area of 30 square metre is 219 person days of which 82 person days are skilled and 137 person days are unskilled labour, and the same is assumed for ISSR houses.⁵ (Table 9)

Table 9: Labour (person days) Input for the construction of a Dwelling Unit under AHP, ISSR, and CLSS (Apartment)			
<i>Estimate for 30 sqm DU</i>			
Stages of construction work	Skilled	Unskilled	Total
Foundation + plinth	5	18	23
Lintel	15	41	56
Roof	15	23	39
Finishing	47	55	102
Total	82	137	219

Source: Estimated from the information collected in field-visit of Andhra Pradesh

5.2.11 **Assumptions for CLSS house estimation:** The CLSS (EWS, LIG, MIG-I, and MIG-II) vertical of PMAY (U) aims to expand institutional credit flow by providing interest subsidy on home loans to the beneficiaries through banks for acquisition of old house or construction of new house. The beneficiary can avail the interest subsidy on housing loan under two types of houses i.e., individual construction and Apartment. The calculation for direct employment generated by the individual CLSS is derived on the basis of BLC component; and Apartment CLSS is derived on the basis of AHP component. The carpet area of EWS, LIG, MIG-I and MIG-II under CLSS are assumed to be 30 sq. m., 60 sq. m., 160 sq. m., and 200 sq. m., respectively. However, the estimation of indirect employment generated by CLSS is derived on the basis of loan amount as information provided by the MoHUA (at 2011-12 constant prices).

⁵ The carpet area for AHP and ISSR houses are assumed to be 30 square metre; and the labour requirement for per unit AHP house is derived from the information collected during the field-visit conducted in Andhra Pradesh.

5.3 Indirect Employment using Input-Output Analysis

5.3.1 Apart from the direct employment generated due to the PMAY (U) program, the construction activities create demand for the construction materials as well as auxiliary services such as cement, steel, bricks (clay products), etc. The increased demand thus creates employment opportunities in these segments which is termed as indirect employment due to the PMAY (U) construction activities. However, while estimating for economy wide employment, the indirect employment may not be counted, as indirect employment in housing sector could be direct employment in other sector. In this section, we present the extent of indirect employment generated in some selected sectors related to construction activities.

5.3.2 In estimating the employment generated in overall economy due to an increased demand (investment) in a particular sector, the Input-Output (I-O) analysis is used most frequently in the literature (Leontief, 1936; Munjal et al., 2014; NIPFP, 2018). The IO analysis is widely used as an analytical tool to analyse the inter-linkages between the sectors of an economy through the use of Leontief Inverse Matrix, which is also known as ‘multiplier matrix’ (Leontief, 1936). The method allows the estimation of both direct and indirect impacts of a particular sector on different parameters of economic performance. The structure of the IO analysis consists of the inter-sector flows of products from sector ‘i’ to sector ‘j’ as intermediate/primary input in order to produce one unit of output of sector ‘j’. The IO table essentially populates the numerous transaction in monetary terms amongst the sectors i.e., from sector ‘i’ to sector ‘j’. The inter-sectoral transactions give a set of linear relationships that describe the input-requirements and output distribution of each sector of the economy.

5.3.3 The IO method thus based on the core concept of technical coefficient (a_{ij}) that refers to the amount of input from sector ‘i’

required to produce one unit of output of the sector ‘j’ and is expressed given as below.

$$a_{ij} = \frac{X_{ij}}{X_j}; i, j = 1, 2, 3, \dots, n$$

Given that the IO table is presented in monetary terms, a_{ij} gives the proportional value of the input purchased from all sectors per monetary unit of output. The basic final demand equation in the Input-Output table is given below.

$$X_j = \sum_{j=1}^n a_{ij}X_j + F_j$$

In matrix notation

$$(I-A)X=F$$

$$X = (I - A)^{-1}F$$

5.3.4 Here A ($n \times n$) is the technical coefficient matrix, X ($n \times 1$) is the vector of outputs and F ($n \times 1$) is the vector of final demand. The column sum of the technical coefficient matrix reflects the input structure of the respective sector. The matrix $(I - A)^{-1}$ is known as the Leontief Inverse matrix or the multiplier matrix which is the key component for deriving the specific multiplier.

5.3.5 The employment multiplier of j^{th} sector gives the creation of additional employment in the economy due to an increase in its final demand by one unit. It is derived as $\sum_{i=1}^n l_i r_{ij}$, where l_i is the row vector of employment coefficients for different sectors and r_{ij} is the Leontief inverse matrix. It measures the direct and indirect employment created in the economy when the final demand for j^{th} sector increases by one unit. It should also be noted the additional job creation in the economy can also be interpreted in relation to direct employment in a particular sector. This can be expressed as the ratio of total additional employment in the economy to the employment generated in a sector.

5.3.6 For the analytical purpose, the present study will use the benchmark estimates from the 130 sector (commodity \times commodity) IO Table 2013-14 of India given by Singh & Saluja (2016, 2018) based on the CSO Supply and Use Table 2012-13.

- 5.3.7 The employment multiplier is generated⁶ using the NSSO 68th round on *Employment and Unemployment Situation in India, 2011-12*. The NSSO definitions of usual activity status (principal and subsidiary) is considered herein defining the employment (no of jobs)⁷. Further, the employment numbers were derived for the 130 sectors given in the IO Table 2013-14 using the NIC 2008 codes.⁸
- 5.3.8 The employment multiplier is used to derive the number of jobs generated in different sectors due to the investments made for the construction of affordable houses under PMAY (U).
- 5.3.9 The construction of housing is a sub-component of the construction sector as a whole (Appendix 9). As the IO 2013-14 does not give a separate multiplier for housing sector alone, the construction sector multiplier is used as a proxy for the urban housing sector. The investment made (total expenditure) in the urban housing program (including beneficiary contribution as estimated by the MoHUA) generate an increased demand for the sector in specific and construction sector as a whole. This will create direct employment for the labour, and due to the interlinkages across the different sectors, there will be indirect employment as well.
- 5.3.10 As the employment figures are derived from 2011-12 round and the IO Table is based on the new series data with 2011-12 as the base year, the expenditure figures on the PMAY (U) are deflated using the construction sector deflated to make it comparable/consistent with the IO Table 2013-14 estimates (Appendices 5, 6 and 7).

⁶ Although in Singh & Saluja (2016, 2018), the employment multiplier is available, the number of employment was not presented in their IO Table 2013-14, and, hence, we had to generate the employment numbers for the sectors. However, because of discrepancies in mapping the multipliers might be marginally different to that of the Singh and Saluja (2016, 2018).

⁷ For Activity status, please refer to Appendix 8.

⁸ For detail mapping of sectors, please refer to Appendix 9.

5.3.11 However, the limitation of IO Table lies on the assumption of constant input coefficient under the projected conditions implying its suitability in short run projections. In long run, the input coefficients might change and thus, the reliability on the fixed input coefficient weakens.

6. Empirical Findings

6.1 This section presents empirical results with regard to employment generation in terms of direct, indirect and total employment for the total number of houses grounded (for both completed and under construction) in each vertical till January 31st 2019. Employment generated in person days (in Crore) are shown in Table 10 and in terms of jobs (in Lakh) are shown in Table 11.

6.2 Direct employment generated due to PMAY (U)

6.2.1 The total direct employment generated under the PMAY (U) program cumulative for the period from June, 2015 up to January, 2019 is 52.97 Crore person days (18.92 Lakh jobs). Out of the total direct employment generated, the construction of individual type houses (BLC and individual CLSS) alone generated 26.17 Crore person days (9.35 Lakh jobs), and construction of Apartment type houses (AHP, ISSR, and Apartment CLSS) generated 26.80 Crore person days (9.57 Lakh jobs).

Table 10: Employment (person days) Generated Year-wise under PMAY (U) from June 2015 upto January 31, 2019 (in Crore)											
Scheme	Year	Direct			Indirect			Total			
		Completed	Under Construction	Total	Completed	Under Construction	Total	Completed	Under Construction	Total	
BLC, CLSS (Individual)	2015-16	2.74	0.26	3.00	4.45	0.41	4.87	7.19	0.67	7.86	
	2016-17	4.97	1.86	6.84	7.94	2.82	10.76	12.91	4.68	17.59	
	2017-18	7.22	3.88	11.10	11.83	4.72	16.55	19.05	8.60	27.65	
	2018-19	4.02	1.22	5.24	7.13	0.76	7.89	11.15	1.98	13.14	
Sub Total		18.95	7.22	26.17	31.35	8.72	40.07	50.30	15.94	66.24	
AHP, ISSR, CLSS (Apartment)	2015-16	2.89	2.84	5.73	8.63	8.56	17.19	11.52	11.39	22.91	
	2016-17	0.63	1.82	2.45	2.10	5.31	7.41	2.73	7.13	9.86	
	2017-18	4.52	4.90	9.42	13.75	13.87	27.62	18.27	18.77	37.04	
	2018-19	9.00	0.20	9.20	26.38	0.54	26.92	35.38	0.74	36.12	
Sub Total		17.05	9.75	26.80	50.86	28.28	79.14	67.91	38.03	105.94	
PMAY (U)	2015-16	5.63	3.09	8.72	13.08	8.97	22.05	18.71	12.06	30.77	
	2016-17	5.61	3.68	9.29	10.03	8.14	18.17	15.64	11.82	27.46	
	2017-18	11.74	8.77	20.51	25.58	18.60	44.17	37.32	27.37	64.69	
	2018-19	13.02	1.42	14.45	33.51	1.30	34.81	46.54	2.72	49.26	
Grand Total		36.00	16.97	52.97	82.20	37.00	119.20	118.20	53.97	172.17	
Source: NIPFP estimations.											

Table 11: Number of Jobs (for 280 days in a year)												(in Lakh)	
Scheme	Year	Direct			Indirect			Total					
		Completed	Under Construction	Total	Completed	Under Construction	Total	Completed	Under Construction	Total			
BLC, CLSS (Individual)	2015-16	0.98	0.09	1.07	1.59	0.15	1.74	2.57	0.24	2.81			
	2016-17	1.78	0.67	2.44	2.83	1.01	3.84	4.61	1.67	6.28			
	2017-18	2.58	1.38	3.96	4.22	1.69	5.91	6.80	3.07	9.87			
	2018-19	1.44	0.44	1.87	2.55	0.27	2.82	3.98	0.71	4.69			
Sub Total		6.77	2.58	9.35	11.19	3.11	14.31	17.96	5.69	23.66			
AHP, ISSR, CLSS (Apartment)	2015-16	1.03	1.01	2.04	3.08	3.06	6.14	4.11	4.07	8.18			
	2016-17	0.23	0.65	0.88	0.75	1.90	2.65	0.97	2.55	3.52			
	2017-18	1.62	1.75	3.36	4.91	4.95	9.86	6.53	6.70	13.23			
	2018-19	3.22	0.07	3.29	9.42	0.19	9.61	12.64	0.26	12.90			
Sub Total		6.09	3.48	9.57	18.16	10.10	28.26	24.25	13.58	37.83			
PMAY (U)	2015-16	2.01	1.10	3.12	4.67	3.20	7.88	6.68	4.31	10.99			
	2016-17	2.00	1.32	3.32	3.58	2.91	6.49	5.58	4.22	9.81			
	2017-18	4.19	3.13	7.33	9.13	6.64	15.78	13.33	9.77	23.10			
	2018-19	4.65	0.51	5.16	11.97	0.46	12.43	16.62	0.97	17.59			
Grand Total		12.86	6.06	18.92	29.36	13.21	42.57	42.22	19.28	61.49			
Source: NIPFP estimations.													

6.2.2 The categorization of direct employment into skilled and unskilled employment generated under PMAY (U) program is shown in Table 12. Out of total direct employment generated, 17.47 Crore person days (6.24 Lakh jobs) are skilled while 35.50 Crore person days (12.68 Lakh jobs) are unskilled. At the vertical level the details with regard to skilled and unskilled direct employment is provided in Table 12.

Table 12: Skilled based Categorization of Direct Employment, year wise							
Scheme	Year	Person days (in Crore)			Jobs (in Lakh)		
		Skilled	Unskilled	Total	Skilled	Unskilled	Total
BLC, and CLSS (Individual)	2015-16	0.88	2.12	3.00	0.31	0.76	1.07
	2016-17	1.94	4.89	6.84	0.69	1.75	2.44
	2017-18	3.13	7.97	11.10	1.12	2.85	3.96
	2018-19	1.50	3.74	5.24	0.54	1.33	1.87
	Total	7.45	18.72	26.17	2.66	6.69	9.35
AHP, ISSR, and CLSS (Apartment)	2015-16	2.14	3.59	5.73	0.76	1.28	2.04
	2016-17	0.92	1.54	2.45	0.33	0.55	0.88
	2017-18	3.52	5.90	9.42	1.26	2.11	3.36
	2018-19	3.45	5.76	9.20	1.23	2.06	3.29
	Total	10.02	16.78	26.80	3.58	5.99	9.57
Direct Employment, PMAY (U)	2015-16	3.02	5.71	8.72	1.08	2.04	3.12
	2016-17	2.86	6.43	9.29	1.02	2.30	3.32
	2017-18	6.65	13.87	20.51	2.37	4.95	7.33
	2018-19	4.95	9.50	14.45	1.77	3.39	5.16
	Total	17.47	35.50	52.97	6.24	12.68	18.92

Source: NIPFP estimations

6.2.3 **BLC component:** In the case of BLC (both new house and enhancement), based on the estimates per house given earlier for both plains and hills, the total direct employment is estimated to be around 20.82 Crore person days (7.43 Lakh jobs), shown in Table 13. Out of which around 13.60 Crore person days (4.86 Lakh jobs) are generated for completed houses and 7.22 Crore (2.58 Lakh jobs) for houses under construction for the entire period. The maximum employment is generated in the year 2017-18.

6.2.4 In BLC, total skilled labour person days generated during the entire period is 5.87 Crore of which 4.03 Crore is generated for completed houses and remaining 1.84 Crore is generated for houses under-construction. The skilled labour person days

comprise of person days for mason and other skilled labours (fitter, blacksmith, painter etc.) which are 4.49 Crore and 1.38 Crore respectively. Similarly, the unskilled person days generated under BLC component is 9.57 Crore for completed houses and 5.38 Crore for under-construction houses.

Table 13: Direct Employment (person days) Generated under BLC (cumulative estimates up to January 31, 2019) <i>(in Crore)</i>			
Employment Category	Completed	Under construction	Total
Skilled	4.03	1.84	5.87
a) Mason (skilled)	3.00	1.49	4.49
b) Fitter, blacksmith, painter, carpenter, etc. (other skilled)	1.03	0.35	1.38
Unskilled	9.57	5.38	14.95
Total Employment	13.60	7.22	20.82
<i>Source: NIPFP estimations</i>			

6.2.5 **AHP component:** The total number of direct employment generated under AHP vertical is 12.65 Crore person days (4.52 Lakh jobs) of which 3.43 Crore person days (1.22 Lakh jobs) is generated by completed houses and 9.22 Crore person days (3.29 Lakh jobs) by under-construction houses. (Table 14)

Table 14: Direct Employment (person days) Generated under AHP (cumulative estimates up to January 31, 2019) <i>(in Crore)</i>			
Employment Category	Completed	Under construction	Total
Skilled	1.28	3.44	4.72
a) Mason (skilled)	0.86	2.32	3.18
b) Fitter, blacksmith, painter, carpenter, etc. (other skilled)	0.42	1.12	1.54
Unskilled	2.15	5.78	7.93
Total Employment	3.43	9.22	12.65
<i>Note</i> Carpet area of each dwelling unit is taken as 30 sq. m. <i>Source: NIPFP estimations</i>			

6.2.6 The categorization of direct employment into skilled and unskilled under AHP component for a dwelling unit of 30 sq. m. (carpet

area) is presented in Table 13. Total skilled labour person days generated during the entire period is 4.72 Crore of which 1.28 Crore is generated for completed houses and remaining 3.44 Crore is generated for houses under-construction. In the total skilled person days, the estimated direct employment for mason and other skilled labours are 3.18 Crore and 1.54 Crore, respectively. Similarly, the unskilled person days generated under AHP component is 2.15 Crore for completed houses and 9.22 Crore for under-construction houses.

6.2.7 ISSR component: The direct employment generated in terms of person days under ISSR vertical is 0.58 Crore person days (0.21 Lakh jobs) of which completed houses have generated 0.05 Crore person days (0.02 Lakh jobs) and under-construction houses have generated 0.53 Crore person days (0.19 Lakh jobs) from June, 2015 up to January, 2019.

6.2.8 The skilled and unskilled employment category under ISSR component (for dwelling unit of 30 sq. m. carpet area) is shown in Table 15. Total skilled labour person days generated during the entire period is 0.22 Crore of which 0.02 Crore is generated for completed houses and remaining 0.20 Crore is generated for houses under-construction. In the total skilled person days, the estimated direct employment for mason and other skilled labours are 0.15 Crore and 0.07 Crore, respectively. Similarly, the unskilled person days generated under ISSR component is 0.03 Crore for completed houses and 0.33 Crore for under-construction houses.

Table 15: Direct Employment (person days) Generated under ISSR (cumulative estimates up to January 31, 2019)			
	<i>(in Crore)</i>		
Employment Category	Completed	Under construction	Total
Skilled	0.02	0.20	0.22
a) Mason (skilled)	0.01	0.13	0.15
b) Fitter, blacksmith, painter, carpenter, etc. (other skilled)	0.01	0.06	0.07
Unskilled	0.03	0.33	0.36
Total Employment	0.05	0.53	0.58
<i>Note</i> Carpet area of each dwelling unit is taken as 30 sq. m. <i>Source:</i> NIPFP estimations			

6.2.9 **CLSS component:** The CLSS vertical has two type of houses: individual houses and Apartments. A total of 18.92 Crore person days (i.e. 6.76 Lakh jobs) direct employment have been generated of which 5.36 Crore person days (i.e. 1.91 Lakh jobs) direct employment are generated by individual houses whereas Apartments have generated 13.57 Crore person days (i.e. 4.85 Lakh jobs) direct employment in the period from June, 2015 up to January, 2019.

6.2.10 Category of skilled and unskilled direct employment under CLSS vertical (30 sq. m. carpet area)⁹ is discussed and shown in Table 16. Total skilled labour person days generated during the entire period is 6.67 Crore of which 1.59 Crore is generated for completed houses and remaining 5.08 Crore is generated for houses under-construction. In the total skilled person days, the estimated direct employment for mason and other skilled labours are 4.61 Crore and 2.06 Crore, respectively. Similarly, the unskilled person days generated under CLSS component is 3.77 Crore for completed houses and 08.49 Crore for under-construction houses.

Table 16: Direct Employment (person days) Generated under CLSS (cumulative estimates up to January 31, 2019)			
<i>(in Crore)</i>			
Employment Category	Individuals	Apartments	Total
Skilled	1.59	5.08	6.67
a) Mason (skilled)	1.19	3.42	4.61
b) Fitter, blacksmith, painter, carpenter, etc. (other skilled)	0.40	1.66	2.06
Unskilled	3.77	8.49	12.26
Total Employment	5.36	13.57	18.92
<i>Note</i> Carpet area of each dwelling unit is taken as 30 sq. m.			
<i>Source:</i> NIPFP estimations			

6.3 **Indirect employment:** This section presents the indirect employment generated due to the PMAY (U) program. As mentioned

⁹ Table 15 showing for dwelling unit with carpet area of 30 sq. m. under CLSS vertical, which is meant for EWS beneficiary. The labour input (person days) required for the subsequent category (LIG, MIG-I, and MIG-II) under this vertical are taken on the pro-rata basis of respective dwelling unit sizes.

above, the indirect employment are estimated through the IO 2013-14 Table using the employment coefficients generated from the NSSO 68th round and the investment (expenditure) made in the program.

6.3.1 As a result of investment made under PMAY(U), the spill-over effects are inevitable as the inter-sector transactions generate indirect employment in the economy, other than construction sector as well. The total indirect employment generated under the PMAY (U) program cumulative for the period from June, 2015 up to January, 2019 is estimated to be 19.20 Crore person days (42.57 Lakh jobs). The detailed break up of indirect employment generated in immediate ancillary sectors and other sectors are presented in Table 17.¹⁰ Out of the total indirect employment generated, the investment in individual type house construction (BLC and individual CLSS) alone generated indirect employment of 40.07 Crore person days (14.31 Lakh jobs), and the investment in Apartment type houses (AHP, ISSR, and Apartment CLSS) generated indirect employment of 79.14 Crore person days (28.26 Lakh jobs).

Table 17: Indirect Employment Generated in Immediate Ancillary Sectors and other Sectors (June 2015 to January 31, 2019)

Sectors	Person days (in Crore)			Jobs (in Lakh)		
	BLC, CLSS (Individual)	AHP, ISSR, CLSS (Apartment)	PMAY(U)	BLC, CLSS (Individual)	AHP, ISSR, CLSS (Apartment)	PMAY(U)
Furniture and fixtures-wooden	0.41	0.81	1.23	0.15	0.29	0.44
Wood and wood products	0.38	0.74	1.12	0.13	0.27	0.40
Paints, varnishes and lacquers	0.04	0.09	0.13	0.02	0.03	0.05
Structural clay products	0.16	0.32	0.48	0.06	0.11	0.17
Cement	0.14	0.28	0.43	0.05	0.10	0.15
Iron, steel and ferro alloys	0.52	1.03	1.55	0.19	0.37	0.55
Iron and steel casting & forging	0.22	0.43	0.65	0.08	0.15	0.23
Hand tools, hardware	0.24	0.48	0.72	0.09	0.17	0.26
Electrical wires & cables	0.07	0.14	0.21	0.02	0.05	0.07
Electronic equipment (incl.TV)	0.09	0.17	0.26	0.03	0.06	0.09
Land transport including via pipeline	0.52	1.03	1.55	0.19	0.37	0.55
Others	37.27	73.61	110.88	13.31	26.29	39.60
Total Indirect Employment	40.07	79.14	119.20	14.31	28.26	42.57

Source: NIPFP estimations.

¹⁰ Vertical level indirect employment that includes employment in immediate sectors is presented in Appendices 10.

6.3.2 **BLC component:** The scheme has generated indirect employment of approximately 29.92 Crore person days (10.68 Lakh jobs) till January 2019 in 4 years. Out of which 21.20 Crore person days (7.57 Lakh jobs) are created through the completed construction and 8.72 Crore person days (3.11 Lakh jobs) through the under-construction houses. The creation of indirect employment was highest in 2017-18 because a higher number of houses were grounded in that year as compared to the other years.

6.3.3 **AHP component:** The scheme has generated indirect employment of approximately 36.72 Crore person days (13.12 Lakh jobs) till January 2019 of which 10.13 Crore person days (3.62 Lakh jobs) are created through the completed construction and 26.60 Crore person days (9.50 Lakh jobs) through the under-construction houses. The creation of indirect employment was highest in 2015-16 because a higher number of houses were grounded in that year as compared to the other years.

6.3.4 **ISSR component:** The ISSR scheme has generated indirect employment of approximately 1.85 Crore person days (0.66 Lakh jobs) till January 2019 over a span of 4 years of which 0.17 Crore person days (0.06 Lakh jobs) are created through the completed construction and 1.68 Crore person days (0.60 Lakh jobs) through the under-construction houses.

6.3.5 **CLSS component:** The total indirect employment generated due to investment under CLSS vertical is 50.17 Crore person days (i.e. 18.11 Lakh jobs) from June, 2015 to January, 2019. Of the total, individual houses have generated 10.15 Crore person days (i.e. 3.62 Lakh jobs) of indirect employment, while the Apartments have generated 40.56 Crore person days (i.e. 14.49 Lakh jobs) indirect employment.

6.4 **Total employment generated due to PMAY (U)- (both direct and indirect)**

6.4.1 **Total direct and indirect employment:** The overall employment generated direct and indirect employment combined under the program for the period from June, 2015 up to January, 2019 is 172.17 Crore person days, which is equivalent to 61.49 Lakh jobs. Out of this, construction of individual type houses (BLC and individual CLSS) alone generated total employment of 66.24 Crore person days (23.66 Lakh jobs), while construction of Apartment type houses (AHP, ISSR, and Apartment CLSS) could have generated employment of 105.94 Crore person days (37.83 Lakh jobs).

6.4.2 The total employment generated at the vertical level is presented in Appendices 12, 13, 14, and 15. While in the case of BLC, AHP and ISSR the estimates includes both completed and under construction houses. In the case of CLSS the estimates consider only new houses that are completed over the period from June, 2015 to January, 2019.

7. **Summary and Conclusions**

7.1.1 In this report, an attempt has been made to understand the impact of PMAY (U) houses on the overall employment generation in the economy. For this, the report tries to estimate employment, both in person days as well as in number of jobs in all the four verticals- BLC, AHP, ISSR and CLSS since June, 2015 up to January, 2019. The report also estimates the direct as well as indirect employment estimation due to increased expenditure under the program. In addition, it tries to estimate employment at the State level as well as the increased demand for construction.¹¹

7.1.2 Based on the physical progress data provided by the Ministry, it is estimated that about Rs. 1,11,851.16 Crore has been spent under the program, which should have a significant impact on

¹¹ State level estimates (direct employment) and increased demand for construction materials are presented in Appendices 16 and 17, respectively.

employment generation not only in the construction sector but also in other sectors in the economy. The total number of employment generated under all four verticals are 172.17 Crore person days of which direct employment is 52.97 Crore person days and indirect employment is 119.20 Crore person days.

7.1.3 In terms of number of jobs, the program would have generated about 61.49 Lakh jobs under all four verticals. Out of this the direct jobs estimated is about 18.92 Lakh jobs, while 42.57 Lakh jobs are through indirect effects. The maximum employment is generated by the BLC vertical.

7.1.4 It should be noted that the estimated number of direct employment is exclusively an outcome of investment made under PMAY (U) to construct houses. As a matter of fact, any investment made in one sector creates indirect jobs in 130 sectors of the economy, as an induced effect. Therefore, overall employment generation due to PMAY (U) would include both direct and indirect employment. However, the indirect employment generation by one sector of the economy is direct employment for other sector. Thus, while estimating employment generation at national level including all sectors, only direct employment should be considered to avoid duplication.

7.1.5 To sum up, the current analysis reveals that the PMAY (U) program has made a significant impact on employment generation in the economy. However, the analysis done in the report has its limitations. The cost and labour estimates are done on the basis of DPRs for BLC, which are only suggestive in nature. Similarly, in the case of AHP and ISSR, the designs, considered for analysis, use only conventional methods for construction. Thus, any changes to those assumptions may alter the findings. In the next report, we look at the overall implementation issues at the ground level based on field visits to the states as suggested by the Ministry.

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APPENDIX 1										
State-wise Physical and Financial Progress under PMAY (U)										
As on 31 st January 2019										
Sl. No.	Name of the State/ UT	Project Proposal Considered	Physical Progress (Nos)				Financial Progress (Rs in crore)			
			Houses sanctioned (in No.s)	Percent of houses grounded/sanctioned	Percent of houses completed / grounded	Percent of houses occupied/sanctioned	Investment proposal (Rs. in crore)	Percent of Central Assistance involved in investment	Percent of Central Assistance Released to involved	
1	Andhra Pradesh	554	1129530	61	24	8	59168	29	23	
2	Bihar	361	242294	39	14	5	12155	31	26	
3	Chhattisgarh	1139	211267	38	23	8	8820	36	33	
4	Goa	10	381	85	100	84	69	12	93	
5	Gujarat	593	421813	73	52	32	35062	20	57	
6	Haryana	638	251126	10	34	3	23998	17	13	
7	Himachal Pradesh	101	8428	35	24	8	430	35	40	
8	Jammu & Kashmir	209	34451	31	6	2	1842	29	20	
9	Jharkhand	330	163503	62	40	25	10463	23	41	
10	Karnataka	1687	519583	46	44	18	28468	29	32	
11	Kerala	418	114734	52	26	14	4107	43	53	
12	Madhya Pradesh	1235	647017	60	37	20	35390	28	49	
13	Maharashtra	551	792658	19	67	13	60624	19	27	
14	Orissa	495	133175	49	36	16	4796	43	34	
15	Punjab	548	52365	48	24	11	2030	38	36	
16	Rajasthan	315	166295	38	51	16	9483	28	28	
17	Tamil Nadu	2434	605515	64	25	15	29406	31	31	
18	Telangana	246	200607	74	22	6	16072	19	46	
19	Uttar Pradesh	2491	959257	34	30	10	40982	36	21	
20	Uttarakhand	145	32202	36	42	15	2053	28	47	
21	West Bengal	361	341640	45	45	21	14799	35	36	
Sub-total (States)		14,861	70,27,841	47	34	14	4,00,215	27	32	

Appendix 1 (cont.): State-wise physical and financial progress under PMAY (U)
As on 31st January 2019

Sl. No.	Name of the State/ UT	Project Proposal Considered	Physical Progress (Nos)				Financial Progress (Rs in crore)			
			Houses sanctioned (in No.s)	Percent of houses grounded/ sanctioned	Percent of houses completed / grounded	Percent of houses occupied/ sanctioned	Investment proposal (Rs. in crore)	Percent of Central Assistance involved in investment	Percent of Central Assistance Released to involved	
22	Arunachal Pradesh	31	6284	84	10	9	358	42	59	
23	Assam	167	57572	52	1	1	1786	48	40	
24	Manipur	26	29081	40	5	2	747	58	37	
25	Meghalaya	8	805	54	26	14	35	35	46	
26	Mizoram	32	29865	6	34	2	619	74	18	
27	Nagaland	35	25764	25	7	0	681	61	36	
28	Sikkim	11	518	56	7	4	14	57	38	
29	Tripura	63	80011	80	28	23	2200	56	50	
	Sub- total (NE States)	373	229900	52	17	9	6440	55	41	
30	A&N Island (UT)	3	611	6	23	1	54	17	3	
31	Chandigarh (UT)	-	145	100	100	100	35	10	100	
32	D&N Haveli (UT)	3	4073	57	41	23	220	31	55	
33	Daman & Diu (UT)	6	819	73	43	32	40	34	49	
34	Delhi (UT)	-	7889	100	100	100	1478	12	100	
35	Puducherry (UT)	17	9573	37	8	3	428	34	42	
	Sub- total (UT)	29	23110	63	65	41	2255	19	68	
	Grand Total	15,263	72,80,851	48	34	14	4,08,911	27	32	

Note: Including RAY, CLSS, ISSR, AHP, and BLC components

Source: Compiled from data provided by MoHUA, 2019.

APPENDIX 2
Labour (person days) Input for Construction of
Dwelling Unit under BLC for 25.33 sqm in Plain Areas

Stages of Construction	Name of work	Skilled	Unskilled	Total
Foundation + plinth		14.33	41.08	55.41
	Earth work in excavation	0.00	2.04	2.04
	Filling foundation with gravel	0.00	2.62	2.62
	Filling foundation with sand	0.00	0.61	0.61
	Making Cement concrete	0.55	12.80	13.35
	Brick Work	13.78	23.01	36.79
Lintel (RCC and brick work)		13.96	46.47	60.43
	Brick work	13.96	46.47	60.43
Roof		9.51	26.46	35.97
	Supplying, erecting and centering	4.97	9.93	14.90
	RCC	0.87	12.01	12.88
	Weathering course	0.30	1.14	1.44
	Supplying, fabricating and placing mild steel	3.38	3.38	6.75
Finishing		34.78	58.08	92.86
	Plastering	13.63	33.98	47.62
	Flooring	7.56	8.21	15.76
	Supply of steel door, steel window, precast jolly	2.67	2.11	4.77
	Supplying and fixing PVC door	0.17	0.17	0.34
	Painting walls and iron works	4.81	8.36	13.17
	Supplying and fixing IWC water closet, rain water pipe and waste water pipe	1.97	1.18	3.15
	Electrification, fittings and wiring	3.87	3.87	7.75
	Contingencies	0.10	0.20	0.30
Total		72.57	172.09	244.66

Note: Labour inputs are estimated from Analysis of Rates (AOR) based on Central Public Work Department (CPWD), Government of India, 2016
Source: Estimated from DPRs of Tamil Nadu (for Plains)

APPENDIX 3				
Labour (person days) Input for Construction of Dwelling Unit under BLC for 25.33 sqm in Hilly areas				
Stages of construction	Name of work	Skilled	Unskilled	Total
Foundation + plinth		21.70	63.23	84.93
	Earth work in excavation	0.00	5.52	5.52
	Filling excavated land	0.00	1.90	1.90
	Providing and laying Cement concrete	0.25	5.81	6.06
	Providing and laying RCC	1.21	20.53	21.73
	Columns, Pillars, Piers, Abutments, Posts and Struts	6.91	13.82	20.73
	Steel reinforcement in RCC	10.25	10.25	20.49
	Random Rubble masonry	3.09	5.40	8.49
Lintel (RCC and brick work)		13.82	52.17	65.99
	RCC in walls	1.64	22.43	24.06
	Putting beams, girders, bressumers and cantilevers	3.39	6.79	10.18
	Brick work	8.79	22.96	31.74
Roof		12.99	34.80	47.79
	Centering and shuttering	8.67	17.35	26.02
	RCC	4.31	17.46	21.77
Finishing		41.20	75.78	116.98
	Structural steel work	1.69	1.35	3.03
	Cement Plaster	13.90	34.65	48.55
	Cement Concrete flooring	3.03	9.24	12.27
	Providing and fixing doors, windows and clerestory windows	4.69	3.10	7.78
	White washing with lime	0.00	3.74	3.74
	Water proofing walls	3.82	2.74	6.55
	Painting walls	1.33	0.78	2.11
	Construction septic tank and soak pit	3.50	12.96	16.46
	Providing and fixing water supply pipes and sanitary wares	3.94	1.93	5.87
	Internal electrification	5.29	5.29	10.60
Total		89.71	225.99	315.70
<i>Note:</i> Labour inputs are estimated from Analysis of Rates (AOR) based on Central Public Work Department (CPWD), Government of India, 2016				
<i>Source:</i> Estimated from DPRs of Uttarakhand (for Hills)				

APPENDIX 4											
Person Days required under BLC											
State (Sample Nos)	Not completed houses	Average area of house (sq. m.)	Average number of person days			Average number of person days (for 25.33 sq. m.)			Person days for construction of a house (per sq. m.)		
			Skilled	Unskilled	Total	Skilled	Unskilled	Total	Skilled	Unskilled	Total
Tamil Nadu (10)	20.00	43.56	133.20	276.80	410.00	77.5	160.9	238.4	3.06	6.35	9.41
Andhra Pradesh (11)	18.18	62.12	295.73	502.45	798.18	120.6	204.9	325.5	4.76	8.09	12.85
Gujarat (17)	5.88	49.00	296.00	464.00	760.00	153.0	239.9	392.9	6.04	9.47	15.51
Jharkhand (6)	33.33	49.00	133.00	264.00	397.00	68.8	136.5	205.2	2.71	5.39	8.10
Madhya Pradesh (8)	62.50	48.00	178.00	351.00	529.00	93.9	185.2	279.2	3.71	7.31	11.02
Uttar Pradesh (8)	25.00	37.00	76.00	164.00	240.00	52.0	112.3	164.3	2.05	4.43	6.49
Uttarakhand (10)	50.00	42.87	151.60	360.70	512.30	89.6	213.1	302.7	3.54	8.41	11.95
Total (70)	30.70	47.36	180.50	340.42	520.93	96.5	182.1	278.6	3.81	7.19	11.00
Uttarakhand (DPR)		21.83	77.31	194.76	272.08	89.71	225.99	315.70	2.78	7.00	9.78
Uttarakhand (10)		21.83	77.20	183.67	260.86	89.57	213.12	302.69	3.54	8.41	11.95
Tamil Nadu (DPR)		22.50	67.09	163.03	230.12	75.52	183.54	259.06	2.37	5.77	8.15
Tamil Nadu (10)		22.50	68.80	142.97	211.77	77.45	160.95	238.40	3.06	6.35	9.41

Note: The States are as suggested by the Ministry.

Source: Based on telephonic interviews

APPENDIX 5
Expenditure Profile on the Urban Housing Program (3 Components)
Financial Progress at 2011-12 Constant Prices (in Crore)*

Year	BLC			AHP			ISSR		
	Completed	Under-construction	Total	Completed	Under-construction	Total	Completed	Under-construction	Total
2015-16	3,401.07	321.67	3,722.74	6,435.97	5,560.75	11,996.72	131.91	1,096.51	1228.42
2016-17	5,632.04	2,185.94	7,817.99	303.39	3,971.67	4,275.07	0.00	163.82	163.82
2017-18	6,876.08	3,626.75	10,502.84	985.61	10,743.01	11,728.63	0.00	49.63	49.63
2018-19	514.27	566.96	1,081.23	154.31	420.09	574.40	0.00	0.00	0.00
Total	16,423.48	6,701.33	23,124.81	7,879.29	20,695.52	28,574.81	131.91	1,309.96	1,441.87

Note: *Exclusively for IO Table

Source: Estimated from the physical progress report as on 31st January, 2019

APPENDIX 6
Total Expenditure on the Urban Housing Program (3 Components)
(in Crore)

Year	At 2011-12 Current Prices			At 2011-12 Constant Prices		
	Completed	Under-construction	Total	Completed	Under-construction	Total
2015-16	11403.71	7983.36	19387.08	9968.95	6978.93	16947.88
2016-17	6963.00	7414.12	14377.12	5945.07	6330.23	12275.30
2017-18	9512.84	17437.17	26950.02	7893.61	14469.10	22362.70
2018-19	881.24	1279.74	2160.98	697.02	1012.21	1709.23
Total	28760.80	34114.39	62875.19	24504.65	28790.47	53295.11

Source: Estimated from the physical progress report as on 31st January, 2019

APPENDIX 7

Total Expenditure on the Urban Housing Program

(in Crore)

Scheme	Year	At 2011-12 Current price	At 2011-12 Constant price
BLC, and CLSS (Individual)	2015-16	4331.19	3786.26
	2016-17	9801.90	8368.95
	2017-18	15519.30	12877.68
	2018-19	7765.19	6141.87
	Total	37417.59	31174.76
AHP, ISSR, and CLSS (Apartment)	2015-16	15296.01	13371.53
	2016-17	6754.12	5766.72
	2017-18	25901.12	21492.35
	2018-19	26482.33	20946.20
	Total	74433.58	61576.80
Grand Total, PMAY (U)	2015-16	19627.20	17157.79
	2016-17	16556.02	14135.66
	2017-18	41420.42	34370.02
	2018-19	34247.52	27088.07
	Total	111851.16	92751.56

Note: 1. Current price includes actual expenditure for BLC, AHP, ISSR and CLSS
2. Expenditure of CLSS component is based on the loan amount only.

Source: Estimated from the physical progress report as on 31st January, 2019

APPENDIX 8

Employment Definition by NSSO 68th Round

Code	Description
<i>Self-employed</i>	
11	Worked in household enterprises (self-employed) as own-account worker
21	Worked in household enterprises (self-employed) as an employer
31	Worked in household enterprises (self-employed) as helper
<i>Regular wage/salaried employee</i>	
31	Worked as regular wage/salaried employee
<i>Casual labour</i>	
41	Worked as casual labour in public works other than MGNREG public works
42	Worked as casual labour in Mahatma Gandhi NREG public works
51	Worked as casual labour in other types of works

Source: NSSO, 2014

APPENDIX 9 Estimated Employment Multipliers

Sl. No.	Sector	Singh & Saluja (2016)	Principal + Subsidiary (ps+ss)	Principal status (ps)	Sl. No.	Sector	Singh & Saluja (2016)	Principal + Subsidiary (ps+ss)	Principal status (ps)
1	Paddy	3.07	3.71	2.80	34	Other metallic minerals	0.11	0.12	0.10
2	Wheat	3.68	4.26	3.27	35	Lime stone	0.36	0.39	0.29
3	Jowar	2.34	4.21	1.71	36	Mica	0.38	0.20	0.17
4	Bajra	1.56	1.68	1.67	37	Other non-metallic minerals	0.24	0.24	0.21
5	Maize	1.93	1.71	1.69	38	Sugar	1.00	1.02	0.87
6	Gram	0.54	0.66	0.39	39	Khandsari, boora	0.95	0.98	0.83
7	Pulses	0.58	0.56	0.50	40	Hydrogenated oil(vanaspati)	0.65	0.70	0.56
8	Sugarcane	1.21	1.28	1.08	41	Edible oils other than vanaspati	0.81	0.86	0.69
9	Groundnut	1.12	1.13	0.94	42	Tea and coffee processing	0.12	0.11	0.10
10	Coconut	1.12	1.43	1.07	43	Miscellaneous food products	1.63	1.87	1.45
11	Other oilseeds	0.92	1.01	0.82	44	Beverages	0.40	0.43	0.35
12	Jute	1.10	0.96	0.91	45	Tobacco products	1.08	1.14	0.84
13	Cotton	1.81	1.74	1.50	46	Khadi, cotton textiles (handlooms)	0.84	0.54	0.44
14	Tea	1.96	1.47	1.42	47	Cotton textiles	0.64	0.57	0.49
15	Coffee	1.02	0.93	0.83	48	Woollen textiles	0.39	0.38	0.28
16	Rubber	0.58	0.89	0.62	49	Silk textiles	0.44	0.37	0.32
17	Tobacco	1.13	1.31	1.08	50	Art silk, synthetic fiber textiles	0.41	0.40	0.35
18	Fruits	0.13	0.13	0.11	51	Jute, hemp, mesta textiles	0.90	0.60	0.55
19	Vegetables	0.38	0.42	0.32	52	Carpet weaving	0.80	0.78	0.65
20	Other crops	1.21	1.16	0.90	53	Readymade garments	0.98	0.83	0.70
21	Milk and milk products	0.38	0.52	0.30	54	Miscellaneous textile products	1.17	0.96	0.77
22	Animal services(agricultural)	0.36	1.06	0.63	55	Furniture and fixtures-wooden	0.54	0.26	0.22
23	Poultry & Eggs	0.56	0.68	0.51	56	Wood and wood products	0.64	0.39	0.32
24	Other livestock production	0.70	0.73	0.48	57	Paper, paper prods., newsprint	0.28	0.25	0.21
25	Forestry and logging	0.07	0.11	0.06	58	Printing and publishing	0.36	0.31	0.28
26	Fishing	0.23	0.20	0.17	59	Leather footwear	0.81	0.70	0.55
27	Coal and lignite	0.20	0.17	0.15	60	Leather and leather products	0.41	0.40	0.31
28	Natural gas	0.21	0.15	0.13	61	Rubber products	0.29	0.30	0.24
29	Crude petroleum	0.12	0.11	0.09	62	Plastic products	0.28	0.26	0.22
30	Iron ore	0.13	0.13	0.12	63	Petroleum products	0.12	0.11	0.09
31	Manganese ore	0.28	0.24	0.21	64	Coal tar products	0.15	0.15	0.13
32	Bauxite	0.13	0.18	0.16	65	Inorganic heavy chemicals	0.18	0.19	0.15
33	Copper ore	0.28	0.25	0.23					

Sl. No.	Sector	Singh & Saluja (2016)	Principal + Subsidiary (ps+ss)	Principal status (ps)	Sl. No.	Sector	Singh & Saluja (2016)	Principal + Subsidiary (ps+ss)	Principal status (ps)
66	Organic heavy chemicals	0.16	0.16		99	Bicycles, cycle-rickshaw	0.78	0.22	0.19
67	Fertilizers	0.18	0.20		100	Other transport equipment	0.24	0.25	0.23
68	Pesticides	0.14	0.14		101	Watches and clocks	0.63	0.22	0.21
69	Paints, varnishes and lacquers	0.17	0.16		102	Medical, precision & optical instruments	0.23	0.19	0.16
70	Drugs and medicines	0.22	0.21		103	Gems & jewellery	0.51	0.42	0.38
71	Soaps, cosmetics & glycerine	0.31	0.31		104	Aircraft & spacecraft	0.34	0.28	0.26
72	Synthetic fibers, resin	0.35	0.32		105	Miscellaneous manufacturing	0.23	0.26	0.22
73	Other chemicals	0.30	0.28		106	Construction	0.37	0.41	0.29
74	Structural clay products	0.67	0.19		107	Electricity	0.23	0.23	0.20
75	Cement	0.16	0.15		108	Water supply	0.19	0.19	0.15
76	Other non-metallic mineral prods.	0.42	0.63		109	Railway transport services	0.23	0.16	0.15
77	Iron, steel and ferro alloys	0.19	0.20		110	Land transport including via pipeline	0.35	0.30	0.27
78	Iron and steel casting & forging	0.26	0.22		111	Water transport	0.24	0.23	0.20
79	Iron and steel foundries	0.19	0.16		112	Air transport	0.18	0.17	0.14
80	Non-ferrous basic metals	0.17	0.16		113	Supporting and auxiliary transport activities	0.22	0.34	0.29
81	Hand tools, hardware	0.34	0.27		114	Storage and warehousing	0.30	0.29	0.27
82	Miscellaneous metal products	0.28	0.25		115	Communication	0.21	0.20	0.17
83	Tractors and agri. implements	0.28	0.21		116	Trade	0.44	0.34	0.31
84	Industrial machinery(F & T)	0.35	0.26		117	Hotels and restaurants	0.63	0.62	0.52
85	Industrial machinery(others)	0.30	0.21		118	Banking	0.11	0.09	0.08
86	Machine tools	0.26	0.20		119	Insurance	0.23	0.17	0.15
87	Other non-electrical machinery	0.23	0.17		120	Ownership of dwellings	0.01	0.02	0.02
88	Electrical industrial Machinery	0.26	0.19		121	Education and research	0.43	0.35	0.32
89	Electrical wires & cables	0.21	0.23		122	Medical and health	0.29	0.24	0.22
90	Batteries	0.24	0.20		123	Business services	0.27	0.23	0.21
91	Electrical appliances	0.49	0.29		124	Computer & related activities	0.15	0.11	0.10
92	Communication equipments	0.33	0.16		125	Legal services	0.42	0.22	0.19
93	Other electrical Machinery	0.46	0.43		126	Real estate activities	0.19	0.15	0.13
94	Electronic equipments(incl.TV)	0.29	0.15		127	Renting of machinery & equipment	0.38	0.12	0.10
95	Ships and boats	0.28	0.23		128	Community, social, & personal services	0.58	0.14	0.11
96	Rail equipments	0.43	0.34		129	Other services	0.26	0.93	0.82
97	Motor vehicles	0.23	0.16		130	Public administration	0.25	0.25	0.21
98	Motor cycles and scooters	0.31	0.19						

Note: For Employment Status, the two definitions (Usual Principal and Subsidiary Activities) are adopted from NSSO 68th Round, 2011-12.

APPENDIX 10												
Indirect Employment Generated in Immediate Ancillary Sectors and other Sectors, Vertical-wise Cumulative from June 2015 upto January 31, 2019												
Sectors	Person days (in Crore)						Jobs (in Lakh)					
	BLC	AHP	ISSR	CLSS	PMAY (U)	BLC	AHP	ISSR	CLSS	PMAY (U)		
Furniture and fixtures-wooden	0.31	0.38	0.02	0.52	1.23	0.11	0.13	0.01	0.19	0.44		
Wood and wood products	0.28	0.34	0.02	0.48	1.12	0.10	0.12	0.01	0.17	0.40		
Paints, varnishes and lacquers	0.03	0.04	0.00	0.05	0.13	0.01	0.01	0.00	0.02	0.05		
Structural clay products	0.12	0.15	0.01	0.20	0.48	0.04	0.05	0.00	0.07	0.17		
Cement	0.11	0.13	0.01	0.18	0.43	0.04	0.05	0.00	0.07	0.15		
Iron, steel and ferro alloys	0.39	0.48	0.02	0.66	1.55	0.14	0.17	0.01	0.24	0.55		
Iron and steel casting & forging	0.16	0.20	0.01	0.28	0.65	0.06	0.07	0.00	0.10	0.23		
Hand tools, hardware	0.18	0.22	0.01	0.30	0.72	0.06	0.08	0.00	0.11	0.26		
Electrical wires & cables	0.05	0.06	0.00	0.09	0.21	0.02	0.02	0.00	0.03	0.07		
Electronic equipment (incl.TV)	0.07	0.08	0.00	0.11	0.26	0.02	0.03	0.00	0.04	0.09		
Land transport including via pipeline	0.39	0.48	0.02	0.66	1.55	0.14	0.17	0.01	0.24	0.55		
Others	27.83	34.16	1.72	47.17	110.88	9.94	12.20	0.62	16.85	39.60		
Total Indirect Employment	29.92	36.72	1.85	50.71	119.20	10.68	13.12	0.66	18.11	42.57		
<i>Source: NIPFP estimations.</i>												

APPENDIX 11									
Employment Generated Cumulative from June 2015 up to January 31, 2019									
Scheme	Year	Person days (in Crore)			Jobs (in Lakh)				
		Direct	Indirect	Total	Direct	Indirect	Total		
BLC, and CLSS (Individual)	2015-16	3.00	4.87	7.86	1.07	1.74	2.81		
	2016-17	6.84	10.76	17.59	2.44	3.84	6.28		
	2017-18	11.10	16.55	27.65	3.96	5.91	9.87		
	2018-19	5.24	7.89	13.14	1.87	2.82	4.69		
	Total	26.17	40.07	66.24	9.35	14.31	23.66		
AHP, ISSR, and CLSS (Apartment)	2015-16	5.73	17.19	22.91	2.04	6.14	8.18		
	2016-17	2.45	7.41	9.86	0.88	2.65	3.52		
	2017-18	9.42	27.62	37.04	3.36	9.86	13.23		
	2018-19	9.20	26.92	36.12	3.29	9.61	12.90		
	Total	26.80	79.14	105.94	9.57	28.26	37.83		
PMAY (U), Grand Total	2015-16	8.72	22.05	30.77	3.12	7.88	10.99		
	2016-17	9.29	18.17	27.46	3.32	6.49	9.81		
	2017-18	20.51	44.17	64.69	7.33	15.78	23.10		
	2018-19	14.45	34.81	49.26	5.16	12.43	17.59		
	Total	2.97	119.20	172.17	18.92	42.57	61.49		

Source: NIPFP estimations.

APPENDIX 12 Employment (person days) generated year-wise from June 2015 up to January 31, 2019 Numbers in Crore												
Scheme	Year	Direct			Indirect			Total				
		Completed	Under Construction	Total	Completed	Under Construction	Total	Completed	Under Construction	Total		
BLC	2015-16	2.70	0.26	2.96	4.37	0.41	4.78	7.07	0.67	7.74		
	2016-17	4.64	1.86	6.51	7.25	2.82	10.07	11.90	4.68	16.58		
	2017-18	5.78	3.88	9.65	8.88	4.72	13.60	14.66	8.60	23.26		
	2018-19	0.47	1.22	1.70	0.70	0.76	1.46	1.17	1.98	3.15		
Sub Total		13.60	7.22	20.82	21.20	8.72	29.92	34.79	15.94	50.73		
AHP	2015-16	2.77	2.40	5.17	8.27	7.15	15.42	11.04	9.54	20.59		
	2016-17	0.13	1.75	1.89	0.39	5.10	5.49	0.52	6.86	7.38		
	2017-18	0.45	4.88	5.32	1.27	13.81	15.07	1.71	18.68	20.40		
	2018-19	0.07	0.20	0.27	0.20	0.54	0.74	0.27	0.74	1.01		
Sub Total		3.43	9.22	12.65	10.13	26.60	36.72	13.55	35.82	49.37		
ISSR	2015-16	0.05	0.44	0.49	0.17	1.41	1.58	0.22	1.85	2.07		
	2016-17	0.00	0.07	0.07	0.00	0.21	0.21	0.00	0.28	0.28		
	2017-18	0.00	0.02	0.02	0.00	0.06	0.06	0.00	0.08	0.08		
	2018-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Sub Total		0.05	0.53	0.58	0.17	1.68	1.85	0.22	2.21	2.43		
TOTAL	2015-16	5.53	3.09	8.62	12.81	8.97	21.78	18.34	12.06	30.40		
	2016-17	4.78	3.68	8.46	7.64	8.14	15.78	12.42	11.82	24.24		
	2017-18	6.22	8.77	15.00	10.14	18.60	28.74	16.37	27.37	43.74		
	2018-19	0.55	1.42	1.97	0.90	1.30	2.20	1.44	2.72	4.17		
BLC, AHP, and ISSR Total		17.08	16.97	34.05	31.49	37.00	68.49	48.57	53.97	102.54		

Source: NIPFP estimations.

APPENDIX 13 Number of Person getting Jobs for 280 days in each year up to January 31, 2019 Number in Lakh											
Scheme	Year	Direct			Indirect			Total			
		Completed	Under Construction	Total	Completed	Under Construction	Total	Completed	Under Construction	Total	
BLC	2015-16	0.96	0.09	1.06	1.56	0.15	1.71	2.53	0.24	2.77	
	2016-17	1.66	0.67	2.32	2.59	1.01	3.60	4.25	1.67	5.92	
	2017-18	2.06	1.38	3.45	3.17	1.69	4.86	5.23	3.07	8.31	
	2018-19	0.17	0.44	0.61	0.25	0.27	0.52	0.42	0.71	1.13	
Sub Total		4.86	2.58	7.43	7.57	3.11	10.68	12.43	5.69	18.12	
AHP	2015-16	0.99	0.86	1.85	2.95	2.55	5.51	3.94	3.41	7.35	
	2016-17	0.05	0.63	0.67	0.14	1.82	1.96	0.19	2.45	2.64	
	2017-18	0.16	1.74	1.90	0.45	4.93	5.38	0.61	6.67	7.28	
	2018-19	0.03	0.07	0.10	0.07	0.19	0.26	0.10	0.26	0.36	
Sub Total		1.22	3.29	4.52	3.62	9.50	13.12	4.84	12.79	17.63	
ISSR	2015-16	0.02	0.16	0.18	0.06	0.50	0.56	0.08	0.66	0.74	
	2016-17	0.00	0.02	0.02	0.00	0.08	0.08	0.00	0.10	0.10	
	2017-18	0.00	0.01	0.01	0.00	0.02	0.02	0.00	0.03	0.03	
	2018-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Sub Total		0.02	0.19	0.21	0.06	0.60	0.66	0.08	0.79	0.87	
TOTAL	2015-16	1.97	1.10	3.08	4.58	3.20	7.78	6.55	4.31	10.86	
	2016-17	1.71	1.32	3.02	2.73	2.91	5.63	4.44	4.22	8.66	
	2017-18	2.22	3.13	5.36	3.62	6.64	10.26	5.85	9.77	15.62	
	2018-19	0.20	0.51	0.70	0.32	0.46	0.78	0.52	0.97	1.49	
BLC, AHP, and ISSR Total		6.10	6.06	12.16	11.25	13.21	24.46	17.35	19.28	36.62	

Source: NIPFP estimations.

APPENDIX 14

Employment (person days) Generated Year-wise under CLSS from June 2015 up to January 31, 2019

Year	Direct			Indirect			Total		
	Individual	Apartment	Total	Individual	Apartment	Total	Individual	Apartment	Total
2015-16	0.04	0.06	0.10	0.08	0.19	0.27	0.12	0.25	0.37
2016-17	0.33	0.50	0.83	0.68	1.71	2.39	1.01	2.21	3.22
2017-18	1.44	4.07	5.52	2.95	12.48	15.43	4.39	16.56	20.95
2018-19	3.55	8.93	12.48	6.44	26.18	32.62	9.98	35.11	45.09
Total	5.36	13.57	18.92	10.15	40.56	50.71	15.50	54.13	69.63

Note: This includes only new houses under CLSS (EWS, LIG, MIG-I, MIG-II); and assumed completed constructions.

Source: NIPFP estimations.

APPENDIX 15

Number of Jobs (for 280 days in each year) under CLSS up to January 31, 2019

Year	Direct			Indirect			Total		
	Individual	Apartment	Total	Individual	Apartment	Total	Individual	Apartment	Total
2015-16	0.01	0.02	0.04	0.03	0.07	0.10	0.04	0.09	0.13
2016-17	0.12	0.18	0.30	0.24	0.61	0.85	0.36	0.79	1.15
2017-18	0.52	1.46	1.97	1.05	4.46	5.51	1.57	5.91	7.48
2018-19	1.27	3.19	4.46	2.30	9.35	11.65	3.56	12.54	16.10
Total	1.91	4.85	6.76	3.62	14.49	18.11	5.54	19.33	24.87

Note: This includes only new houses under CLSS (EWS, LIG, MIG-I, MIG-II)

Source: NIPFP estimations.

APPENDIX 16
State Level Direct Employment Generated under PMAY (U)

States/UTs	Person days (in Crore)			Jobs (in Lakh)		
	BLC, CLSS (Individual)	AHP, ISSR, CLSS (Apartments)	PMAY (U)	BLC, CLSS (Individual)	AHP, ISSR, CLSS (Apartments)	PMAY (U)
Andhra Pradesh	2.84	5.86	8.70	1.01	2.09	3.11
Bihar	0.72	0.06	0.78	0.26	0.02	0.28
Chhattisgarh	0.65	0.34	0.99	0.23	0.12	0.35
Goa	0.00	0.02	0.02	0.00	0.01	0.01
Gujarat	1.63	4.74	6.37	0.58	1.69	2.27
Haryana	0.19	0.32	0.51	0.07	0.11	0.18
Himachal Pradesh	0.03	0.01	0.04	0.01	0.00	0.01
Jammu & Kashmir	0.08	0.00	0.08	0.03	0.00	0.03
Jharkhand	1.23	0.08	1.32	0.44	0.03	0.47
Karnataka	2.13	2.09	4.21	0.76	0.74	1.50
Kerala	0.64	0.03	0.67	0.23	0.01	0.24
Madhya Pradesh	4.07	1.70	5.77	1.45	0.61	2.06
Maharashtra	0.46	5.00	5.46	0.16	1.79	1.95
Orissa	0.63	0.13	0.77	0.23	0.05	0.27
Punjab	0.22	0.15	0.37	0.08	0.05	0.13
Rajasthan	0.25	0.84	1.09	0.09	0.30	0.39
Tamil Nadu	3.52	1.12	4.64	1.26	0.40	1.66
Telangana	0.18	2.22	2.41	0.07	0.79	0.86
Uttar Pradesh	3.04	1.13	4.17	1.09	0.40	1.49
Uttarakhand	0.24	0.04	0.27	0.08	0.01	0.10
West Bengal	2.00	0.50	2.50	0.71	0.18	0.89
Sub-total (States)	24.74	26.39	51.13	8.84	9.42	18.26

APPENDIX 16 (contd.): State Level Direct Employment Generated under PMAY (U)

States/UTs	Person days (in Crore)			Jobs (in Lakh)		
	BLC, CLSS (Individual)	AHP, ISSR, CLSS (Apartment)	PMAY (U)	BLC, CLSS (Individual)	AHP, ISSR, CLSS (Apartment)	PMAY (U)
Arunachal Pradesh	0.04	0.00	0.04	0.01	0.00	0.01
Assam	0.27	0.01	0.28	0.10	0.01	0.10
Manipur	0.11	0.00	0.11	0.04	0.00	0.04
Meghalaya	0.01	-	0.01	0.00	-	0.00
Mizoram	0.03	0.00	0.03	0.01	0.00	0.01
Nagaland	0.03	-	0.03	0.01	-	0.01
Sikkim	0.00	-	0.00	0.00	-	0.00
Tripura	0.85	0.00	0.85	0.30	0.00	0.31
Sub-total (NE)	1.34	0.02	1.35	0.48	0.01	0.48
A&N Island	0.00	-	0.00	0.00	-	0.00
Chandigarh	0.00	0.00	0.00	0.00	0.00	0.00
D&N Haveli	0.00	0.03	0.04	0.00	0.01	0.01
Daman & Diu	0.00	0.01	0.01	0.00	0.00	0.00
Delhi	0.05	0.35	0.40	0.02	0.12	0.14
Lakshadweep	-	-	-	-	-	-
Puducherry	0.03	0.00	0.04	0.01	0.00	0.01
Sub-total (UTs)	0.09	0.40	0.49	0.03	0.14	0.17
Grand Total	26.17	26.80	52.97	9.35	9.57	18.92

Source: NIPFP estimations

APPENDIX 17

**Increased Demand for the Construction Materials under PMAY(U) - (BLC, AHP, and ISSR)
(Cumulative from June 2015 up to January 31, 2019)**

Materials	Unit	Completed	Under construction	Grand Total	Increased Demand (Rs. in Crore)
PMAY (U) Expenditure					
Material Cost	Rs. in Crore	28,760.80	34,114.39	62,875.19	62,875.19
Bricks	Rs. in Crore	21,255.86	26,747.27	48,003.13	48,003.13
Cement	Crore Piece	802.14	452.68	1,254.81	10,875.40
Sand	Crore Bag	12.45	20.13	32.58	10,290.90
Stone (aggregate)	Lakh Cum	162.74	242.45	405.19	3,729.57
Steel	Lakh Cum	138.42	217.25	355.67	4,508.22
Hard stone	Lakh Quintal	101.38	143.68	245.05	10,036.48
White lime	Cum	0.01	0.00	0.01	8.24
Putty	Kg	1.13	3.01	4.14	49.63
Distemper primer	Lakh Quintal	33.33	13.46	46.80	80.96
Cement Primer of Interior Grade- 1	Crore Litre	1.60	1.67	3.27	222.11
Epoxy paint	Lakh Quintal	0.19	0.53	0.72	101.72
Red oxide zinc chromite primer	Crore Litre	1.88	0.76	2.64	634.16
Water proofing cement paint	Crore Litre	0.12	0.05	0.16	20.61
Multi surface paint	Rs. in Crore				4.72
Special Primer (C.W.)	Rs. in Crore				1.68
Tiles	Sq. m	1.18	3.32	4.50	0.66
Electricity/wiring materials (LS)	Rs. in Crore				1,452.60
Other sanitary wares (LS)	Rs. in Crore				1,082.15
Door and window (Steel)	Rs. in Crore				1,298.58
Miscellaneous	Rs. in Crore				2,370.40
<i>Source: NIPFP estimation</i>					

