Niti Ayog Report of Sub-group on agriculture sector for energy data management issues.

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REPORT

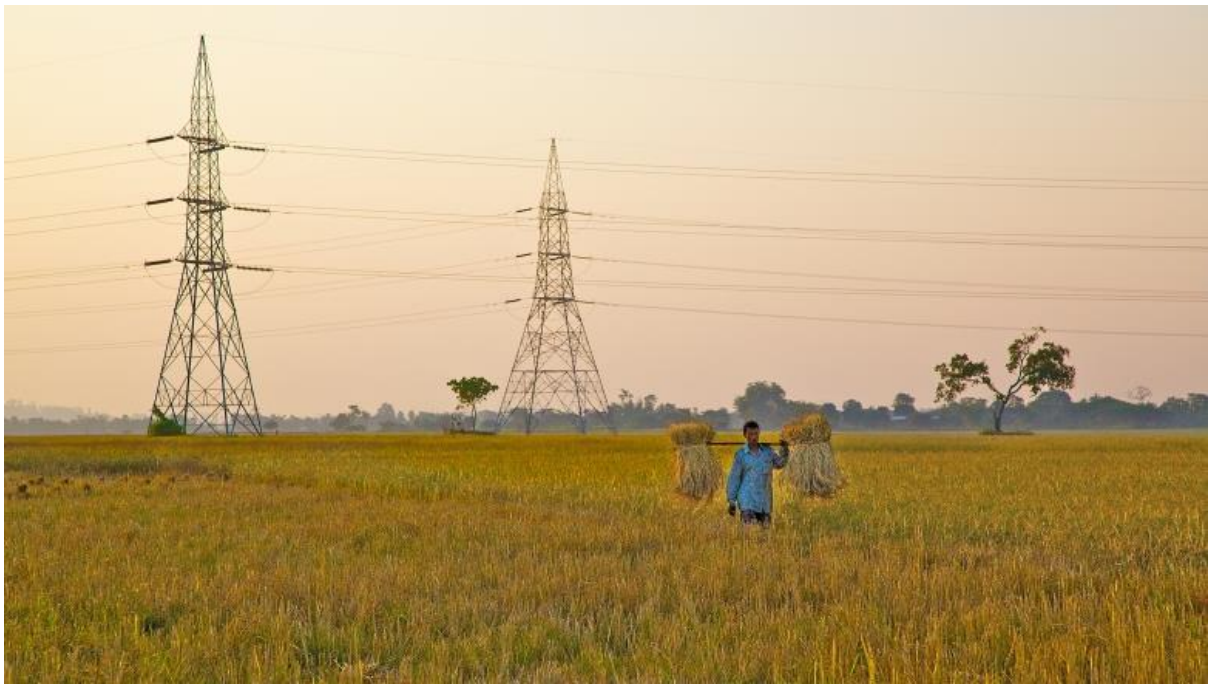
OF

SUB-GROUP ON AGRICULTURE SECTOR FOR ENERGY DATA MANAGEMENT

(ISSUES RELATED TO AGRICULTURE SECTOR)

By

Dr. S. K. Malhotra



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GOVERNMENT OF INDIA

August, 2019

REPORT

OF

SUB-GROUP ON AGRICULTURE SECTOR

FOR

ENERGY DATA MANAGEMENT

ISSUES RELATED TO AGRICULTURE SECTOR

NITI Aayog

August, 2019

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List of Abbreviations & Conversion

Sr. No.		
1	DAC&FW	Department of Agriculture Cooperation & Farmers Welfare.
2	CACP	Commission for Agricultural Costs and Prices
3	PMKSY	Pradhan Mantri Krishi Sinchai Yojana
4	PMFBY	Pradhan Mantri Fasal Bima Yojana
5	GDP	Gross Domestic Product
6	kWh	kilowatt hour (1 kWh = $3.6 \cdot 10^6$ J)
7.	MSME	Ministry of Micro, Small and Medium Enterprises
8	mmscmd	Million Metric Standard Cubic Meter per Day
9	*kTOE*	Kilo Tonnes of Oil Equivalent
10	NDSAP	National Data Sharing and Accessibility Policy
11	MSP	minimum support prices
Conversion		
kTOE		1 kWh = 0.085 kTOE
		1million litter = 2.4 kToE

1. Introduction

Agriculture supports 54% of the population, as against about 75% at the time of independence. The agriculture sector employs nearly half of the workforce in the country. However, it contributes to 17 % of the GDP. India's production of food grains has been increasing every year. India is among the top producers of several crops such as wheat, rice, pulses, sugarcane and cotton. It is the highest producer of milk and second highest producer of fruits and vegetables. In 2019-20, Government of India is targeting food grain production of 291 million tons.

Indian agriculture has come a long way since independence. There has been several policy statements designed for agriculture sector during the past few years to take India towards self-sufficiency in food grains. Recently ever highest record food grain production (285 million tonnes) and horticulture crops (315 million tonnes) have been achieved during 2017-18. However, demand for the products from the agricultural sector is rising rapidly with the increase in population and per capita income and growing demand from the secondary (manufacturing) sector.

Given the importance of agriculture sector, Government of India took several steps for its sustainable development. Steps have been taken to improve soil fertility on a sustainable basis through the soil health card scheme, to provide improved access to irrigation and enhanced water efficiency through Pradhan Mantri Krishi Sinchai Yojana (PMKSY), and use of machinery in agriculture for improving efficiency through Submission on Agriculture Machines and to support for creation of a unified national agriculture market to boost the income of farmers. Further, to mitigate risk in agriculture sector a new scheme "Pradhan Mantri Fasal Bima Yojana (PMFBY) has been launched in 2016.

1.1 Energy Data Management in Agriculture Sector

Agricultural sector requires energy as it is an important input to production. Agriculture uses energy directly as fuel or electricity to operate machinery and equipment, in irrigation such as use of fuel in running the tractors and other machinery, and for lighting on the farm, and indirectly in the fertilizers and chemicals produced off the farm. Modern agriculture needs modern energy - the two are closely linked. For many developing and under developed countries, agriculture is the dominant sector which contributes to the development of the economy. Increase in productivity and the modernization of agricultural production systems are the primary drivers of global poverty reduction and energy plays a key role in achieving this. Energy input to modern and sustainable agricultural production and processing systems is a key factor in moving beyond subsistence farming towards food security. Energy services neatly support the production process, e.g. by providing irrigation (pumps) or machinery in agriculture.

Energy use in agriculture has been increasing since Green Revolution with increasing use of diesel and electricity in farm operations. Fossil energy for mechanized agriculture has been an important driver of the "Green Revolution" of increasing farm productivity. Today, three energy inputs (diesel, fuel and electricity) account for more than three-quarters of farm energy use. Renewable energy can address many concerns related to fossil energy use. Ever increasing demand of energy has posed pressure on limited resources and has necessitated optimum use of resources. Therefore, there is a need for integrated and updated database on demand/supply of energy in agriculture sector for energy balance.

1.2 Current Status of Energy Data of Agriculture Sector

Directorate of Economics and Statistics is an attached office of the Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW). Its mandate is to collect, compile and disseminate economic and statistical data relating to agriculture and provide analytical inputs to the Department of Agriculture, Cooperation & Farmers Welfare for the formulation of better agricultural and economic development policies. Its mission is to provide important information on agricultural economics & statistics like area, production and yield of principal crops, minimum support prices (MSPs), monitor whole sale prices of agricultural commodities, implement schemes related to improvement of agricultural statistics, and carrying out agro-economic research studies. The main objectives of the Directorate are generation and dissemination of agricultural statistics, research and analysis. The Directorate provides inputs to DAC&FW, CACP and generates a large body of literature on agricultural economics and statistical information and make it available in the public domain for the use of all stakeholders.

Energy input to modern and sustainable agricultural production and processing systems is a key factor in moving beyond subsistence farming. But it was noted that there is non-availability of basic data for making further calculations on energy requirement as the engaged organizations (mentioned below) do not collect energy consumption data for agriculture sector.

1.3 Organizations responsible for collection of agriculture data

Organization	Type of data	Periodicity	Nodal ministry
Directorate of Economics and Statistics	Area, production and yield	Release estimates quarterly in a year, season wise for kharif and rabi also	DAC&FW in Ministry of Agriculture & Farmer Welfare
National Sample Survey Of India	Agriculture Census which includes data on size of holdings, irrigation, machinery etc.	Five years Report awaited for 2015-16	DAC&FW in Ministry of Agriculture & Farmer Welfare
Central Ground Water Board	Irrigation sources capacity		
Combine Harvester Association of India, Malerkotla Punjab	Number of combines, harvesters availability in each state		
Tractor Manufacture Association			
Power tiller Manufacture Association			

Central Electricity Authority	Electricity Consumption (kWh)	Annual	Ministry of Power

2. Working group on Demand Side Energy Data Management

To find out the data gaps in energy sector, a Working Group on Energy Demand (Consumption) side was constituted by NITI Aayog for energy data management on 16th May,2018 (the Order constituting the Working Group is given at ***Annexure-I***). A similar Working Group was constituted by NITI Aayog on 16th May, 2018 for covering the Supply Side under energy Data Management.

The first meeting of the *Demand Side* Working Group was held on 4th June, 2018.The Minutes of Meeting (MoM) of the same is given at ***Annexure-II***. It was seen that there are some gaps in the demand side data in the Agriculture sector, Industry sector, Buildings sector and Transport sector such as lack of data on fuel consumption in pump sets, solar pump data, MSME data, etc. After detailed discussions, the Working Group decided to form sub-groups on four major energy consuming sectors such as Agriculture sector, Industry sector, Buildings sector and Transport sector.

All the sub- groups were to identify the data being collected by different agencies currently in India and the mode& frequency of such collection. The sub-groups would then deliberate to explore if the frequency of data collection needs to be changed and if better mode can be suggested keeping in view the cost and quality of data.

For the data gaps which are identified, it was to be explored how this is being collected in other countries, and what would be the best method to collect in India. In this context, the current statutory provisions available in the Collection of Statistics Act, Energy efficiency Act and various other statutory instruments may be explored. The sub group, for the purpose of data collection, was to keep in mind the data pertaining to efficiency and cost.

3. Sub-group on Agriculture Sector for Demand Side Energy Data Management

Based on working group decision, a sub-group on Demand Side Energy Data Management in the Agriculture Sector was subsequently constituted for Energy Data Management vide NITI Aayog letter dated 13.06.2018 including officials from Ministry of Agriculture, TERI, BEE, CEA, Prayas Energy Group, Indian Council of Agricultural Research, MoSPI and PPAC as members of the sub-group. The order constituting the sub-group and the detailed Terms of reference of sub-group are given in ***Annexure-III.*** The composition of this sub-group is indicated below:

1	Dr. S. K. Malhotra, Agriculture Commissioner, Ministry of Agriculture & Farmers Welfare	Chairman
2	Sh. A.K. Saxena, Director, Energy & Resources Institute	Member

3	Shri. Ashok Sreenivas/ Shri Srihari Dukkipati, Senior Fellow, Prayas Energy Group	Member
4	Shri. Prahlad, Chief Engineer, Central Electricity Authority	Member
5	Shri Manoj Kumar Upadhyay, Dy. Adviser	Member convener
6	Dr. Kanchan Kumar Singh, ADG (Ag. Eng.), Indian Council of Agricultural Research	Member
7	Shri V.N. Kale, Additional Commissioner, Ministry of Agriculture, DACFW	Member
8	Ms. Bhawna Singh, Director, Ministry of Statistic and Program Implementation (MOSPI)	Member
9	Sh. Arijit Sengupta, Director, Bureau of Energy Efficiency	Member
10	Ms. Aashima Priye, Joint Director, Petroleum Planning & Analysis Cell	Member

3.1 Terms of Reference of the Agriculture sub-group:

- Sub-groups shall explore the best practices being followed internationally including by Energy Information Agency (EIA) of USA and IEA for the kind of data which is being collected and the modes of collection in the energy sector.
- The sub-groups shall also identify the data being collected by different agencies currently in India and the mode & frequency of such collection. The sub-group shall then deliberate if the frequency needs to be increased and if better mode can be suggested keeping in view the cost and quality of data.
- For the data gap which is identified, it should be explored how this is being done in other countries, what will be best method to collect it here. In this context, the current statutory provisions available in the Collection of Statistics Act, Energy Efficiency Act and various other statutory instruments may be explored. The sub-group may also suggest, if needed and current statutory provisions are not adequate, to enact a new statutory framework.
- The sub-group, for the purpose of data collection shall keep in mind the various implements/sectors/modes using energy in the sector, different forms of energies being used and data pertaining to efficiency and cost.
- Sub-group is required to complete the work and submit the report in six months with its findings in reference to the terms of reference specified. The sub-group will meet once in a month and submit its report to NITI Aayog.

3.2 Meetings of Sub-group

A total of five meetings of the Agriculture sub group for Energy Data Management were held in NITI Aayog. The first three meetings were held under the Chairmanship of Dr. S.K. Malhotra, Agriculture Commissioner, Ministry of Agriculture and Farmers Welfare on 20th July 2018, 5th September 2018 and 11th October 2018 respectively. The minutes of the meetings are given at ***Annexure-IV, Annexure-V and Annexure-VI*** respectively.

The Fourth meeting of the sub-group was held in NITI Aayog on 4th January, 2019 under the Chairmanship of Shri R. P. Gupta, Additional Secretary (Energy), NITI Aayog. The minutes of the meeting are given at ***Annexure-VII*****.**

The Fifth meeting of the sub-group was held in NITI Aayog on 15th March, 2019 under the Chairmanship of Dr. S. K. Malhotra, Agriculture Commissioner, Ministry of Agriculture & Farmers Welfare and the minutes of the meeting are given at ***Annexure-VIII***. The Sixth meeting of Sub Group was held on 4th July, 2019 under the Chairmanship of Additional Secretary (Energy), NITI Aayog the minutes of the meeting are given at ***Annexure-IX. The 7th and final meeting was held on 2nd August, 2019, wherein the sub-group has accepted the report.***

After detailed discussions and deliberations during the five meetings, following data gaps were identified and accordingly data formats were developed to bridge the gaps:

4. Data Gaps & Formats

The sub-group on Agriculture sector data management was given the task to assess availability of energy consumption and demand data, frequency & source of the data collection and hence identify the gaps in the existing system and therefore update them for making agriculture sector energy consumption information available to public, private, think-tank for policy formulation, research etc, on public domain.

Agricultural practises use energy primarily in form of petroleum-based fuels or electricity to operate machinery for preparing fields, planting and harvesting crops, applying chemicals and to power crop dryers and irrigation equipment.

For this purpose, the sub-group identified two major areas i.e. ***Irrigation and Machinery*** for energy demand assessment. The data formats have been created in form of a ***Master Table*** that reflects the overall energy consumptions from Irrigation and Machinery. The irrigation and Machinery table has further been broken down into sub-tables. Machinery tables includes energy consumption in Tractors, Power Tillers, Combine Harvesters and other equipment like weeders, sprayers etc. and Irrigation tables includes Canal lift, Tubewells, ponds/wells, micro-irrigation and other sources. The identified types of fuels used in the agriculture sector along with the units are as follows:

- **Oil *(million litres)*:** Diesel, LDO, Furnace Oil and others
- **Natural Gas *(mmscmd)***
- **Electricity *(kWh):*** Grid Connected, Renewables (Solar,)

The final energy consumption is to be calculated in ***kTOE***, (1 kWh = 0.085 kTOE, 1million litter = 2.4 kToE) after uniform conversion of respective resources. The master table is provided below along with the detailed formats for sub-tables as identified by the group.

4.1 Composite Data Agriculture *(Final Master Table)*

Type of fuel	Agriculture										
		Machinery (reference table 4.3 (a), (c), (d), & (e))					**Irrigation (reference table 4.4 (a), (b) & (c))**				
	Sub category	Source	Volume	Conversion unit	Ktoe	Frequency	Source	Volume	Conversion unit	Ktoe	Frequency
Oil (M.litres)	Diesel										
	LDO										
	Furnace Oil										
	Others										
Natural gas (mmscmd)											
Electricity (kWh)	Grid connected										
	Others										
Renewable (kWh)	Solar										
	Wind										
	Others										
Total (Ktoe)											

4.2 Data Collection Methodology

The sub-group enquired about availability of data from MoSPI, Ministry of Agriculture and other sources and found that energy data related to agriculture sector is not documented anywhere. Therefore, sub-group adopted projection & survey based approach for collating the data in order to bridge the existing gaps.

Survey of the Data: Sub-group identified the data to be collected through survey, its frequency and agency to conduct survey.

Projection of the Data: Based on the survey conducted, the projection of the required data is proposed to be done by using linear equations which has been explained along with each table.

4.3 Machinery related Energy Data Format

The complete energy consumption through various units for the purpose of machinery has been discussed through tables with detailed components as follows along with calculation factors:

Table 4.3: Energy requirement for Machinery in Agriculture *(Master Table: Machinery)*

Type of fuel		Tractors (reference table 4.3 (a))					Power Tillers (reference table 4.3 (c))					Combine Harvesters (reference table 4.3 (d))					Others (weeders, sprayers etc.) (reference table 4.3 (e))				
		Source	Volume	Conversion unit	Ktoe	Frequency	Source	Volume	Conversion unit	Ktoe	Frequency	Source	Volume	Conversion unit	Ktoe	Frequency	Source	Volume	Conversion unit	Ktoe	Frequency
Oil (million litres)	Diesel																				
	LDO																				
	Furnace Oil																				
	Others																				
Natural gas (mmscmd)																					
Electricity (kWh)	Grid connected																				
	Others																				
Renewable (kWh)	Solar																				
Total (Ktoe)																					

The total area tilled for cultivating purpose is to be segregated based on the use of tractors and power tillers and respective areas are to be used for the calculations. The detailed composition of the above table is given in the tables for sub-components below:

(a) Tractors: The use of tractors in this report includes agricultural activity along with transportation activity. Therefore the committee recommended that the calculations should be based on the season-wise (Rabi and Kharif) areas ploughed for the cultivation for different crops based upon the total hours and number of operations carried out in each cycle crop wise.

Data format

Table 4.3 (a): Diesel requirement for Tractors in Agriculture

S. No.	State	Gross Cropped Area (Million hectare)			Average hours of operation per hectare (Hr./ ha)	Diesel needed per hour	Annual Diesel requirement (Million Liters)
		Kharif	Rabi	Total			
		A	B	C	D	E	C*D*E*365
Total							

Methodology: The above format would help calculating the annual requirement of diesel for tractors in agriculture using following components:

A. Gross Area cropped (in million Hectares) during Kharif Season
B. Gross Area cropped (in million Hectares) during Rabi Season
C. Total Area cropped (in million Hectares)
D. Average hours of operation of tractor needed per hectare of crop (Hr./Ha)
E. Diesel consumed by tractor per hour of operation (l/hr.)

Annual requirement per crop = C * D * E *365 million litter

Adding the total diesel requirement of all crops together will provide us annual diesel requirement for tractors (***in million liters***).

***Sources and Frequency of Components*:**

Component	Source	Frequency	Survey Focus
Total Area cropped (Rabi & Kharif)	All India Report on Input Survey, Deptt. of Agriculture & Cooperation (Agricultural Census Division) Ministry of Agriculture & Farmers Welfare	Annual	Ministry of Agriculture
Average Hours of operation of tractor needed per hectare of crop	Survey Based	5 years	Farmers
Diesel consumed per hour	Survey Based	5 years	Tractor owner

Table 4.3 (b): Diesel requirement for Tractors for other purposes (Transportation etc):

S. No.	State	State wise no of tractors	Average hours of tractor operations per day for other than agriculture purpose	Diesel needed per hour	Annual Diesel requirement (Million Liters)
		A	B	C	A*B*C*365
Total					

Methodology: The above format would help calculating the requirement of diesel for tractors for all purpose including agriculture using following components:

A. State wise no of tractor
B. Average hours of operations per day
C Diesel needed per hour (l/hr.)

Annual Diesel requirement for all purpose = A*B*C*365 million litter

Adding the total diesel requirement of all states together will provide us the diesel requirement for tractors (***in million liters***) for all purpose including agriculture, transport etc.

***Sources and Frequency of Components*:**

Component	Source	Frequency	Survey Focus
State wise no of Tractors	Ministry of Agriculture & Farmers Welfare/ Tractor Manufacture Association/ Tractor Manufacturing Company	Annual	
Average hours of operations per day	Survey based	5 Years	Tractor owner
Diesel needed per hour (l/hr.	Survey based	5 Years	Tractor owner

(b). Power tillers: Power tillers are used for tilling the small farms along with other agricultural operations such as seed bed preparation and sowing. After discussions during the meetings, it was decided that diesel consumption in power tillers should be as per the crop seasons (Kharif and Rabi) calculated based on the hours of usage of power tillers in each season cycle, crop wise. **Power tillers needed for tilling agriculture land (which is not tilled through tractor) and horticulture / fruit crop area.**

Data format

Table 4.3 (c): Diesel requirement for Power Tillers in Agriculture

S. No.	State	Gross Cropped Area (Million hectare)			Average hours of operation of Power Tiller per hectare (Hr./ha)	Diesel needed per hour (l/hr.)	Annual Diesel requirement (Million Liters)
		Kharif	Rabi	Total			
		A	B	C	D	E	C*D*E*365
Total							

Methodology: The above format would help calculating the requirement of diesel for power tillers using following components:

A. Gross Area cropped (in million Hectares) during Kharif Season
B. Gross Area cropped (in million Hectares) during Rabi Season
C. Total Area cropped (in million Hectares)
D. Average hours of operation of power tillers needed per hectare
E. Diesel consumed per hour of power tiller operation (l/hr.)

Annual Diesel requirement per crop = C * D * E *365

Adding the total diesel requirement of all crops together will provide us annual diesel requirement for power tillers (in million liters).

Sources and Frequency of Components:

Component	Source	Frequency	Survey Focus
Total Area cropped (Rabi & Kharif)	All India Report on Input Survey, Deptt. of Agriculture & Cooperation (Agricultural Census Division) Ministry of Agriculture & Farmers Welfare	Annual	Ministry of Agriculture
Average hours of power tiller needed per hectare per crop or fruit crop	Survey Based	5 years	Farmers
Diesel consumed per hour	Survey Based	5 years	Power tillers owner

(c). Combine Harvesters: Combine Harvesters run on diesel and are used for harvesting the crops combining three separate harvesting operations—reaping, threshing, and winnowing—into a single process. It was recommended that the diesel consumption in combine harvesters should be as per the crop seasons (Kharif and Rabi) calculated based on the hours of usage of all the machines combined together, each season cycle, crop wise.

Data format

Table 4.3 (d): Diesel requirement for Combine Harvesters in Agriculture

S. No.	State	Gross Cropped Area (Million hectare)			Average hours of operation of combine harvesters needed per hectare (Hr./ha)	Diesel needed per hour (l/hr.)	Annual Diesel requirement (Million Liters)
		Kharif	Rabi	Total			
		A	B	C	D	E	C*D*E*365
Total							

Methodology: The above format would help calculating the requirement of diesel for combine harvesters using following components:

A. Gross Area cropped (in million Hectares) during Kharif Season
B. Gross Area cropped (in million Hectares) during Rabi Season
C. Total Area cropped (in million Hectares)
D. Average hours of operation of combine harvesters needed per hectare (in hrs./ha.)
E. Diesel consumed per hour of operation (l/hr.)

Annual Diesel requirement per crop = C * D * E*365million litter

Adding the total diesel requirement of all crops together provide will provide us the diesel requirement for combine harvesters (in million liters).

Sources and Frequency of Components:

Component	Source	Frequency	Source approach
Total Area cropped (Rabi & Kharif)	All India Report on Input Survey, Deptt. of Agriculture & Cooperation (Agricultural Census Division) Ministry of Agriculture & Farmers Welfare	Annual	Ministry of Agriculture
Average Hours of operation of combine harvesters needed per hectare per crop	Survey Based	5 years	Farmers
Diesel consumed per hour	Survey Based	5 years	Combine harvester owner

(d). Others: Other machinery used in agriculture includes weeders, power sprayers etc. It was recommended that the diesel consumption in these machines should be as per the crop seasons (Kharif and Rabi) calculated based on the hours of usage of all the machines combined together, each season cycle, crop wise.

Data format

Table 4.3 (e): Diesel requirement for other machines (Weeders, sprayers etc.) in Agriculture

S. No.	State	Gross Cropped Area (Million hectare)			Average hours of operation (weeders + sprayers) per hectare (Hr./ha)	Diesel needed per hour (l/hr.)	Annual Diesel requirement (Million Liters)
		Kharif	Rabi	Total			
		A	B	C	D	E	C*D*E*365
Total							

Methodology: The above format would help calculating the requirement of diesel for combine harvesters using following components:

A. Gross Area cropped (in million Hectares) during Kharif Season
B. Gross Area cropped (in million Hectares) during Rabi Season
C. Total Area cropped (in million Hectares)
D. Average hours of operation per hectare (in hrs. /ha.)
E. Diesel consumed per hour of operation (l/hr.)

Annual Diesel requirement per crop = C * D * E *365 million litter

Adding the total diesel requirement of all crops together will provide us the annual diesel requirement for other machines (in million liters).

Sources and Frequency of Components:

Component	Source	Frequency	Source approach
Total Area cropped (Rabi & Kharif)	All India Report on Input Survey, Deptt. of Agriculture & Cooperation (Agricultural Census Division) Ministry of Agriculture & Farmers Welfare	Annual	Ministry of Agriculture
Average Hours of operation per hectare per crop	Survey Based	5 years	Farmer
Diesel consumed per hour	Survey Based	5 years	Weeders & sprayers owner

4.4 Irrigation related Energy Data Format

The complete energy consumption through various units for the purpose of irrigation has been discussed through tables with detailed components as follows along with calculation factors: .

Table 4.4: Energy requirement for Irrigation in Agriculture *(Master Table: Irrigation)*

Sl no.	State	Electricity (reference table 4.4 (a)					Diesel (reference table 4.4 (b))					Solar (reference table 4.4 (c))					Total				
		Source	Volume	Conversion unit	Ktoe	Frequency	Source	Volume	Conversion unit	Ktoe	Frequency	Source	Volume	Conversion unit	Ktoe	Frequency	Source	Volume	Conversion unit	Ktoe	Frequency
Total (Ktoe)																					

The detailed composition of the above table are given in the tables for sub-components below:

(a). Electricity : When the main source is at the lower level than the supply level, then water is supplied through electric/ diesel pump-sets from the canal. The requirement of electricity/ diesel for the pumps can be calculated state-wise number of pumps connected by electricity combined with the rating of pump motor.

Table 4.4 (a) Electricity required for irrigation

S. No.	State	DISCOM	DISCOM wise No of Agriculture connection	Average motor rating (kW)	Discom wise consumption (kWh)	T & D Losses (kWh)	Total electricity consumed (kWh)
					A	B	A+B
Total							

Table 4.4 (b) Diesel required for irrigation

S. No.	State	Diesel pumps per state	Diesel consumption per hour	Average hours of operation per day (h)	Total annual Diesel consumption (million liter)
		A	B	C	(A * B * C * 365)
Total					

Methodology: The above format would help calculating the requirement of diesel for irrigation using canal lift through following components

A. No. of diesel pumps in respective state
B. Diesel consumption per hour)
C. Average hours of pump operation (h)

Annual diesel Consumed per state = (A * B * C *365)

Annual Final consumption of diesel pumps for irrigation is the combined total of annual diesel consumed per state (in million liters)

Sources and Frequency of Components:

Component	Source	Frequency	Source Approach
No. of Diesel Pumps in a State	Survey Based/ Diesel Pump Set Manufacturer	5 year	Farmer/ Diesel Pump Set Manufacturer
Diesel consumption per hour	Survey Based	5 years	Farmers
Average hours of operation	Survey Based	5 years	Farmers

Table 4.4 (c) Irrigation by Solar Pump

Solar Power by Solar Pump

S. No.	State	No. of Solar Pumps	Capacity of Solar Pump (kW)	Capacity Utilization factor (%)	Average hours of Solar pump operation per day	Annual Generation (kWh)	Average hours of Solar pump Utilization per day	Annual Utilized Energy (kWh)	Annual Un-utilize Energy (kWh)	Annual Solar Power on Grid (kWh)
		A	B	C	D	E=A*B*C*D*365	F	G=A*B*C*E*365	E-G	By DISCOM
Total										

Methodology: The above format would help calculating the requirement of electricity (Grid and solar, respectively) for irrigation

A. No. of total Solar Pump in the State
B. Capacity of Solar Pump (kWh)
C. Capacity Utilization factor (%)
D. Average hours of operation per day
E. Annual Generation (kWh)= E=A*B*C*D*365
F. Average hours of Utilization per day
G. Annual Utilized Energy (kWh)= G=A*B*C*E*365
H. Annual Un-utilize Energy (kWh)= E-G
I. Annual Solar Power on Grid (kWh)

Sources and Frequency of Components:

Component	Source	Frequency	Source Approach
No. of total Solar Pump in the State	By DISCOMs/MNRE	Annual	MNRE/DISCOMs
Capacity of Solar Pump (kWh)	By DISCOMs/MNRE	Annual	MNRE/DISCOMs
Capacity Utilization factor (%)	By DISCOMs/MNRE	Annual	MNRE/DISCOMs
Average hours of operation per day	Survey Based	5 Years	Farmers
Average hours of Utilization per day	Survey Based	5 Years	Farmers
Annual Solar Power on Grid (kWh)	DISCOMs	Annual	DISCOMs

5. Recommendations by the sub-group

Based on discussions during the meetings and inputs from the Group of MoSPI, Ministry of Agriculture & Farmer Welfare, BEE, CEA and PPAC the following recommendations are made by the sub Group on Demand Side Energy Data Management in Agriculture Sector:

i. Sub-group has tried to calculate energy demand for agriculture sector. However, the projections are not complete because lack of availability of granular data as required in the prescribed formula. Therefore, sub-group adopted projection and survey based approached for collecting the data in order to bridge the gap as explained in para 4.3 & 4.4 and its related table in the main report.

ii. 90% energy data related to agriculture sector is not documented in the central & state ministries/departments, therefore, sub-group recommends survey to collect the required data as mentioned in the para 4.3 & 4.4 and it related table in the main report. It is recommended that survey should be carried out by Ministry of Agriculture & Farmer Welfare. The data collected from the first survey would be used for period of 5 years.

iii. The frequency of the survey can be increased and Ministry of Agriculture & Farmer Welfare may try to make it an annual practice once the base line platform for the data has been establish.

iv. Ministry of Agriculture & Farmer Welfare (MoA&FW) should establish a data cell which may subsequently establish data cells in each state's agriculture department. The state's data should finally be integrated in the data cell establish Ministry of Agriculture & Farmer Welfare. The data format created by the sub-group may be converted for state level and further it may be converted to district level, block level as per the requirement.

v. A National Agriculture Energy Consumption Portal should be made which can published data in spreadsheet format and this should be extended to include all daily, monthly and annual reports published by MoA&FW and other sources. Annual publications of MoA&FW that are currently only available in printed format should be published in electronic (pdf) format, along with the data being made available in spreadsheet format.

vi. All data that is published should be available in easy-to-process formats such as spreadsheets and APIs should be provided to access this data. In this regard, the guidelines provided under the National Data Sharing and Accessibility Policy (NDSAP) may be followed.

6. Conclusion

It is first time that a sub-group is working on collection and compilation of the Energy data related of agriculture sector. The importance of energy data of agriculture sector is immense and it may be used for better planning for shifting from fossil fuel based energy to clean & green energy in the sector. The work done by sub-group is the base work in this direction and it may further be enhanced as per availability of the data and requirement of the sector.

126943/2018/Infra-E

No. P-11011/3/2017-Energy
(NITI Aayog)
(Energy, Climate Change & Overseas Engagements)

NITI Aayog, Sansad Marg,
New Delhi-110001.

Dated: 16th May, 2018.

Office Memorandum

Subject: Constitution of working group on demand (consumption) side data management.

The undersigned is directed to refer to para 19 of the minutes of meeting held on 27th & 28th March, 2018 regarding meeting on energy data management - NITI Aayog and Energy Data Management Agencies in India with IEA. Under para 19 of the said minutes of meeting, it was decided that NITI Aayog will constitute two working groups to strengthen Energy Data Management System (EDM) in India. The first working group will cover energy data on supply side and second working group will cover energy data on demand (consumption) side. The working group covering energy data on demand (consumption) side will have separate sub-groups on transport, buildings, industry, agriculture etc.

2. In view of above, competent authority in NITI Aayog has approved constitution of second working group on demand (consumption) side data management under Chairmanship of Shri R.P. Gupta, Additional Secretary (Energy), NITI Aayog with following composition:

1.	Shri R.P. Gupta, Additional Secretary (Energy), NITI Aayog	Chairman
2.	Dr. Ajay Mathur, Director General, TERI	Member
3.	Sh. Abhay Bakre, Director General, Bureau of Energy Efficiency	Member
4.	Shri Raj Pal, Economic Adviser, Ministry of Power	Member
5.	Shri K. Guite, Adivser (Transport), Ministry of Road Transport & Highways	Member
6.	Dr. S.K. Malhotra, Agriculture Commissioner, Ministry of Agriculture	Member
7.	Shri G S Negi, Economic Adviser, Department of Industrial Policy and Promotion	Member
8.	Ms. Promodita Sathish, Economic Adviser, Ministry of Steel	Member
9.	Shri Anjani Kumar, Coal Controller, Coal Controller Organization	Member
10.	Ms. Atrejee Das, Director General, Petroleum Planning & Analysis Cell	Member
11.	Ms. G. S. Lakshmi, DDG, Ministry of Statistic and Program Implementation	Member
12.	Dr Satish Kumar, President and Executive Director, Alliance for an Energy Efficient Economy	Member
13.	Shri Ashok Sreenivas/ Shri Srihari Dukkipati , Senior Fellow, Prayas Energy Group	Member
14.	Mr. Duncan Millard/Ms. Celine Rouquette, Chief Statistician, IEA	Member
15.	Shri Vaibhav Gupta, Senior Programme Lead , Council on Energy, Environment and Water	Member
16.	Shri Nanda Srinivasan, Statistical Method Experts, Energy Information Administration	Member

3. Committee may also co-opt (as member) any Central/ State Government Official/ Expert/ Think-tank, if required. Committee may consult all stake holders including State Governments.

4. The general terms of reference (ToR) of the Committee are as under:

a. To identify the demand (consumption) side energy data gap.
b. Constitution of separate sub-working group on transport, buildings, industry, agriculture etc.
c. To develop uniform formats for demand (consumption) side energy data collection in the energy sector for energy data management agencies and remove redundancy if any.
d. To decide energy related reports to be published by different energy ministries/ data management agencies and remove redundancy if any.
e. To create online real time data collection and data sharing platform in between different energy data management agencies.
f. To develop a system for capacity building, training programme of international standard for energy data management agencies.
g. To develop a system for mutual exchange programme of energy domain expert from different energy data agencies (international and domestic).
h. To strengthen Energy Data Management System in NITI Aayog.
i. Any other ToR suggested by committee.

5. The committee may submit final report in three months to NITI Aayog.

This issues with the approval of competent authority.

(Manoj Kumar Upadhyay),
Deputy Adviser,
Telephone: 011-23096757.

16.5.18
जारी
ISSUED

To,

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4. **Shri K. Guite, Adivser (Transport), Transport Research Wing, IDA Building Jamnagar, Ministry of Road Transport & Highways, New Delhi. Ph. No.: 23384160, 9868934337, E-mail id: guite@nic.in**
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6. **Ms. Promodita Sathish, Economic Adviser, Ministry of Steel, Udyog Bhawan, New Delhi-110001. Ph. No.: 23063020.**
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10. **Ms. G.S. Lakshmi, DDG, Ministry of Statistic and Program Implementation, Room No.413, Level –IV, East Block 6, R.K.Puram, Sec-I, New Delhi-110066. Ph. No.: 26188462, E-mail Id: lakshmi.g@nic.in**
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Copy to:-

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2. Sr. PPS to CEO, NITI Aayog
3. Member (VKS), NITI Aayog
4. PS to Additional Secretary (Energy), NITI Aayog
5. PA to Joint Adviser (Energy)/Joint Adviser (Coal)/Joint Adviser (MNRE & PNG)
6. Deputy Adviser (Dr. R.K. Pradhan)
7. Economic Officer (Power)/ YP (Shri Anurag Mishra, Shri Abhinav Trivedi, Ms. Simi, Ms. Shafqat)

No. P-11011/3/2017-Energy

(NITI Aayog)
(Energy, Climate Change & Overseas Engagements)

NITI Aayog, Sansad Marg,
New Delhi-110001.

Dated: 11th June, 2018.

Office Memorandum

Subject: Minutes of the first meeting of the working group on demand (consumption) side energy data management.

A list of participant is at Annexure-I.

2. First meeting of the working group on demand (consumption) side energy data management was held in NITI Aayog on 4th June, 2018 under Chairmanship of Additional Secretary (Energy), NITI Aayog.

3. At the outset, Shri Rameshwar Prasad Gupta, Additional Secretary (Energy), NITI Aayog welcomed all participants and briefed that the meeting is being convened to understand the status of existing data collection/ dissemination system in India. He also stated that the main objective of the meeting is to create system of data management on real time basis in the various energy data management agencies to improve demand (consumption) side energy data management.

4. The current status of data management in India, issues with energy data collection system, sector wise energy data gaps and initiative taken by NITI Aayog to strengthen energy data management system were discussed. The Working Group felt the need to strengthen Energy Data Management System in India and Energy Data Management Agencies to work on following action points:

i. To strengthen existing energy data collection/ dissemination system of energy data management agencies like CEA, CCO, PPAC, MoP&G, Ministry of Road Transport & Highways, Ministry of Agriculture, Department of Industrial Policy & Promotion, Ministry of Housing and Urban Affairs (in coordination with Ministry of Rural Development) etc. to improve demand side energy data.
ii. To strengthen MoSPI energy data collection and reporting system especially in respect of unconventional energy sources (wood etc.) for improving energy balance reported in India.
iii. To develop mechanism for real time energy data update for building dynamism in energy sector planning.
iv. To undertake capacity building & training programmes for Energy Data Management Agencies in association with IEA and other stakeholders.

5. DG, TERI was of the view that consolidation is required for existing energy related data on demand side and there is a need to identify the gaps. He indicated that data related to consumption of electricity needs to be strengthen specially load curves which helps to

understand the gap between demand and supply. He emphasised to strengthen data related to consumption of fuel for cooking purpose as biomass related data is not available. He emphasised the need of strengthening survey of industries data for capturing energy related data.

6. Representative from BEE mentioned that BEE is collecting data of energy intensive industries and appliances on quarterly basis and BEE has started collecting data for building sector as well. He mentioned the energy data related to small industries and transport is not being collected at present.

7. Representative from Ministry of Agriculture stated that data related to pump sets, tractors etc. which consume energy is available with the Ministry which can be shared for strengthening energy data management system.

8. Representative from Petroleum Planning & Analysis Cell mentioned that petroleum and natural gas related data is being collected through annual surveys but normalisation of data is not being done. He also mentioned that for strengthening energy data management system there is need to ascertain that which data needs to be captured and at what frequency.

9. Representative from Department of Industrial Policy and Promotion (DIPP) mentioned that DIPP does not collect any energy related data. The energy related data available with MOSPI is being used by DIPP.

10. Representative from Ministry of Statistic and Programme Implementation (MoSPI) stated that very little data is available for energy demand (consumption) side. It was also informed that MoPNG, MNRE, PPAC, CEA etc. are providing data in the pdf format and then MoSPI is converting it into the excel sheet for preparing energy balance. MoSPI informed that time delay in getting the data from respective agencies and unavailability of data of unconventional energy sources are main issues faced by them. The energy balance prepared by MoSPI in its energy statistic publication has scope of further improvement if energy economists and energy domain experts prepare the energy balance. Therefore, MoSPI needs capacity building programme in energy domain.

11. Representative from Coal Controller's Organisation stated that a large gap exists in coal consumption data, which needs strengthening. There is a need to identify the gaps for consumption related coal data for strengthening energy data management system. The committee observed that there is a time lag of one year in coal data availability which needs to be reduced by using technology intervention.

12. Representative from Prayas emphasised that there is a need to appoint nodal officers from energy data agencies to identify energy related data gaps, how to bridge this gap and how to improve their online data management system related to their sector.

13. Representative from Council on Energy, Environment and Water gave a presentation on energy data gaps in industry, transport, buildings and agriculture sector. He also suggested actions to be taken which will help in improvement of energy data management system and help in determining future trajectories for energy demand assessment. It was emphasised that Ministry of Environment, Forests and Climate Change should be a part of working group for energy data management system improvement.

14. Representative from International Energy Agency (IEA) who attended the working group through video conference highlighted the different agencies from which IEA is collecting data for its World Energy Outlook. She also informed how IEA uses energy statistics from India to build an energy balance and assumptions IEA currently used. It was stated that there is a lot of data gap exists in the energy data collection in respect of biogas, bio fuels, charcoal, bagasse wood etc. It was stated that there is a need of uniform data collection formats for data management agencies in India so that it can be easily utilized by different stakeholders. It was emphasised that it would be useful to have more detailed data on end use for most fuels and there is a very strong need by strengthening energy of data management agencies and proper synchronization is required in their operation for data collection and generation of various reports. IEA stated to extend support for capacity building of energy data management agencies.

15. After detailed deliberation, it was decided to form sub-groups for each of the consumption sectors to be headed by the Joint Secretary of the respective Ministry.

a. Formation of sub-groups: Transport sub-group to be headed by Joint Secretary (Transport), Ministry of Road Transport & Highways, agriculture sub-group to be headed by Joint Secretary, Ministry of Agriculture, building sub-group to be headed by Joint Secretary, Ministry of Housing and Urban Affairs and industry sub-group to be headed by Joint Secretary, Department of Industrial Policy & Promotion.
b. Sub-groups shall explore the best practices being followed internationally including by Energy Information Agency (EIA) of USA and IEA for the kind of data which is being collected and the modes of collection in the energy sector.
c. The sub-groups shall also identify the data being collected by different agencies currently in India and the mode & frequency of such collection. The sub-group shall then deliberate if the frequency needs to be increased and if better mode can be suggested keeping in view the cost and quality of data.
d. For the data gap which is identified, it should be explored how this is being done in other countries, what will be best method to collect it here. In this context, the current statutory provisions available in the Collection of Statistics Act, Energy Efficiency Act and various other statutory instruments may be explored. The sub-group may also suggest, if needed and current statutory provisions are not adequate, to enact a new statutory framework.
e. The sub-group, for the purpose of data collection shall keep in mind the various implements/sectors/modes using energy in the sector, different forms of energies being used and data pertaining to efficiency and cost.

Formation of sub-groups:

16. Working group on demand (consumption) side energy data management agreed to constitute **transport sub-group to be headed by Joint Secretary (Transport), Ministry of Road Transport & Highways, agriculture sub-group to be headed by Joint Secretary, Ministry of Agriculture, building sub-group to be headed by Joint Secretary, Ministry of Housing and Urban Affairs** and **industry sub-group to be headed by Joint Secretary, Department of Industrial Policy & Promotion**. Members of the working group from respective Ministries will convene and coordinate sub-group meetings related to their Ministry. However, in case of building sub-group the meeting will be convened and coordinated by Working Group member from BEE.

17. Each sub-group is required to complete the work and submit the report in six months with its findings in reference to the terms of reference specified. The each sub-group will meet once in a month and submit its report to NITI Aayog. Generalise terms of reference of sub-groups is given below:

- To identify the data source, frequency and format in which it is available, and identify a means to make such data available in public domain in an easy to access form.
- To identify the energy data gaps. This would cover data related to fuel-wise quantity of energy, efficiency, price and so on.
- To identify each data item that is not presently available, classify it as either easy to get or hard to get.
- For each easy to get data item, develop a roadmap for how the data can be collected, validated and published.
- For each data item that is hard to get, identify the primary reasons / barriers for why it is hard and possible ways of working for collection.
- To develop uniform formats for data collection in the energy sector for energy data management agencies and remove redundancy if any.
- To create online real time data collection and data sharing platform in between different energy data management agencies.

1. **Transport sub-group:**

- Chaired by: Joint Secretary, Ministry of Road Transport & Highways
- Convener and Coordinator: Economic Adviser, Ministry of Road Transport & Highways
- Members include representatives of Ministry of Civil Aviation, Ministry of Railways, Ministry of Shipping, CEA, PPAC, MoSPI, BEE, TERI, Prayas, NITI Aayog or any other member decided by sub-group.
- Specific ToR: (i) To workout energy related data required for transport sector. (2) To include data on public and private transport, freight transport and on all modes of transport (rail, road, shipping, aviation etc.)

2. **Agriculture sub-group:**

- Chaired by: Joint Secretary, Ministry of Agriculture
- Convener and Coordinator: Economic Adviser, Ministry of Agriculture
- Members include representatives of CEA, PPAC, Prayas, MoSPI, BEE, TERI, AEEE, NITI Aayog or any other member decided by sub-group.
- Specific ToR: (1) To workout energy related data required for agriculture sector. (2) Data to include not only irrigation related data (electric, diesel and solar pumps) but also farm implements (tractors, harvesters, sowers etc.).

3. **Building sub-group:**

- Chaired by: Joint Secretary, Ministry of Housing and Urban Affairs
- Convener and Coordinator: BEE
- Members include representatives of Ministry of Rural Development, CEA, MoSPI, BEE, TERI, AEEE, Prayas, NITI Aayog or any other member decided by sub-group.
- Specific ToR: (1) To workout energy related data required for building sector (to include energy consumption by residences and commercial establishments). (2) The sub-group should include data not only related to electricity use in buildings but also cooking fuel use (including biogas, biomass etc.).

4. **Industry sub-group:**

- Chaired by: Joint Secretary, Department of Industrial Policy & Promotion
- Convener and Coordinator: Economic Adviser, Department of Industrial Policy & Promotion
- Members include representatives of Ministry of Steel, Ministry of Micro, Small and Medium Enterprises, CEA, PPAC, MoSPI, BEE, TERI, CEEW, CCO, Ministry Environment, Forest & Climate Change, NITI Aayog or any other member decided by sub-group.
- Specific ToR : (1) To workout energy related data required for industry sector (2)To include energy data related to all major sectors such as steel, cements, chemicals & fertilizers, heavy industries, MSME etc. (3) The sub-groups shall, in particular, suggest how data can be collected from medium & small scale industries.

18. The sub-groups would seek assistance from international partner agencies such as EIA and IEA to gain from international best practices to strengthen data collection and dissemination in India. In this context, IEA has agreed to help each sub-group to use the Energy Efficiency template that the IEA uses to collect data on the end use of energy from its member, to allow the members of the sub-group identify what data sources they had to understand energy use and efficiency against the agreed international reporting framework. This would help sub-group to understand what data already exists and highlight key areas for missing data. The sub-groups may work out the need of training of officials of data collection agencies and recommend accordingly in its report. The sub-groups would identify the need of using Collection of Statistics Act to mandate data collection for filling the data gap wherever it is required.

19. It was decided that the working group on demand (consumption) side energy data management will meet every 3 months. In this meeting, the progress made by each sub-group will be presented and discussed for future course of action.

The meeting ended with the vote of thanks to chair.

(Manoj Kumar Upadhyay)
Deputy Adviser (Power)
Telephone: 011-23042422

To,

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9. Shri Anjani Kumar, Coal Controller, Coal Controller's Organization, 1, Council House Street, Kolkata-700001. Phone: 033-22489613-16, E-mail id: coalcont-wb@nic.in
10. Ms. Atreyee Das, Director General, Petroleum Planning & Analysis Cell (PPAC), 2nd Floor, Core-8, SCOPE Complex-7 Institutional Area, Lodhi Road, New Delhi - 110003. Telephone: 011-24306191/92, E-mail id: webadm@ppac.gov.in
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13. Shri Ashok Sreenivas/ Shri Srihari Dukkipati, Senior Fellow, Prayas Energy Group, Unit III A & B, Devgiri, Joshi Railway Museum lane, Kothrud Industrial Area, Kothrud, Pune, MH 411038. Telephone: 91-20-25420720, E-mail id: ashok@prayaspune.org & srihari@prayaspune.org
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Copy to:-

1. PS to Vice Chairman, NITI Aayog
2. Sr. PPS to CEO, NITI Aayog
3. PS to Member (VKS), NITI Aayog
4. PS to Additional Secretary (Energy), NITI Aayog
5. PA to Joint Adviser (Energy)/Joint Adviser (Coal)/Joint Adviser (MNRE & PNG)

Annexure-I

List of Participant

S. No.	Name	Designation	Organization
1.	Sh. R.P. Gupta	Additional Secretary (Energy)	NITI Aayog
2	Sh. Rajnath Ram	Joint Adviser	NITI Aayog
3	Sh. Surinder Singh Sur	Joint Adviser	NITI Aayog
4.	Sh. Harendra Kumar	Joint Adviser	NITI Aayog
5.	Ms. Poonam Kapur	Economic Officer	NITI Aayog
6.	Sh. Ajay Mathur	DG	TERI
7.	Sh. A.K. Saxena	HoD Energy	TERI
8.	Sh. Arjit Singh Gupta	Director	BEE
9.	Ms. Renuka Kumar	Director	Ministry of Power
10.	Shri G. S. Negi	Economic Adviser	Department of Industrial Policy and Promotion
11.	Ms. Promodita Sathish	Economic Adviser	Ministry of Steel
12.	Dr. S.K. Malhotra	Agriculture Commissioner	Ministry of Agriculture
13.	Shri Anjani Kumar	Coal Controller	Coal Controller's Organization
14.	Shri Indradeep Roy Chowdhury	Dy. Director	Coal Controller's Organization
15.	Ms. Aashima Priye	Joint Director (D&ES)	PPAC
16.	Sh. Rohit Dawar	Additional Director	PPAC
17.	Sh. Rajesh Sharma	Director	MoSPI
18.	Sh. Surendra Kumar	Joint Director	Central Statistics Office, Economic Statistics Division
19.	Ms. Shobha Sharma	Assistant Director	Central Statistics Office, Economic Statistics Division
20.	Sh. Prahlad Parihar	Chief Engineer (PDM)	CEA
21.	Sh. Ishan Sharan	Director	CEA
22.	Dr. Satish Kumar	President and Executive Director	Alliance for an Energy Efficient Economy
23.	Sh. Deepak Tiwari	Sr. Researcher	Alliance for an Energy Efficient Economy
24.	Shri Ashok Sreenivas	Senior Fellow	Prayas Energy Group
25.	Shri Srihari Dukkipati	Senior Fellow	Prayas Energy Group
26.	Shri Vaibhav Gupta	Senior Programme Lead	Council on Energy, Environment and Water
27.	Ms. Celine Rouquette	Chief Analyst of Word Energy Outlook	IEA
28.	Sh. Sidhharth Singh	Lead Analyst	IEA

No. P-11011/3/2017-Energy
(NITI Aayog)
(Energy, Climate Change & Overseas Engagements)

NITI Aayog, Sansad Marg,
New Delhi-110001.

Dated: 13th June, 2018.

Office Memorandum

Subject: Constitution of sub-group on agriculture sector for energy data management.

The undersigned is directed to refer to the minutes of first meeting of the working group on demand (consumption) side energy data management held on 04th June, 2018 in NITI Aayog (copy enclosed). As per para 15 to 18 of the said minutes of meeting, working group has constituted sub-group on agriculture sector for demand side energy data management with following composition:

1.	Joint Secretary, Ministry of Agriculture	Chairman
2.	Shri Pankaj Batra, Member (Planning), Central Electricity Authority	Member
3.	Sh. Abhay Bakre, Director General, Bureau of Energy Efficiency	Member
4.	Dr. Ajay Mathur, Director General, TERI	Member
5.	Ms Atreyee Das, Director General, Petroleum Planning & Analysis Cell	Member
6.	Ms. G. S. Lakshmi, DDG, Ministry of Statistic and Program Implementation	Member
7.	Shri Surinder Singh Sur, Joint Adviser, NITI Aayog	Member convener
8.	Shri Ashok Sreenivas/ Shri Srihari Dukkipati , Senior Fellow, Prayas Energy Group	Member
9.	Dr. Satish Kumar, AEEE	Member

3. Sub-group may also co-opt (as member) any Central/ State Government Official/ Expert/ Think-tank, if required. The communication detail of the EIA and IEA is given below. Sub-group may contact them to fulfil the direction given by working group under para 15 (b) & 18 of the minutes of the meeting held on 04th June, 2018.

- Shri Nanda Srinivasan, Statistical Method Experts, 1000, Independence Ave, SW, Washington, DC-20585, Ph. No.: 202-586-7777, E-mail Id: nanda.srinivasan@eia.gov
- Mr Duncan Millard, Chief Statistician, IEA, 31-35 rue de la Federation, 75739 Paris Cedex 15, France. E-mail id: Duncan.MILLARD@iea.org.
- Ms. Celine Rouquette, IEA, E-mail Id: Celine.ROUQUETTE@iea.org,
- Mr. Bruce MURPHY, IEA, E-mail Id: Bruce.MURPHY@iea.org,
- Mr. Siddharth Singh, IEA (Lead Analyst, Indian), E-mail Id: s_singh@outlook.com

4. Sub-group is required to complete the work and submit the report in six months with its findings in reference to the terms of reference specified. The sub-group will meet once in a month and submit its report to NITI Aayog. Terms of reference of sub-group is given below:

- To workout energy related data required for agriculture sector.
- Data to include not only irrigation related data (electric, diesel and solar pumps) but also farm implements (tractors, harvesters, sowers etc.).
- To identify the data source, frequency and format in which it is available, and identify a means to make such data available in public domain in an easy to access form.
- To identify the energy data gaps. This would cover data related to fuel-wise quantity of energy, efficiency, price and so on.
- To identify each data item that is not presently available, classify it as either easy to get or hard to get.
- For each easy to get data item, develop a roadmap for how the data can be collected, validated and published.
- For each data item that is hard to get, identify the primary reasons / barriers for why it is hard and possible ways of working for collection.
- To develop uniform formats for data collection in the energy sector for energy data management agencies and remove redundancy if any.
- To create online real time data collection and data sharing platform in between different energy data management agencies.
- Any other ToR decided by the sub-group.

5. Joint Adviser (Energy) (Member Convener), NITI Aayog is requested to communicate above office memorandum to the all Members of the sub-group and convene the first meeting of the sub-group at earliest. Ministry of Agriculture has been requested by NITI Aayog separately to nominate Joint Secretary from the Ministry to chair the sub-group.

This issues with the approval of competent authority.

(Manoj Kumar Upadhyay),
Deputy Adviser,
Telephone: 011-23096757.

21.6.18

O/C

To,

1. **Shri Surinder Singh Sur, Joint Adviser, NITI Aayog**

Copy to:-

1. **Shri S. K. Pattanayak, Secretary, Ministry of Agriculture, Krishi Bhawan, New Delhi-110001, Tele:23382651, Email: sec-agri@gov.in**
2. **Shri Pankaj Batra, Member (Planning), Central Electricity Authority, Sewa Bhawan, R. K. Puram, Sector-1, New Delhi - 110 066. Ph. No.: 011-26732202, E-mail Id: memberplanning@gov.in, pan_batra@nic.in**
3. **Sh. Abhay Bakre, Director General, Bureau of Energy Efficiency, 4th Floor, Sewa Bhawan, R. K. Puram, New Delhi – 110066. Ph. No.: 011-26178316/26178328, Email id: dg-bee@nic.in**

4. Shri Ajay Mathur, Director General, The Energy and Resources Institute, Darbari Seth Block, I H C Complex, Lodhi Road, New Delhi-110003. Ph. No. 011-24682151, E-mail id: dg@teri.res.in
5. Ms. Atreyee Das, Director General, Petroleum Planning & Analysis Cell (PPAC), 2nd Floor, Core-8, SCOPE Complex-7 Institutional Area, Lodhi Road, New Delhi - 110003. Telephone: 011-24306191/92, E-mail id: webadm@ppac.gov.in
6. Ms. G.S. Lakshmi, DDG, Ministry of Statistic and Program Implementation, Room No.413, Level –IV, East Block 6, R.K.Puram, Sec-I, New Delhi-110066. Ph. No.: 26188462, E-mail Id: lakshmi.g@nic.in
7. Dr. Satish Kumar, President and Executive Director, Alliance for an Energy Efficient Economy, 4th Floor,Saira Tower, Gulmohar Enclave, Yusuf Sarai, New Delhi-49, Email Id: satish@aeee.in
8. Shri Ashok Sreenivas/ Shri Srihari Dukkipati, Senior Fellow, Prayas Energy Group, Unit III A & B, Devgiri, Joshi Railway Museum lane, Kothrud Industrial Area, Kothrud, Pune, MH 411038. Telephone: 91-20-25420720, E-mail id: ashok@prayaspune.org & srihari@prayaspune.org
9. Dr. S.K. Malhotra, Agriculture Commissioner, Ministry of Agriculture, Room No 231, Krishi Bhawan, New Delhi-110001. Telephone: 011-23383549, E-mail: ag.comm@nic.in

No. P-11011/3/2017-Energy
(NITI Aayog)
(Energy, Climate Change & Overseas Engagements)

NITI Aayog, Sansad Marg,
New Delhi-110001.

Dated: 30th July, 2018.

Office Memorandum

Subject: Constitution of sub-group on agriculture sector for energy data management.

The undersigned is directed to inform that subgroup has co-opted Dr. Kanchan Kumar Singh, ADG (Ag. Eng.) ICAR, Sh. VN Kale, Additional Commissioner M& T and Sh. Pankaj Tyagi, Director RFS as member of the subgroup during first meeting of subgroup held on 20.07.2018. The revised composition of the subgroup is as follows:

1.	Dr. S.K. Malhotra, Agriculture Commissioner, Ministry of Agriculture & Farmers Welfare	Chairman
2.	Dr. Kanchan Kumar Singh, ADG (Ag. Eng.) ICAR	Member
3.	Sh. VN Kale, Additional Commissioner M& T	Member
4.	Shri Prahlad, Chief Engineer, Central Electricity Authority	Member
5.	Sh. Arjit Sengupta, Director , Bureau of Energy Efficiency	Member
6.	Sh. A.K. Saxena, Director , TERI	Member
7.	Ms. Bhawna Singh, Director , Ministry of Statistic and Program Implementation	Member
8.	Sh. Pankaj Tyagi, Director RFS	Member
9.	Shri Surinder Singh Sur, Joint Adviser, NITI Aayog	Member convener
10.	Sh. Shyam Gupta, Joint Director , Petroleum Planning & Analysis Cell	Member
11.	Shri Ashok Sreenivas/ Shri Srihari Dukkipati , Senior Fellow, Prayas Energy Group	Member
12	Dr. Satish Kumar, AEEE	Member

30.7.18

जारी
ISSUED

O/C

(Manoj Kumar Upadhyay),
Deputy Adviser,
Telephone: 011-23096757.

1. **Dr. S.K. Malhotra, Agriculture Commissioner, Ministry of Agriculture, Room No 231, Krishi Bhawan, New Delhi-110001. Telephone: 011-23383549, E-mail: ag.comm@nic.in**

2. Dr. Kanchan Kumar Singh, ADG (Ag. Eng.), Room No. 405 KAB II, ICAR, Indian Council of Agricultural Research, Krishi Bhavan, Dr. Rajendra Prasad Road, New Delhi-110001. Email: kanchansingh044@gmail.com, Mobile: 9582963548, Phone: 011-25840158.
3. Shri V.N. Kale, Additional Commissioner, Ministry of Agriculture, Department of Agriculture, Cooperation and Farmers' Welfare, Room No. 298, Krishi Bhawan, New Delhi-110001. Telephone No.: 23387200, E-mail Id: vn.kale@nic.in
4. Sh. Prahlad, Chief Engineer, PDM, Central Electricity Authority, Sewa Bhawan, R. K. Puram, Sector-1, New Delhi - 110066. Ph. No.: 9968487810, E-mail id: prahlad_only@rediffmail.com.
5. Sh. Arjit Sengupta, Director, Bureau of Energy Efficiency, 4th Floor, Sewa Bhawan, R. K. Puram, New Delhi – 110066. E-mail id: asengupta@beenet.in Ph. No. 9999210344
6. Sh. A.K. Saxena, Director, The Energy and Resources Institute, Darbari Seth Block, I H C Complex, Lodhi Road, New Delhi-110003. Ph. No. 9654366166, E-mail id: ak.saxena@teri.res.in.
7. Ms. Bhawna Singh, Director, Ministry of Statistic and Program Implementation, East Block 6, R.K.Puram, Sec-I, New Delhi-110066. E-mail Id: bhawna.75@nic.in, Ph. No. 9711717804
8. Shri Pankaj Tyagi, Director (NRM), Ministry of Agriculture, Department of Agriculture, Cooperation and Farmers' Welfare, Room No. 299-B, Krishi Bhawan, New Delhi-110001. Telephone No.: 23389714, E-mail Id: pankaj.tyagi99@gov.in
9. Sh. Shyam Gupta, Joint Director, Petroleum Planning & Analysis Cell (PPAC), 2nd Floor, Core-8, SCOPE Complex-7 Institutional Area, Lodhi Road, New Delhi - 110003. E-mail id: sgupta@ppac.gov.in, Ph. No.: 9968687640.
10. Sh. Deepak Tiwari, Sr. Research Associate, Alliance for an Energy Efficient Economy, 4th Floor, Saira Tower, Gulmohar Enclave, Yusuf Sarai, New Delhi-49. E-mail Id: deepak@aeee.in, satish@aeee.in, Ph. No.: 9873867734.
11. Shri Ashok Sreenivas/ Shri Srihari Dukkipati, Senior Fellow, Prayas Energy Group, Unit III A & B, Devgiri, Joshi Railway Museum lane, Kothrud Industrial Area, Kothrud, Pune, MH 411038. Telephone: 91-20-25420720, E-mail id: ashok@prayaspune.org & srihari@prayaspune.org

Copy to:-

1. Sh. Surinder Singh Sur, Joint Adviser, NITI Aayog.

No. I-22/2/37/2018-P&E
NITI Aayog/नीति आयोग
Government of India/भारत सरकार
(Energy and International Cooperation Vertical)
(ऊर्जा और अंतर्राष्ट्रीय सहयोग वर्टिकल)

नीति आयोग, संसद मार्ग
नई दिल्ली-110001
दिनाँक:- 09 अगस्त, 2018

Office Memorandum/कार्यालयज्ञापन

Subject: Minutes of the first meeting of the sub-group on demand side energy data managementfor agriculture sector.

विषय: कृषि क्षेत्र ऊर्जा डेटा प्रबंधन पर उप-समूह की पहली बैठक के मिनट।

A list of participants is at Annexure-I.

2. First meeting of the sub-group on demand side energy data management for agriculture sectorwas held in NITI Aayog on 20th July, 2018 under Chairmanship of Agriculture Commissioner, Ministry of Agriculture & Farmers Welfare. At the outset, Chairman of the sub-group Dr. S. K. Malhotra, welcomed all participants.
He referred minutes of the meeting of the working groupon the demand side energy data management (held on 4th June, 2018 in NITI Aayog) and stated that the sub-group on demand side energy data management for agriculture sector is being constituted for identifying agriculturesector energy consumption data and its gap, frequency & source of data collection and updating them on real time basis for making agriculture sector energy consumption data available to public, private, think-tank and third sectors for policy formulation, research etc.

3. Sh. Surinder Singh Sur, Joint Adviser (Energy), NITI Aayog&convener of the sub-group gave presentation on the finding of the working group. He also stated followings regarding formation of sub-group on demand side energy data management for agriculture sector, as per first meeting minutes of working group on demand side energy data management:

a) Sub-groups shall explore the best practices being followed internationally including by Energy Information Agency (EIA) of USA and IEA for the kind of data which is being collected and the modes of collection in the energy sector.
b) The sub-groups shall also identify the data being collected by different agencies currently in India and the mode & frequency of such collection. The sub-group shall then deliberate if the frequency needs to be increased and if better mode can be suggested keeping in view the cost and quality of data.
c) For the data gap which is identified, it should be explored how this is being done in other countries, what will be best method to collect it here. In this context, the current statutory provisions available in the Collection of Statistics Act, Energy Efficiency Act and various other statutory instruments may be explored. The sub-group may also suggest, if needed and current statutory provisions are not adequate, to enact a new statutory framework.

d) The sub-group, for the purpose of data collection shall keep in mind the various implements/sectors/modes using energy in the sector, different forms of energies being used and data pertaining to efficiency and cost.

e) Sub-group is required to complete the work and submit the report in six months with its findings in reference to the terms of reference specified. The sub-group will meet once in a month and submit its report to NITI Aayog.

4. In addition to above, convener of the sub-group presented following format (as reference) which is based on International Energy Agency (IEA) for agriculture sector energy consumption data collection:

Energy Source	Volumetric Consumption	Energy Consumption (TWh)	Used in Farm Machinery	Used in Agriculture Appliances	Frequency of data collection
Oil & Petroleum Products					
Natural Gas					
Coal & Coal Products					
Renewables Energy					
Electricity					
Other					
Total Energy Use (TWh)					

5. The above format was discussed and deliberated during meeting. Based on above format and input from members of the sub-group, a draft format for composite data for agriculture, irrigation & machinery was drafted during meeting which is placed at **Annexure-II**.

6. Based on **Annexure-II**, the Chairman of the sub-group decided to form a group including sub-group members from AEEE and MoSPI headed by member from BEE to examine and finalize format for exact agriculture sector energy consumption data requirement, gap in the data, source & frequency of the data, process of collection of data and method for making them publically available on real time basis, before next sub-group meeting.

7. After detailed discussion sub-group decided to co-opt Sh. VN Kale, Additional Commissioner M& T, Dr. Kanchan Kumar Singh, ADG (Ag. Eng.) ICAR and Sh. Pankaj Tyagi, Director RFS as a member of the sub-group. The Chairman of the sub-group also decided to co-opt Dr. Huma Naz, Research Associate, Ministry of Agriculture & Farmers Welfare, who will draft report for sub-group for presenting it to the working group. Dr. Huma Naz will also interact with members of the sub-group and divisions of Agriculture Ministry and its subordinate officesfor collecting information for drafting report and finalization of the data formats. The sub-group decided that second meeting of the sub-group will be held in the third week of August, 2018.

8. The meeting ended with the vote of thanks to the chair.

This issues with approval of Chairman of the Sub-group

जारी
ISSUED
09.08.18

O/C

(मनोज कुमार उपाध्याय)
(Manoj Kumar Upadhyay),
Deputy Adviser,
Tele: 23042422.

To,

1. **Dr. S.K. Malhotra, Agriculture Commissioner, Ministry of Agriculture, Room No 231, Krishi Bhawan, New Delhi-110001. Telephone: 011-23383549, E-mail: ag.comm@nic.in**
2. **Dr. Kanchan Kumar Singh, ADG (Ag. Eng.), Room No. 405 KAB II, ICAR, Indian Council of Agricultural Research, Krishi Bhavan, Dr. Rajendra Prasad Road, New Delhi-110001. Email: kanchansingh044@gmail.com, Mobile: 9582963548, Phone: 011-25840158.**
3. **Shri V.N. Kale, Additional Commissioner, Ministry of Agriculture, Department of Agriculture, Cooperation and Farmers' Welfare, Room No. 298, Krishi Bhawan, New Delhi-110001. Telephone No.: 23387200, E-mail Id: vn.kale@nic.in**
4. **Sh. Prahlad, Chief Engineer, PDM, Central Electricity Authority, Sewa Bhawan, R. K. Puram, Sector-1, New Delhi - 110066. Ph. No.: 9968487810, E-mail id: prahlad_only@rediffmail.com.**
5. **Sh. Arjit Sengupta, Director, Bureau of Energy Efficiency, 4th Floor, Sewa Bhawan, R. K. Puram, New Delhi – 110066. E-mail id: asengupta@beenet.in Ph. No. 9999210344**
6. **Sh. A.K. Saxena, Director, The Energy and Resources Institute, Darbari Seth Block, I H C Complex, Lodhi Road, New Delhi-110003. Ph. No. 9654366166, E-mail id: ak.saxena@teri.res.in.**
7. **Ms. Bhawna Singh, Director, Ministry of Statistic and Program Implementation, East Block 6, R.K.Puram, Sec-I, New Delhi-110066. E-mail Id: bhawna.75@nic.in, Ph. No. 9711717804**
8. **Shri Pankaj Tyagi, Director (NRM), Ministry of Agriculture, Department of Agriculture, Cooperation and Farmers' Welfare, Room No. 299-B, Krishi Bhawan, New Delhi-110001. Telephone No.: 23389714, E-mail Id: pankaj.tyagi99@gov.in**
9. **Sh. Shyam Gupta, Joint Director, Petroleum Planning & Analysis Cell (PPAC), 2nd Floor, Core-8, SCOPE Complex-7 Institutional Area, Lodhi Road, New Delhi - 110003. E-mail id: sgupta@ppac.gov.in, Ph. No.: 9968687640.**
10. **Sh. Deepak Tiwari, Sr. Research Associate, Alliance for an Energy Efficient Economy, 4th Floor, Saira Tower, Gulmohar Enclave, Yusuf Sarai, New Delhi-49. E-mail Id: deepak@aeee.in, satish@aeee.in, Ph. No.: 9873867734.**

11. **Shri Ashok Sreenivas/ Shri Srihari Dukkipati, Senior Fellow, Prayas Energy Group, Unit III A & B, Devgiri, Joshi Railway Museum lane, Kothrud Industrial Area, Kothrud, Pune, MH 411038. Telephone: 91-20-25420720, E-mail id: ashok@prayaspune.org & srihari@prayaspune.org**
12. **Dr. Huma Naz, Research Associate, Room No. 229-A, Department of Agriculture, Ministry of Agriculture & Farmers Welfare, Krishi Bhawan, New Delhi-110001.**

Copy to:-

1. **PS to Vice-Chairman, NITI Aayog.**
2. **PPS to CEO, NITI Aayog.**
3. **PS to Member (VKS), NITI Aayog.**
4. **PS to Additional Secretary (Energy), NITI Aayog.**
5. **PA to Joint Adviser (Energy)/(Coal)/(MNRE).**
6. **PA to Dy. Adviser (Chemical).**

Annexure-I

List of Participant

S. No.	Name	Designation	Organization	E-mail Id	Contact No.
1.	Dr. Suresh Kumar Malhotra	Agriculture Commissioner	Ministry of Agriculture	agricommissioner@gmail.com	9968978191
2.	Sh. Pankaj Tyagi	Director	Ministry of Agriculture	pankaj.tyagi99@gov.in	23389714
3	Sh. Prahlad	Chief Engineer, PDM	CEA	prahlad_only@rediffmail.com	9968487810
4.	Sh. Arjit Sengupta	Director	BEE	asengupta@beenet.in	9999210344
5.	Sh. Kishore Kumar	Senior Associate	BEE	punkishore@beenet.in	8285199852
6.	Sh. Sumit Mudgal	Project Engineer	BEE	sumit.mudgal@beenet.in	8800335407
7.	Ms. Bhawna Singh	Director	MOSPI	bhawna.75@nic.in	9711717804
8.	Ms. Shobha Sharma	Assistant Director	MOSPI	shobha.sharma@gov.in	9660767002
9.	Sh. Surinder Singh Sur	Joint Adviser	NITI Aayog	ssingh-pc@nic.in	23096545
10.	Sh. Harendra Kumar	Joint Adviser	NITI Aayog	kumar.harendra@nic.in	-
11.	Sh. Manoj Kumar Upadhyay	Deputy Adviser	NITI Aayog	mk.upadhyay@nic.in	9971131218
12.	Ms. Poonam Kapur	Economic Officer	NITI Aayog	poonam.kapur@nic.in	9990888997
13.	Ms. Aashima Priye	Joint Director	PPAC	aashima.priye@ppac.gov.in	7506933410
14.	Sh. Shyam Gupta	Joint Director	PPAC	sgupta@ppac.gov.in	9968687640
15.	Sh. Deepak Tiwari	Sr. Research Associate	AEEE	deepak@aeee.in	9873867734

A. Composite Agriculture Data

Annexure-II

TYPE OF FUEL	Agricuture															
		irrigation					Machinery					Others				
	Sub category	Source	Volume	conversion unit	Ktoe	Frequency	Source	Volume	conversion unit	Ktoe	Frequency	Source	Volume	conversion unit	Ktoe	Frequency
OIL	Diesal															
(M. Tonne)	LDO															
	Furnance Oil															
	HSD															
	Others															
Natural gas (BCM)																
Electricity	Grid connected															
(KWh)	others															
Renewable	Solar															
(KWh)	Wind															
	others															
Total (Ktoe)																

B. Irrigation Data

TYPE OF FUEL		Irrigation																															
		Cannal lift						tubewell						ponds/well						micro irrigation						Others									
		Total Number	Source	Volume	conversion unit	Ktoe	Frequency	Total Numbers	Source	Volume	conversion unit	Ktoe	Frequency	Total Numbers	Source	Volume	conversion unit	Ktoe	Frequency	Source	Total Numbers	Volume	drip irrigation conversion unit	Ktoe	sprinkler Frequency	Total Numbers	Source	Volume	conversion unit	Ktoe	Frequency				
	Sub category																																
OIL	Diesal																																
(m.Tonne)	LDO																																
	Furnance Oil																																
	HSD																																
	Others																																
Natural gas (BCM)																																	
Electricity	Grid connected																																
(KWh)	others																																
Renewable	Solar																																
(KWh)	Wind																																
	others																																
Total (Ktoe)																																	

C. Machinary Data

TYPE OF FUEL		Machinary																															
		Tractors						Planters						Weeders						Spray Devices						Others					
		Total Number	Source	Volume	conversion unit	Ktoe	Frequency	Total Numbers	Source	Volume	conversion unit	Ktoe	Frequency	Total Numbers	Source	Volume	conversion unit	Ktoe	Frequency	Source	Total Numbers	Volume	conversion unit	Ktoe	Frequency	Total Numbers	Source	Volume	conversion unit	Ktoe	Frequency
	Sub category																																
OIL	Diesal																																
M.tonne	LDO																																
	Furnance Oil																																
	HSD																																
	Others																																
Natural gas (BCM)																																	
Electricity(KWh)	Grid connected																																
	others																																
Renewable(Kwh)	Solar																																
	Wind																																
	others																																
Total(Ktoe)																																	

No. I-22/2/37/2018-P&E
NITI Aayog/नीति आयोग
Government of India/भारत सरकार
(Energy and International Cooperation Vertical)
(ऊर्जा और अंतर्राष्ट्रीय सहयोग वर्टिकल)

नीति आयोग, संसद मार्ग
नई दिल्ली-110001
दिनाँक:- 10 सितंबर, 2018

Office Memorandum/कार्यालय ज्ञापन

Subject: Minutes of the second meeting of the Sub-group on Agriculture Sector energy data management.

विषय: कृषि क्षेत्र ऊर्जा डेटा प्रबंधन पर उप-समूह की दूसरी बैठक के मिनट।

A list of participant is at Annexure-I.

2. Second meeting of the sub-group on agriculture sector energy data management was held in NITI Aayog on 5th Sept, 2018 under Chairmanship of Dr. Suresh K. Malhotra Agriculture Commissioner, Ministry of Agriculture & Farmers Welfare. At the outset, he welcomed all participants and expressed that demand side energy requirement assessment as such not available, but on the basis of data available on area coverage during kharif and rabi season it is possible to make calculations on the basis of average number of ploughings to be made for field preparation of different crops and requirement of fuel for tractor and power tillers could be worked out accordingly. Ministry of Agriculture & FW regularly maintains such area coverage data crop wise as well as state wise which could be appreciably utilized. He referred minutes of the first meeting of the sub-group on the agriculture sector energy data management and reviewed following decisions taken in last meeting:

- Finalization of the draft format for composite data for agriculture, irrigation & machinery, drafted during first meeting (Annexure-II).

- Co-opting Dr. Kanchan Kumar Singh, ADG (Ag. Eng.), ICAR, Shri V.N. Kale, Additional Commissioner, Shri Pankaj Tyagi, Director (NRM) Ministry of Agriculture, Department of Agriculture, Cooperation and Farmers as a member of the sub-group.

3. Sh. Surinder Singh Sur, Joint Adviser (Energy), NITI Aayog informed that all the member suggested during first meeting were co-opted. These member were present in the meeting. Further, he informed to sub-group that Sh. Deepak Tiwari, Sr. Research Associate, Alliance for an Energy Efficient Economy has requested through email to exclude him as a member of the sub-group owing limited knowledge on the subject. The sub-group agreed to exclude his name from the sub-group.

4. Sub-group reviewed the finalization of the draft format for composite data for agriculture, irrigation & machinery, drafted during first meeting. Draft format was displayed on screen for discussion and following observation has been made by sub-group members:

- Sub-group members accepted the methodology adopted for preparation of the composite agriculture sector energy data sheet (Annexed ppt) for agriculture, irrigation & machinery.

- Members suggested to prepare State wise data sheet for better capturing of the data.

- Members also suggested to replace number of ploughing by number of operation in Table 3 of the data sheet, divide combined harvester action into combined harvester, reaper and thrashers in Table 5 of the data.

- Classification of fuel wise irrigation source like Tubewell/well- diesel/solar power/electricity/etc.

- PPAC was requested to provide DG set number used for irrigation purpose.

- CEA was requested to provide data of number of pumps set used for irrigation purpose.

5. After detailed discussion on the availability of the solar pump data, machinery related data like tractor, harvester, power tillers, others (Weeders, Power sprayer etc), Chairman requested for providing state wise data along with calculation procedures for energy requirements. Irrigation related data like canals, tanks, wells, and tube wells etc. were also discussed and it was appraised that wells, tube wells are mostly run on electricity rather than diesel and solar power. It was also mentioned that canal water is mostly used through open irrigation for application in field without using any energy. Chairman requested Dr. Kanchan Kumar Singh, ADG (Ag. Eng.) from ICAR and Shri V.N. Kale, Additional Commissioner from Ministry of Agriculture for providing details state wise /crop wise ploughed by tractor and other means such as power tillers, where there is energy consumption. Chairman expressed that energy might be consumed in certain areas for lifting water from canals, tanks and ponds and such information need to be explored from Ministry of Water Resources state wise and if possible crop wise also. If needed, states could be requested for providing such information.

6. Sub-group proposed to hold a meeting with Central Institute of Agricultural Engineering (CIAE), Bhopal for understanding mechanization of agriculture sector, use of different machines in the agriculture sector and energy data availability related to machines used in agriculture sector. Accordingly, the meeting is proposed to be held by 30th Sept, 2018. Dr. Kanchan Kumar Singh, ADG (Ag. Eng.) from ICAR agreed to coordinate the meeting at CIAE, Bhopal.

7. The Chairman of the sub-group was of the view to hold two more consultative meeting excluding CIAE, Bhopal before finalization of the sub-group report. Therefore, sub-group agree to hold two more meeting by 15 Oct, 2018.

8. The meeting ended with the vote of thanks to the chair.

This issues with the approval of the Chairman of the sub-group.

Kapur

(पूनम कपूर),
(Poonam Kapur),
आर्थिक अधिकारी,
Economic Officer,
Telephone: /दूरभाषा न.-23042348

To,

1. **Dr. S.K. Malhotra, Agriculture Commissioner, Ministry of Agriculture, Room No 231, Krishi Bhawan, New Delhi-110001. Telephone: 011-23383549, E-mail: ag.comm@nic.in**

2. Dr. Kanchan Kumar Singh, ADG (Ag. Eng.), Room No. 405 KAB II, ICAR, Indian Council of Agricultural Research, Pusha Road, New Delhi-110060. Email: kanchansingh044@gmail.com, Mobile: 9582963548, Phone: 011-25840158.
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11. Shri Ashok Sreenivas/ Shri Srihari Dukkipati, Senior Fellow, Prayas Energy Group, Unit III A & B, Devgiri, Joshi Railway Museum lane, Kothrud Industrial Area, Kothrud, Pune, MH 411038. Telephone: 91-20-25420720, E-mail id: ashok@prayaspune.org & srihari@prayaspune.org

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2. PPS to CEO, NITI Aayog.
3. PS to Member (VKS), NITI Aayog.
4. PS to Additional Secretary (Energy), NITI Aayog.
5. PA to Joint Adviser (Energy)/(Coal)/(MNRE).
6. PA to Dy. Adviser (Chemical).

Annexure-I

List of Participant

S. No.	Name	Designation	Organization	E-mail Id	Contact No.
1.	Dr. Suresh Kumar Malhotra	Agriculture Commissioner	Ministry of Agriculture	agricommissioner@gmail.com	9968978191
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4.	Sh. Arjit Sengupta	Director	BEE	asengupta@beenet.in	9999210344
5.	Sh. Sumit Mudgal	Project Engineer	BEE	sumit.mudgal@beenet.in	8800335407
6.	Sh. Ashish Sharma	Research Associate	TERI	ashish.sharma1@teri.res.in	9711423310
7.	Ms. Bhawna Singh	Director	MOSPI	bhawna.75@nic.in	9711717804
8.	Sh. Surinder Singh Sur	Joint Adviser	NITI Aayog	ssingh-pc@nic.in	23096545
9.	Sh. Manoj Kumar Upadhyay	Deputy Adviser	NITI Aayog	mk.upadhyay@nic.in	9971131218
10.	Ms. Poonam Kapur	Economic Officer	NITI Aayog	poonam.kapur@nic.in	9990888997
11.	Shri V.N. Kale	Additional Commissioner	Ministry of Agriculture	vn.kale@nic.in	9891692897
12.	Dr. Huma Naz	Research Associate	DAC&FW	humanaz83@gmail.com	9557697271

No. I-22/2/37/2018-P&E
NITI Aayog/नीति आयोग
Government of India/भारत सरकार
(Energy and International Cooperation Vertical)
(ऊर्जा और अंतर्राष्ट्रीय सहयोग वर्टिकल)

नीति आयोग, संसद मार्ग
नई दिल्ली-110001
दिनाँक:- 12th नवंबर, 2018

Office Memorandum/कार्यालय ज्ञापन

Subject: Minutes of the third meeting of the Sub-group on Agriculture Sector energy data management.

विषय: कृषि क्षेत्र ऊर्जा डेटा प्रबंधन पर उप-समूह की तृतीय बैठक के मिनट।

A list of participant is at Annexure-I.

2. Third meeting of the sub-group on agriculture sector energy data management was held in NITI Aayog on 11th October, 2018 under the Chairmanship of Dr. Suresh Kumar Malhotra Agriculture Commissioner, Ministry of Agriculture & Farmers Welfare. At the outset, he welcomed all participants and stated that the formats & methodology for energy data management of agriculture machineries was finalized during second meeting. The discussion of this meeting will focus on formats & methodology for energy data management of irrigation. He referred minutes of the second meeting of the sub-group on the agriculture sector energy data management and reviewed following decisions taken in last meeting:

- Classification of fuel wise irrigation source like Tubewell/well- diesel/solar power/electricity/etc.
- Status of DG set number used for irrigation purpose to be provide by PPAC.
- Number of pumps set used for irrigation purpose to be provided by CEA.

3. Sh. Manoj Kumar Upadhyay, Deputy Adviser, NITI Aayog informed that classification of fuel wise irrigation source like Tubewell/well-diesel/solar/power/electricity has been done and will be presented in this meeting. He informed that pump set data has been shared by CEA to all member of the sub-group. Further, he stated that Shri Pankaj Tyagi, Director (NRM) has send an e-mail. In this e-mail he informed that NRM/RFS Division of the Department of Agriculture, Cooperation & Farmers' Welfare is not directly receiving any energy data management. Therefore, it was requested to exclude him from the sub-group on agriculture sector for energy data management. The sub-group accepted his request.

4. Representative of PPAC informed that PPAC does not have DG set data used for irrigation purpose. However, he informed that methodology of diesel demand calculation has been discussed with Dr. Huma Naz. The fitment factor for calculation was also discussed in the meeting.

5. After that a brief presentation on format for energy data management of irrigation was made by Shri Manoj Kumar Upadhyay, Deputy Adviser, NITI Aayog. During presentation following observation has been made by sub-group members:

- Sub-group suggested that CEA should provide methodology for pump set data collection. It should clarify that pump set data collected by them includes solar pump or not. CEA needs to give presentation on pump set data.
- TERI will examine the methodology & format for solar pump set data collection. For this task, Shri V.N. Kale, Additional Commissioner will provide data and help them to estimate the number and projection trajectory. TERI may also include solar pump set scheme of MNRE and consult with MNRE.
- It was suggested that sub-group should consult State Government about classification of their irrigation system especially A.P, T.N and Maharashtra and water use patter in different irrigation system.
- Sub-group also suggested to consult Jain irrigation for data on micro-irrigation i.e. sprinkler irrigation, drip irrigation, solar pump irrigation etc.
- It was stated that total irrigated area under micro-irrigation is 11.7 million hectare out of that 50% is sprinkler irrigation and 50% is drip irrigation. State-wise data on area coverage under drip and sprinkler system may be collected from National Committee on Plasticulture Agriculture (NCPAH) for energy requirement calculation.
- Sub-group also suggested to study Pradhan Mantri Krishi Sichaai Yojan (प्रधान मंत्री कृषि सिचाई योजना) to finalize the format.

4. The meeting ended with the vote of thanks to the chair.

This issues with the approval of the Chairman of the sub-group.

(मनोज कुमार उपाध्याय)
(Manoj Kumar Upadhyay)
Deputy Adviser
उप सलाहकार
Telephone: /दूरभाषा न.-23042422

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2. PPS to CEO, NITI Aayog.
3. PS to Member (VKS), NITI Aayog.
4. PS to Additional Secretary (Energy), NITI Aayog.
5. PA to Joint Adviser (Energy)/(Coal)/(MNRE).
6. PA to Dy. Adviser (Chemical).

Annexure-I

List of Participant

S. No.	Name	Designation	Organization	E-mail Id	Contact No.
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4.	Sh. Arjit Sengupta	Director	BEE	asengupta@beenet.in	9999210344
5.	Sh. Sumit Mudgal	Project Engineer	BEE	sumit.mudgal@beenet.in	8800335407
6.	Sh. Ashish Sharma	Research Associate	TERI	ashish.sharma1@teri.res.in	9711423310
9.	Sh. Manoj Kumar Upadhyay	Deputy Adviser	NITI Aayog	mk.upadhyay@nic.in	9971131218
10.	Ms. Poonam Kapur	Economic Officer	NITI Aayog	poonam.kapur@nic.in	9990888997
11.	Shri V.N. Kale	Additional Commissioner	Ministry of Agriculture	vn.kale@nic.in	9891692897
12.	Sh. Shyam Gupta	Jt. Director	PPAC	sgupta@ppac.gov.in	9968687640
13.	Sh. Aashima Priye	Jt. Director	PPAC	aashima.priye@ppac.gov.in	7506933410
14.	Dr. Huma Naz	Research Associate	DAC&FW	humanaz83@gmail.com	9557697271

No. I-22/2/37/2018-P&E
Government of India/भारत सरकार
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(ऊर्जा और अंतर्राष्ट्रीय सहयोग वर्टिकल)

नीति आयोग, संसद मार्ग
नई दिल्ली-110001

दिनाँक:- 17th जनवरी, 2019

Office Memorandum/कार्यालय ज्ञापन

Subject: Minutes of the fourth meeting of the Sub-group on Agriculture Sector energy data management.
विषय: कृषि क्षेत्र ऊर्जा डेटा प्रबंधन पर उप-समूह की चतुर्थ बैठक के मिनट।

A list of participant is at Annexure-I.

2. Fourth meeting of the sub-group on agriculture sector energy data management was held in NITI Aayog on 4th January, 2019 under the Chairmanship of Shri R. P. Gupta, Additional Secretary (Energy), NITI Aayog. At the outset, Sh. Surinder Singh Sur, Adviser (Energy), NITI Aayog welcomed all participants and stated that the formats & methodology for energy data management of agriculture was finalized during third meeting and various tables were prepared to identify the existing gaps in data collection.

3. The meeting started by the presentation prepared by Ministry of Agriculture on the formats for data collection of different agricultural areas to which Shri R.P. Gupta showed his satisfaction and said that good amount of work has been done by the sub-group. Further, he had following recommendations for the sub-group:

a) A large portion of area is being ploughed manually or by bullocks rather than machines, which should be considered while collecting data to assess the actual amount of energy being consumed in ploughing;
b) Along with the capturing the data on energy consumed by the agricultural machinery (both diesel and electricity), there should also be a provision to capture data on analyzing the efficiency of these machines and therefore, work on increasing their efficiency;
c) The data on energy consumed during agricultural transportation is to be captured by the sub-group on transport sector;

4. Explaining the details of the tables, Chairman of the sub-group, Shri S. K. Malhotra mentioned that the energy consumption variables used in the tables are irrigation and machinery. Elaborating on the topic, the sub-group discussed and separated the modes of irrigation that requires energy (pumps etc.) and the ones that do not consume energy (canal irrigation, rain-fed areas etc.)

5. Adding to this Shri S.K. Malhotra mentioned that it is necessary to first divide the irrigated and non-irrigated land to understand the actual irrigated area and then understanding the energy consumption of these areas.

6. The sub-group discussed the need of understanding the kind of pumps being used by the farmers, whether they are run on electricity or on DG sets in order to estimate the accurate figures on the kind of energy being consumed by the pumps. To this point, PPAC officials shared that according to survey done for 16 states, 82% of diesel sales were captured but there is still a need to segregate the information on the diesel consumes specifically for agricultural purposes.

7. Chairman of the sub-group mentioned that there should be clear bifurcation of cropped area in terms of Rabi and Kharif since one portion of area is used for both seasons sometimes, in order to get better picture of energy consumed.

8. Talking about the tanks, the sub-group discussed that several areas have a number of tanks and farm ponds installed but there is no information on the number and the type of tanks/farm ponds installed. This information needs to be captured along with a mechanism to find out the methods used for lifting water through tanks so that the calculations can be done conveniently.

9. Following suggestions were given by the sub-group for working towards bridging the gaps in Energy data of agriculture sector:

a. Evaluation of the number of tubewells running on electricity and diesel along with their respective energy consumption estimates. There should be calculations on the average number of hours that each pump runs annually.
b. Comprehensive surveys to collect data on irrigation & machine matrices for which data is not available. An organization like MoSPI or NSSO should be finalized to conduct these above-mentioned surveys.
c. While preparing report the annexure of format for which data is not available and a comprehensive survey is required for them may be place as Annexure of the report. For example; net area under irrigation by Sources (canals), net area Under Irrigation by other sources, Net area under irrigation by sources (Other wells).
d. TERI was requested to nominate official to prepare master Excel format along with assumption & methodology for data projection and coordinate with BEE which is in-charge of report writing. TERI & BEE was requested finalize report writing along with master copy of excel data formats with assumption & methodology for data projection within 15 days and circulate it all members of sub-group for their views and comments.
e. Mr. Naresh Modi, Project Director, NCPAH was requested to provide methodology of energy data collection for micro irrigation sector.

10. The meeting ended with the vote of thanks to the chair.

This issues with the approval of the Chairman of the sub-group.

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(Manoj Kumar Upadhyay)
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5. PS to Adviser (Energy), NITI Aayog
6. PA to Joint Adviser (Coal)/(MNRE).
7. PA to Dy. Adviser (Chemical).

Annexure-I

List of Participant

S. No.	Name	Designation	Organization	E-mail Id	Contact No.
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3.	Sh. Surinder Singh Sur	Adviser (Energy)	NITI Aayog		
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6.	Sh. Naresh Modi	Project Director	NCPAH	nareshmodi@ncpahindia.com	9910432892
7	Sh. Shyam Gupta	Jt. Director	PPAC	sgupta@ppac.gov.in	9968687640
8.	Sh. Aashima Priye	Jt. Director	PPAC	aashima.priye@ppac.gov.in	7506933410
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F. No. I-22/2/37/2018-P&E
Government of India/भारत सरकार
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नीति आयोग, संसद मार्ग
नई दिल्ली-110001

दिनाँक:- 27th मार्च, 2019

Office Memorandum/कार्यालय ज्ञापन

Subject: Minutes of the fifth meeting of the Sub-group on Agriculture Sector energy data management.

विषय: कृषि क्षेत्र ऊर्जा डेटा प्रबंधन पर उप-समूह की पंचम बैठक के मिनट।

A list of participant is at Annexure-I.

2. Fifth meeting of the sub-group on agriculture sector energy data management was held in NITI Aayog on 15th March, 2019 under the Chairmanship of Dr. S. K. Malhotra, Agriculture Commissioner, Ministry of Agriculture & Farmers Welfare. At the outset, Sh. Manoj Kumar Upadhyay, Deputy Adviser, NITI Aayog welcomed all participants and presented the first draft report of the sub-group along with formats and methodology for energy data management of agriculture sector. The following decisions were taken in the meeting:

a. Members of the sub-group were of the view that draft report should include write-up on additional data required to be collected in addition to the amount of data presently being collected by the concerned Ministry/ department. After assessment of the additional data requirement, the work/task of collecting the data needs to be dedicated to the various agencies/ministries. Subsequently, the approximate requirement of the fund, human resource, hardware and software etc. may be briefly indicated in the write-up.
b. The introduction para of the draft report must include all the key announcements and targets made by Prime Minister of India for agriculture sector. The draft report may also briefly highlight the targets, schemes, policies and plans for enhancing food production, coverage of irrigation, mechanism of farm sector etc from the perspective of their implication on energy sector.
c. Dr. Huma Naz, Research Associate, Ministry of Agriculture and Sh. Sumit Mudgal, Project Engineer, BEE were requested to re-visit the tables, formats and methodologies for the data collection and provide correct unit of measurement, elaborate the abbreviations, estimation and assumptions to be considered for the data. They were also requested to provide the ease to distinguish estimated data, projected data and actual data including source of the data.,
d. Further, it was found that number of several factors like number of hours of tillage by tractor, power tiller, other (weeders, power sprayer, etc.), energy capacity per pump and use of the pump (solar as well as grid connected) average hrs/day etc. were same for all States, all seasons and all crops. Therefore, it was decided that the constant number cannot be used for every State. These figures must vary based on State specific agro-climatic conditions for whichit was suggested that report on Market Research of Agriculture Pump-sets Industry of India by Shakti Foundation (https://shaktifoundation.in/wp-content/uploads/2017/10/Agriculture-Pump-Study_Report-.pdf) may be referred to underpin the appropriate numbers

e. It was suggested to consult States agriculture department for understanding the classification of other irrigation sources.

f. Shri V.N. Kale, Additional Commissioner, Ministry of Agriculture was requested to provide current data on usage of machines in the farm sector and the target by 2022, so that, the table on machine usages may be suitably calibrated and accordingly, the demand for diesel may be estimated for farm mechanization.

g. Sh. Shyam Gupta, Joint Director, PPAC and Sh. Arjit Sengupta, Director, BEE were requested to meticulously review the report, once it gets finalized after incorporating the above details. . Further, they were requested to finalize the draft report and formats along with methodology and estimation of data for energy data management in the agriculture sector in line with ToR for the sub-group.

4. The meeting ended with the vote of thanks to the chair.

This issues with the approval of the Chairman of the sub-group.

Kapur

o/c

(Poonam Kapur),
Economic Officer,
Telephone: 23042348

To,

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8. **Ms. Bhawna Singh, Director, Ministry of Statistic and Program Implementation, East Block 6, R.K.Puram, Sec-I, New Delhi-110066. E-mail Id: bhawna.75@nic.in, Ph. No. 9711717804**

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16. Dr. Huma Naz, Research Associate, Room No. 229-A, Department of Agriculture, Ministry of Agriculture & Farmers Welfare, Krishi Bhawan, New Delhi-110001.

Copy to:-

1. PS to Vice-Chairman, NITI Aayog.
2. PPS to CEO, NITI Aayog.
3. Sr. PPS to Member (VKS), NITI Aayog.
4. PS to Additional Secretary (Energy), NITI Aayog.
5. PA to Joint Adviser (Coal)/(MNRE).
6. PA to Dy. Adviser (Chemical).

Annexure-I

List of Participant

S. No.	Name	Designation	Organization	E-mail Id	Contact No.
1.	Dr. Suresh Kumar Malhotra	Agriculture Commissioner	Ministry of Agriculture	agricommissioner@gmail.com	9968978191
2.	Shri V N Kale	Additional Commissioner	Ministry of Agriculture	vn.kale@nic.in	9891692897
3.	Ms. Bhawna Singh	Director	MoSPI	bhawna.75@nic.in	9711717804
4.	Shri Arjit Sen Gupta	Director	BEE	asengupta@beenet.in	9999210344
5.	Sh. Naresh Modi	Project Director	NCPAH	nareshmodi@ncpahindia.com	9910432892
6.	Sh. Shyam Gupta	Jt. Director	PPAC	sgupta@ppac.gov.in	9968687640
7	Sh. Rohit Lall	Joint Project Director	NCPAH	rohit.lall@ncpahindia.com	9958011082
8.	Sh. Aashima Priye	Jt. Director	PPAC	aashima.priye@ppac.gov.in	7506933410
9.	Sh. Sumit Mudga	Project Engg	BEE	Sumit.mudgal@beenet.in	8800335407
10	Sh. Raghav Pachouri	Associate Fellow	TERI	raghav.pachouri@teri.res.in	9711423310
11.	Sh. Harendra Kumar	Joint Adviser	NITI Aayog	kumar.harendra@nic.in	23096731
12.	Sh. Manoj Kumar Upadhyay	Dy. Adviser	NITI Aayog	mk.upadhyay@nic.in	9971131218
13.	Dr. Huma Naz	Research Associate	Ministry of Agriculture	humanaz83@gmail.com	9870816248

F. No. I-22/2/37/2018-P&E
NITI Aayog
(Energy and International Cooperation Vertical)

Sansad Marg, NITI Aayog
New Delhi-110001

Date: 7th August 2019

Office Memorandum

Subject: Minutes of sixth meeting of the sub-group on Agriculture sector Energy Data Management.

List of Participants is at Annexure-1.

2. A meeting to present the draft report of sub-group on Agriculture sector Data Management was held in NITI Aayog on 4th July, 2019 under the Chairmanship of Additional Secretary (Energy), NITI Aayog. At the outset, Deputy Advisor, NITI Aayog welcomes all the members and briefed about the work done by sub-group and presented the draft report with the detailed methodology used along with the data collection formats, prepared after the discussions and deliberations happened during the past five meetings of the sub-group. Various members provided the following inputs during the presentation:

a. Additional Secretary (Energy), NITI Aayog was of the view that current report and format created by the sub-group only captures data for agricultural operations, however, it should also cover the data related to non-agricultural and transportation related to the tractors.
b. He also suggested that the number of operations, used for calculation of energy consumption in machinery, should be replaced with the hours of usage per hectare for better projections. Moreover, it was discussed that the hours for ploughing and seed-bed preparation used for calculation of energy consumed by tractors would be different, therefore, average number of hours of operation should be considered and used for the projections.
c. The Chair also recommended that state selection for tubewell/pump related survey should be such where 100% metering is not available because if all the agricultural connections are metered then the data of energy consumption by agricultural users would be available with the DISCOMs. Further, the sample for the survey should have a mix of owners of the equipment and the farmers cultivating the land because the land tenants would not have the idea of exact per hour fuel requirements of the machinery for tractors, combine harvesters and power tillers.
d. It was also brought up that there needs to be segregation of land prepared using tractors and power tillers to avoid the duplication.
e. Focusing on energy consumption through solar pumps, it was questioned if all the solar pumps are metered or not. Further, under solar energy data, emphasis was put on the formats for better projections of future demands and it was suggested that survey should be conducted for solar energy generation, especially for the standalone solar panels since grid connected solar data would be available. A need for capturing the capacity as to the actual consumption was also expressed during the meeting.

f. Discussing the survey process, it was suggested that there should be a unified survey for number of tubewells and canal under irrigation. The data collected as a result of the survey should then be segregated and eventually used for the respective calculations.

g. It was expressed that the most important part of data collection and compilation would be reliability on the collected data, which would be maximum, if the information comes through metered sources.

h. Finally, Additional Secretory (Energy) stated that sub-group needs to meet once again to finalize the data format as discussed today and remove duplicity of the data capture for machine & irrigation related energy data management. He further stated that sub-group needs to include solar pump in holistic manner and define the survey approach for the data collection for different matrix.

3. The meeting ended with a vote of thanks to the chair.

(मनोज कुमार उपाध्याय)
(Manoj Kumar Upadhyay)
Deputy Adviser
उप सलाहकार
Telephone: /दूरभाषा न.-23042422

To,

1. **Dr. S.K. Malhotra, Agriculture Commissioner, Ministry of Agriculture, Room No 231, Krishi Bhawan, New Delhi-110001. Telephone: 011-23383549, E-mail: ag.comm@nic.in**
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Annexure-I

List of Participant

S. No.	Name	Designation	Organization	E-mail Id	Contact No.
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2.	Sh. Rohit Lall	Joint Project Director	NCPAH	rohit.lall@ncpahindia.com	9958011082
3.	Sh. Ashish	Research Associate	TERI	ashish.sharma1@teri.res.in	
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5.	Sh. Ganesha Nadar	Joint Director	PPAC	ganesha.nadar@ppac.gov.in	7869911139
6.	Sh. Sumit Mudgal	Project Engg	BEE	sumit.mudgal@beenet.in	8800335407
7	Ms. Bhawna Singh	Director	MoSPI	bhawna.75@nic.in	9711717804
8.	Sh. Manoj Kumar Upadhyay	Dy. Adviser	NITI Aayog	mk.upadhyay@nic.in	9971131218
9.	Ms. Poonam Kapur	Economic Officer	NITI Aayog	poonam.kapur@nic.in	
10	Ms. Aakriti Kapoor	YP	NITI Aayog	aakriti.kapoor@nic.in	

F. No. I-22/2/37/2018-P&E
NITI Aayog
(Energy and International Cooperation Vertical)

Sansad Marg, NITI Aayog
New Delhi-110001

Date: 19th August 2019

Office Memorandum

Subject: Minutes of final meeting of the sub-group on Agriculture sector Energy Data Management.

List of Participants is at Annexure-1.

2. A meeting to present the final report of sub-group on Agriculture sector Data Management was held in NITI Aayog on 02nd August, 2019 under the Chairmanship of Dr. S. K. Malhotra, Agriculture Commissioner, Ministry of Agriculture & Farmer Welfare. At the outset, Deputy Advisor, NITI Aayog welcomes all the members and briefed about the work done by sub-group and presented the final report with the detailed methodology used along with the data collection formats, prepared after the discussions and deliberations happened during the past six meetings of the sub-group.

3. Members of the sub-group has seen the report and suggested minor corrections in the tables of data formats. Members also suggested to add list of abbreviations and conversions of units & formulas.

4. The chairman of the sub-group appreciated the worked done by the sub-group and stated that the report contains all the requirements for energy data management in the agriculture sector. The micro-tables and other requirement may be develop during survey by survey agencies.

5. Based on above, sub-group has accepted the final report.

6. The meeting ended with a vote of thanks to the chair.

(मनोज कुमार उपाध्याय)
(Manoj Kumar Upadhyay)
Deputy Adviser
उप सलाहकार
Telephone: /दूरभाषा न.-23042422

To,

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15. Sh. Ashish, Research Associate, The Energy and Resources Institute, Darbari Seth Block, I H C Complex, Lodhi Road, New Delhi-110003. E-mail id: ashish.sharma1@teri.res.in.
16. Shri Ashok Sreenivas/ Shri Srihari Dukkipati, Senior Fellow, Prayas Energy Group, Unit III A & B, Devgiri, Joshi Railway Museum lane, Kothrud Industrial Area, Kothrud, Pune, MH 411038. Telephone: 91-20-25420720, E-mail id: ashok@prayaspune.org & srihari@prayaspune.org

Annexure-I

List of Participant

S. No.	Name	Designation	Organization	E-mail Id	Contact No.
1.	Dr. Suresh Kumar Malhotra	Agriculture Commissioner	Ministry of Agriculture	agricommissioner@gmail.com	9968978191
2.	Sh. Rohit Lall	Joint Project Director	NCPAH	rohit.lall@ncpahindia.com	9958011082
3.	Shri Naresh Modi	Project Director	NCPAH	naresh_modi@ncpahindia.com	9910432892
4.	Sh. Prahlad	Chief Engineer	CEA	prahlad_only@rediffmail.com	9968487810
5.	Ms. Aashima Priye	Joint Director	PPAC	aashima.priye@ppac.gov.in	7506933410
6	Ms. Bhawna Singh	Director	MoSPI	bhawna.75@nic.in	9711717804
7.	Sh. Manoj Kumar Upadhyay	Dy. Adviser	NITI Aayog	mk.upadhyay@nic.in	9971131218
8.	Ms. Poonam Kapur	Economic Officer	NITI Aayog	poonam.kapur@nic.in	

194059/2019/ENERGY

NITI Aayog
(Energy and International Cooperation Vertical)

Sansad Marg, New-Delhi 110001
Date: 2nd August, 2019

Subject: Meeting for finalization of report of sub-group on Agriculture sector for energy data management

With a view to find out the data gaps in energy sector, Working Groups on Demand and Supply side Energy Data Management were constituted by NITI Aayog on 16th May, 2018. The first meeting of the Supply Side Working Group was held on 4th June, 2018. After detailed discussions in the meeting, a sub-group on Demand Side Energy Data Management in the Agriculture Sector was subsequently constituted including co-opted officials from Ministry of Agriculture & Farmers Welfare, TERI, CEA, Indian Council of Agricultural Research, BEE, MoSPI, PPAC and Prayas Energy Group as members of the sub-group. The composition of this sub-group is indicated below:

1.	Dr. S. K. Malhotra, Agriculture Commissioner, Ministry of Agriculture & Farmers Welfare	Chairman
2.	Sh. A.K. Saxena, Director, The Energy & Resources Institute	Member
3.	Shri. Prahlad, Chief Engineer, Central Electricity Authority	Member
4.	Shri Manoj Kumar Upadhayay, Deputy Adviser, NITI Aayog	Member convener
5.	Dr. Kanchan Kumar Singh, ADG (Ag. Eng.), Indian Council of Agricultural Research	Member
6.	Shri V.N. Kale, Additional Commissioner, Ministry of Agriculture, DACFW	Member
7.	Ms. Bhawna Singh, Director, Ministry of Statistic and Program Implementation (MOSPI)	Member
8.	Sh. Arijit Sengupta, Director, Bureau of Energy Efficiency	Member
9.	Ms. Aashima Priye, Joint Director, Petroleum Planning & Analysis Cell	Member
10.	Shri. Ashok Sreenivas/ Shri Srihari Dukkipati, Senior Fellow, Prayas Energy Group	Member

Five meetings of the sub group were held in NITI Aayog, where three meetings were held under the Chairmanship of Dr. S.K. Malhotra, Agriculture Commissioner, Ministry of Agriculture and Farmers Welfare on 20th July 2018, 5th September 2018 and 11th October, 2018. The fourth meeting of the sub-group was held on 4th January, 2019 under the Chairmanship of Shri R. P. Gupta, Additional Secretary (Energy), NITI Aayog. The fifth meeting was held on 15th March, 2019 under the Chairmanship of Dr. S. K. Malhotra, Agriculture Commissioner, Ministry of Agriculture & Farmers Welfare. The Sixth meeting of Sub Group was held on 4th July, 2019 under the Chairmanship of Additional Secretary (Energy), NITI Aayog

After deliberations during these meetings, the sub-group finalized the identified gaps and prepared a report which was finalized during the sixth meeting of the subgroup, held on **2nd August, 2019 at 11:00 PM in Room No. 136, NITI Aayog,** in presence of following members:

S. No.	Name	Designation	Organization	Email	Tel. No.	Signature
1	Prahlad	C.E.	CEA	prahlad_only@rediffmail.com	9968481810	
2	Aashima Priye	Jt. Dir (DEES)	PPAC	aashima.priye@ppac.gov.in	7506933410	

194059/2019/ENERGY

3	ROHIT LALL	Jt. Project Dir.	NLPAH MOA&FW, GOI	rohit.lall@nepalindia.com	9958011082	Rohit Lall
4	MAHESH Modi	Project Director	NCPAH MOA&FW, GOI	naresh_modi@nfdb.gov.in	9910432892	
5	BHAWNA SINGH	Director	MoSPI	bhawna.75@gov.in	9711717864	
6	S K Malhotra	Ag Comm	DAC&FW	ag.comm@nic.in		
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