

# **CROP RESIDUE MANAGEMENT**

**OPERATIONAL GUIDELINES 2023-24**



सत्यमेव जयते

**Government of India**  
**Ministry of Agriculture & Farmers Welfare**  
**Department of Agriculture & Farmers Welfare**  
**(Mechanization & Technology Division)**  
**KrishiBhawan, New Delhi-110001**

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## **Crop Residue Management in the States of Punjab, Haryana, Uttar Pradesh, Madhya Pradesh and NCT of Delhi.**

The interventions of the crop residue management will be implemented as a component of RashtriyaKrishiVikasYojana (RKVY) with the objectives and operational guidelines described hereunder.

### **1.0 Introduction:**

- (i) A large portion of the paddy straw / crop residues are burnt in the field primarily to clear the field after the harvest of the preceding crop for the sowing of next crop. Burning these crop residue causes phenomenal pollution problems in the atmosphere and huge nutritional loss and physical health deterioration to the soil.
- (ii) It has been estimated that The burning of one tonne of paddy straw releases 3 kg particulate matter, 60 kg CO, 1460 kg CO<sub>2</sub>, 199 kg ash and 2 kg SO<sub>2</sub>. These gases affect human health due to general degradation in air quality resulting in aggravation of eye and skin diseases. Fine particles can also aggravate chronic heart and lung diseases.
- (iii) One ton of paddy straw contains approximately 5.5 kg N, 2.3 kg P<sub>2</sub>O<sub>5</sub>, 25 kg K<sub>2</sub>O, 1.2 kg S, 50-70% of micro-nutrients absorbed by rice and 400 kg of carbon, which are lost due to burning of paddy straw. Apart from loss of nutrients, some of the soil properties like soil temperature, pH, moisture, available phosphorus and soil organic matter are greatly affected due to burning.
- (iv) Crop Residue Management Options can be classified as in-situ and ex-situ management options. Retaining, incorporating or mulching the crop residues in the field and decomposing using consortia of microbes are the two possible in-situ crop residue management options. Baling and transporting straw from the field is other feasible ex-situ option when alternate, effective and economically viable usage methods are identified and facilities and infrastructure are created.
- (v) It is envisaged that appropriate mix of in-situ and ex-situ crop residue management options through a holistic approach of providing appropriate solutions, optimally utilizing the existing resources and establishing appropriate supply chain through a cluster based approach in the vicinity of various industries utilizing the crop residue will help containing the burning of crop residues in the open fields.
- (vi) In view of above, it is proposed to continue to support the efforts of the States of Punjab, Haryana, Uttar Pradesh, Madhya Pradesh and NCT of Delhi in

addressing the problems of crop residue burning through the interventions described hereunder:

## **2.0 Objectives:**

- (i) Protecting environment from air pollution and preventing loss of nutrients and soil micro-organisms caused by burning of crop residue;
- (ii) Promoting management of crop residue by retention/incorporation into the soil and establishing appropriate supply chain for further utilization through the deployment of appropriate mechanization inputs;
- (iii) Creating awareness among stakeholders through demonstration, capacity building activities and differentiated Information, Education and Communication strategies for effective utilization and management of crop residue.

## **3.0 Strategy:**

To achieve the above objectives, a focused approach of providing appropriate and already accepted machines for in-situ management will be adopted. Optimal utilization of already available machines and machines that will be made available to fulfil the gaps will be ensured. A supply chain will be established through a cluster based approach in the vicinity of various industries utilizing the paddy straw. The supply chain beneficiaries will collect, densify, store the paddy straw at desired locations and will make available the same to various users or industries as per requirement. Strategic Information, Education and Communication (IEC) will also be undertaken with the involvement of all stakeholders for mass awareness of farmers.

## **4.0 Annual Action Plan**

The State Governments of Punjab, Haryana, Uttar Pradesh, Madhya Pradesh and NCT of Delhi shall submit the comprehensive Annual Action Plan for all interventions of crop residue management. The funds sharing pattern for Centre and States will be 60:40 for the States of Punjab, Haryana, Uttar Pradesh and Madhya Pradesh and 100:0 for NCT of Delhi.

Procedure for preparation, submission and approval of AAP will be same as outlined in the common guidelines for RKVY. In brief, it will be as under:

- (i) A consolidated AAP for all the schemes of DA&FW may be prepared by the State Agriculture Department in one go including that for crop residue management.
- (ii) Tentative overall allocation of funds availability of all the schemes under RKVY including that for crop residue management will be communicated to the State Governments as a reference point to finalize the AAP.
- (iii) Presentation of overall AAP for the agriculture sector of the state will be done by the State Agriculture Secretary to Government of India and the comments of GoI will be given in the meeting itself and minuted.
- (iv) The final approval for the consolidated AAP with the comments of GoI will be approved by SLSC headed by the Chief Secretary of the State.
- (v) Further consolidated instructions will be issued by the Ministry of Agriculture & Farmers Welfare to State governments where decision making powers will be exercised by the State governments and detailed proposals need not be sent to the Central Government for approval.

<b>S. No.</b>	<b>Activity</b>	<b>Timeframe</b>
1.	Preparation of consolidated AAP by the states and communication to GoI	15 <sup>th</sup> February
2.	Presentation of AAP to the Ministry of A&FW, GoI by the State Agriculture Secretary	February – March (2 <sup>nd</sup> week)
3.	Final Approval by SLSC headed by Chief Secretary of the State.	31 <sup>st</sup> March

## 5.0 Annual Action Plan Components:

### 5.1 Financial assistance to farmers for procurement of crop residue management machines on individual ownership basis:

- (a) **Implementing Agencies:** State Governments/UTs
- (b) **Identification of Beneficiary:** Beneficiaries will be identified by the State/district nodal agencies in a transparent manner. The areas of having larger problems of crop residue burning may be focused to increase availability of appropriate machines.

- (c) **Financial Assistance:** The rate of financial will @ 50% of the cost of machinery. The list of machines identified for crop residue management together with ceiling limit for subsidy is indicated in **Annexure-I**.

## 5.2 Establishment of Custom Hiring Centres of Crop Residue Management Machines:

- (a) **Implementing Agencies:** State Governments

- (b) **Composition of Custom Hiring Centres:**

The machines/equipments for establishing Custom Hiring Centres (CHCs) appropriate for the crop residue management will be selected from within the list at **Annexure-I**. Each CHC should be provided the machines and equipments for the entire operations of crop residue management. The capacity of the machines may be selected on the basis of area to be covered in a cropping season.

- (c) **Financial Assistance:**

Financial assistance @ 80% of the project cost for the projects of Custom Hiring Centres (CHCs) costing up to Rs. 15 lakhs will be available to Rural Entrepreneurs (Rural youth and farmer as an entrepreneur), Cooperative Societies of Farmers, Self Help Groups (SHGs), Registered Farmers Societies, Farmer Producer Organizations (FPOs) and Panchayats. The maximum permissible assistance per machine under the CHC project will be the amount arrived by multiplying the maximum permissible assistance for each machine indicated in **Annexure I** with 1.6. The maximum permissible assistance for each project should not exceed Rs. 12.00 lakhs per project.

## 5.3 Establishment of crop residue/paddy straw supply chain:

The boarder objectives of the crop residue/paddy straw supply chain will be as under:

- Enable better environmental practices for ex-situ management crop residue.
- Establishing collection infrastructure, baling, transportation and handling of large amount of crop residue and creation of storage facilities.
- Utilizing the paddy straw in different industries utilizing it such as biomass power generation units, Biomass co-firing in Thermal Power Plants, Bio-CNG, Bio-Ethanol, etc.
- Assured procurement of paddy straw from farmers through the by the paddy straw aggregators.

- Ensure increase in income (both from the produce and later from the sale of paddy residue) for farmers and enhance rural employment and financial inclusion.

(a) **Implementing Agencies:** State Governments

(b) **Financial Assistance:**

(i) The project proposal based financial assistance will be provided only on the capital cost of machinery and equipment like Higher HP Tractor, Cutters, Tedder, Medium to Large Balers, Rakers, Loaders, Grabbers and Telehandlers. The capital subsidy will be released into the bank Escrow account of beneficiary through Direct Benefit Transfer (DBT). The financial contribution of each stakeholder may be as follows:

(a) Government (jointly by Central and State Governments) will provide financial support of 65%. The government shall implement the intervention through a bilateral agreement between Beneficiary, and Industries and monitor the effectiveness with respective State Agriculture Departments to monitor and manage the project. *The expenditure will be met from the flexi funds of the Crop Residue Management Scheme.*

(b) Industry as primary promoter of the project will contribute 25% and will act as the Primary consumer of the feedstock collected via machinery. Industry will be responsible for overall effective machinery deployment via most suitable machinery manufacturers, training of beneficiaries, aggregation planning along with volume and quality guidelines, on-ground execution of aggregation during post-harvest collection period, pricing of feedstock and offtake guidelines. Industry will be primary consumer of the feedstock throughout the life of the machinery.

(c) Farmer or group of Farmers or Rural Entrepreneurs or Cooperative Societies of Farmers or Farmers Producer Organizations (FPOs) & Panchayats will be the direct Beneficiary will contribute the balance 10% and will be the primary aggregator of feedstock and direct beneficiary of this PPP model. Farmer will perform the feedstock collection targets in line with the volume and quality guidelines of the end-use industry/project throughout the life of the machinery.

(ii) Financial assistance from the Government will be provided only on the capital cost of machinery and equipment and the rest of the capital

expenditure and required working capital may be arranged by the beneficiary utilizing National Agriculture Infra Financing Facility (AIF) or NABARD financing or financing from any other financial institution.

- (iii) The Indicative Capital Expenditure for Setting up Paddy Straw Supply Chain (For 3000 MT Paddy Straw per Season and 4500 MT Paddy Straw per Season) is given in **Annexure-II**. However, the maximum allowable cost for each machine covered under the project shall be decided by the State Governments. For the purpose of financial assistance on 4500 MT paddy straw per season projects, the capital cost of project will be limited to Rs. 1.50 Crores/project.

(c) **Management:**

The implementation of the intervention is proposed as a PPP (Public Private Partnership) model on pilot project basis to support the investment planned for ex-situ machinery deployment. The programme will be monitored by Department of Agriculture & Farmers Welfare with the help of Agriculture Departments of the State Government. However, the management of supply chain is the responsibility of scheme beneficiaries' e.g. Farmers or a group of farmers, entrepreneurs, Cooperative Societies of Farmers, Farmers Producer Organizations (FPOs) and Panchayats in association with the participating industry.

- (i) The projects will be implemented under the bi-lateral agreement between the Beneficiary and Industries utilizing the paddy straw. Agreement shall be executed between the stakeholders to ensure smooth implementation of the interventions keeping the interests of the industrial project and beneficiaries interests by addressing measures for Risk Mitigation, Default clauses etc., to protect the investment made by all respective stakeholders.
- (ii) The State Governments shall constitute a project sanctioning committee which shall devise a template for submission of project proposal by the beneficiaries. The Committee shall also evaluate the project proposals and recommend the proposals for approval or otherwise.
- (iii) The sample format for the bilateral agreement is enclosed as **Annexure-III** and the provisions indicated in the sample agreement may be amended as per the requirements and mutual consent of the parties.
- (iv) The projects will be implemented within the overall broad criteria indicated in the Concept Note enclosed as **Annexure-IV**. The concept note is just for reference purpose.



#### 5.4 Information, Education and Communication (IEC) for awareness on crop residue management

- (a) **Implementing Agencies:** The State Governments shall identify State Institutions, SAUs, KVKs, PSUs, ICAR & Central Government institutions for conducting the IEC activities and the funds will be provided by the States to these identified institutions based on their proposals.
- (b) **Objectives:** (i) Launching Massive information and publicity campaign amongst the farmers through coordinated efforts of all stakeholders to mobilize farmers for not burning the crop residue. (ii) Conducting capacity building programmes and large scale demonstrations of the technologies on the farmer's fields for speedy adoption of technologies by the farmers.
- (c) **Provisions and Financial Assistance:**
- (I) Demonstration of crop residue management machines on the farmers' fields:**
- (iv) Depending on the requirements, State Government institutions, KVKs, ICAR institutions, Central Government institutions, PSUs, may be allowed purchase of machinery and equipments for demonstration.
- (v) All demonstrations will be carried out under close supervision of Implementing Agency and the demonstrations sites shall be georeferenced and uploaded on the State portals.
- (vi) The machines to be demonstrated shall be identified by the implementing agencies. The implementing agencies will be provided full cost of machines to be procured and a contingency expenditure @ Rs. 6000/- per hectare will also be provided for taking up demonstrations on the farmers' fields.
- (vii) All implementing agencies will monitor the outcome of training and demonstration in terms of improvement in skills, and adoption of technologies etc.
- (II) Demonstration of Bio-decomposer Technology on farmers' fields:**
- (i) As the application of decomposer in the fields involves preparing and multiplying the formulation to a water soluble sprayable form in large quantities and then its application in the harvested fields

through suitable sprayers, the implementing agencies (State Governments, KVKs and ICAR institutions) may engage service providers/custom hiring centres having adequate resources after following due procedure for engagement of such service providers, for the following broader tasks to be carried out:

- (d) Conduct large scale demonstrations on the farmers' fields
- (e) Identify the farmers and area for large scale application of bio-decomposer technology
- (f) Geo-referencing of the identified area
- (g) Procuring and making available bio-decomposer in required quantity
- (h) Provide spraying services of the decomposer at scale through suitable sprayers
- (i) Advising the farmers to follow irrigation and primary tillage operations for completing the protocol of decomposition.
- (j) create awareness and ensure follow through on protocol for pre and post spraying operations
- (k) Monitoring the fields through satellite and ground observations for decomposition of the crop residue and that the fields are not burnt by the farmers
- (l) Reporting and documenting the entire demonstration programme and its outcome.

(ii) The financial requirements on actual basis towards these demonstrations may be met by the States from the overall funds made available for crop residue management.

(iii) The States may also procure this technology (bio-decomposer) from validated suppliers and provide the same to the farmers at free of cost.

**(III) Capacity Building Programmes on crop residue management:**

- (i) Depending on the requirements, State Government institutions, KVKs, ICAR institutions, Central Government institutions, PSUs, may be funded for purchase of machinery and equipments for providing training to farmers/users/stakeholders.
- (ii) An amount of Rs. 6000/- per trainee per week (05 days) will be provided to the institutes identified for training to meet the expenses towards manpower, boarding/lodging and transport. This financial assistance will be proportionate to the training duration

- (iii) All implementing agencies will monitor the outcome of training in terms of improvement in skills, and adoption of technologies etc.

**(IV) Information and publicity campaigns**

(i) The activities but not limited to the following may be implemented for mass awareness of farmers with the involvement of all stakeholders, social organizations and industry associations, NGOs etc.:

- (a) Advertisements in the electronic and print media and social media platforms.
- (b) Formation of social media groups for creating awareness, sharing benefits of crop residue management and relevant information & advisories among the farmers and other stakeholders
- (c) Radio jingles, State specific Audio-visual clips in local language, Star campaigning etc.
- (d) Mobilization of schools and colleges students through essay completion, painting, debate etc.
- (e) Award for village / Gram Panchayat, role model farmers for achieving zero stubble burning
- (f) Distribution of attractive publicity materials such as leaflets, pamphlets, placards, posters etc. Communication through banners, hoardings, wall paintings etc. at prominent locations.
- (g) Organizing Gram Sabhas, meetings, functions, KisanMelas etc.
- (h) Special and innovative programs for sensitization and mass awareness through panel discussions of farmers, short and long films on Doordarshan/ DD-Kisan and other private channels.

(ii) The financial requirements on actual basis towards these activities may be met by the States from the overall funds made available for crop residue management.

**6.0 Other Guidelines for Smooth implementation of the Interventions:**

- (i) The manufacturers eligible for supply of machines based on machine quality conforming to standard specifications, relevant and valid test report of the authorized testing institution and availability of product warranty & after sales service infrastructure from the manufacturer etc. shall be enlisted and updated on regular basis by the States. The cost of machines and their variants shall

- be left to be decided by the manufacturers depending on the competitive market forces. The manufacturers shall observe transparency in selling prices and the product warranty including after sales services intended to be provided to the farmers/beneficiaries.
- (ii) Manufacturers/suppliers that have tested their products either from FMTTIs or any identified institute by DA&FW will only be eligible for supply of machines.
  - (iii) The farmers/beneficiaries will be at their liberty to choose any machine/equipment and its variants depending on their requirements and as per their choice from within the list of empanelled manufacturers by the States and may negotiate the final price after bargaining with the manufacturer/dealer and the beneficiary will be eligible to get the subsidy amount as may be fixed by the States through DBT.
  - (iv) In the interest of promoting make in India and Atm-Nirbhar Bharat, it is desired that the States should not impose huge amount of Earnest Money Deposit (EMD) and Performance Bank Guarantees, as the manufacturers in small scale sector gets deprived of their participation in the empanelment process carried out by the State Governments for supply of machines under the scheme. The EMD and Performance Bank Guarantee, if at all necessary, may be kept at minimum level and proportionate the sale volume of the manufacturer or may be done away with and rather other measures such as surety bonds, insisting on adequate after sales service infrastructure and blacklisting of the firms for failing to meet obligations may be adopted.
  - (v) A comprehensive online system should be developed for implementing the interventions in the States having arrangements for data sharing on Central portal i.e. <https://agrimachinery.nic.in>.
  - (vi) Every machine costing Rs. 1.00 lakh and above supplied under the scheme shall mandatorily be geotagged. The self-propelled machines costing Rs. 1.00 lakh and above such as tractors, self-propelled crop reaper/reaper cum binders etc. supplied to individual farmers and Custom Hiring Centres should be installed with app based AI-powered telematics kit which can track the live movement & location of machine and keep the daily record of work done by the machine. The dashboard of the telematics kit shall be available with the beneficiary of the machines/CHCs and the district as well as State Nodal officer of the scheme. The telematics kit shall be provided by the manufacturers as standard attachment on their machines manufactured after 1st June 2023. The establishment of CHCs should be georeferenced and it should be mandatorily uploaded on the 'FARMS' Mobile App
  - (vii) The machines supplied under the subsidy programmes should have a standardized unique identification code provided on the body of the machine by laser cut through methods in such a way that it is clearly identifiable, visible and is tamperproof. The coding system shall be devised and informed to the manufacturers. However, the State specific coding system should not be made mandatory. Apart from unique identification code, every machine shall also be

provided with labeling plate firmly attached by riveting, hammer drive screws or welding in a conspicuous and readily accessible position on a part which is normally not likely to be replaced during use. It shall show clearly and indelibly the information (1) Complete name and address of the manufacturer (ii) Make & Model of the machine (iii) Type and size of machine (iv) Unique identification code of the machine (v) Month and year of manufacture (vi) Required size of prime mover.

**Annexure-I**

**Pattern of Assistance and Maximum Permissible Subsidy for the Farmers for procurement of crop residue management machines on individual ownership basis**

S.No.	Name of the machine/equipment	Pattern of Assistance	Maximum Permissible subsidy per Machine/ Equipment per beneficiary inclusive of GST @ 12% (Rs.)
1.	<b>Super Straw Management System (Super SMS) to be attached with Combine Harvester</b>	50%	54290
2.	<b>Happy Seeder</b>		
	a) 09 tine	50%	74,000
	b) 10 tine	50%	76,500
	c) 11 tine	50%	78,500
	d) 12 tine	50%	82,000
3.	<b>Paddy Straw Chopper/ Shredder/Mulcher</b>		
	a) Mounted type (Straw Chopper & Mulcher)		
	i) 5 ft	50%	74,000
	ii) 6 ft	50%	78,000
	iii) 7 ft	50%	82,000
	iv) 8 ft	50%	86,500
	b) Trailed type	50%	1,34,000
4	<b>Shrub Master/Rotary Slasher</b>	50%	22,375
5.	<b>Hydraulic Reversible M.B. Plough</b>		
	a) Two bottom	50%	71,250
	b) Three bottom	50%	92,750
	c) Four bottom	50%	1,14,250
6.	<b>Zero Till Seed cum Fertilizer Drill</b>		
	9 tine	50%	22,500
	11 tine	50%	25,600
	13 tine	50%	28,000
	15 tine	50%	30,000
7.	<b>Super Seeder</b>	50%	1,05,000
8.	<b>Baling Machines</b>		
	Balers (Round – Mini - below 14 kg per bale)	50%	1,50,000
	Balers (Round – Medium -above 16-25 kg per bale)	50%	5,50,000
	Balers (Round –big-180-200 kg per bale)	50%	9,00,000
	Baler (Rectangular 18-20 kg per bale)	50%	6,00,000
	Straw Rake	50%	1,50,000
9.	<b>Crop Reaper</b>		
	Tractor mounted	50%	75,000
	Self-Propelled	50%	75,000
	Self-Propelled reaper cum Binder (3 wheel)	50%	1,75,000
	Self-Propelled reaper cum Binder (4	50%	2,50,000

	wheel)		
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**Note: The financial assistance will be limited to 50% of the cost of the machine or the maximum permissible subsidy per machine as indicated above, whichever is lower.**

**Annexure-II**

**(A) Indicative Capital Expenditure for Setting up Paddy Straw Supply Chain (For 3000 MT Paddy Straw per Season)**

<b>Sr No</b>	<b>Required machines</b>	<b>Approximate Rate / Unit (Rs. in lakhs)</b>	<b>Qty</b>	<b>Tentative Amount (Rs. in Lakhs)</b>
1	Cutter /Rotary Slasher	0.70	1	0.70
2	Tedder Machine	5.25	1	5.25
3	Raker	5.85	1	5.85
4	Tractor 75 HP and above	18.00	1	18.00
5	Baler (200-300 kg Bale) – Rectangular or round bale	36.50	1	36.50
6	Tractor 50 HP for Tedder and Rake	8.5	2	17.00
7	Trolley (Flat, Single Axle, Local Fabricator) /Automatic bale loading trolley	3.50	3	10.50
8	Tractor attachment for Stacking (grabber)/ telehandler	5.00	1	5.00
9	Moisture Meter	0.35	1	0.35
10	Water tank (5000 Ltr)	0.25	1	0.25
11	Fire Extinguisher	0.05	1	0.05
12	Lightening Arrestor	0.40	1	0.40
<b>Total</b>				<b>99.85 or say Rs. 1.00 Crore</b>

**Note: Tractors required for transport trollies and grabber are supposed to be taken on rental basis.**



**(B) Indicative Capital Expenditure for Setting up Paddy Straw Supply Chain (For 4500 MT Paddy Straw per Season)**

<b>Sr No</b>	<b>Required machines</b>	<b>Approximate Rate / Unit (Rs. in lakhs)</b>	<b>Qty</b>	<b>Tentative Amount (Rs. in Lakhs)</b>
1	Cutter /Rotary Slasher	0.70	1	0.70
2	Tedder Machine	12.00	1	12.00
3	Raker	25.00	1	25.00
4	Tractor 90-110 HP	44.00	1	44.00
5	Baler (200-500 kg Bale) – Rectangular or round bale	46.00	1	46.00
6	Tractor 50 HP for Tedder and Rake	8.5	2	17.00
7	Trolley (Flat, Single Axle, Local Fabricator) /Automatic bale loading trolley	3.50	3	10.50
8	Telehandler	25.00	1	25.00
9	Moisture Meter	0.35	1	0.35
10	Water tank (5000 Ltr)	0.25	1	0.25
11	Fire Extinguisher	0.05	1	0.05
12	Lightening Arrestor	0.40	1	0.40
<b>Total</b>				<b>181.25 or say Rs. 1.80 Crores</b>

**For the purpose of financial assistance, the project cost will be limited to Rs. 1.50 Crores i.e. the project cost may be above Rs. 1.50 Crores/project, but the financial assistance from the Government will be calculated based on the project cost of Rs. 1.50 Crores/project.**

### Sample Bi-Lateral Agreement

This Agreement (herein referred to as “Agreement”) is made on this day of **(DATE)** at **(PLACE)**.

#### By and Between:

1. ----- (Name of the Biomass Based Industry) -----, a Company Incorporated under Companies Act, 2013 and having its registered office at------(complete address of Biomass industry)------(hereinafter referred to as “**Industry**” or “------(Short Title of Biomass Based Industry)-----” which expression shall, unless repugnant to the context or meaning thereof, be deemed to include its successors and permitted assigns) of the **FIRST PARTY**;

AND

2. **BENEFICIARY**, which expression shall unless repugnant to the context or meaning thereof, be deemed to include Farmer or group of Farmers or Rural Entrepreneurs or Cooperative Societies of Farmers or Farmers Producer Organizations (FPOs) or Panchayats (hereinafter referred to as “**Aggregator**” which expression shall, unless repugnant to the context or meaning thereof, be deemed to include its successors and permitted assigns) of the **SECOND PARTY**;

(Both of the parties mentioned hereinabove shall be individually referred to as the “**Party**” and collectively as the “**Parties**”)

#### WHEREAS

(a) The “**Government**” intends to contain the burning of Agri-residue / paddy straw in the open fields through an approach of providing accepted solutions for ex-situ management of Agri-residue / paddy straw and released guidelines vide OM No. ----- Dated ----- for providing financial assistance to Aggregator to establish Agri-residue / paddy straw supply chain for its utilization in different industries utilizing the same to achieve farmer’s welfare by way of reduced stubble burning and utilizing the abundant Agri-residue / paddy straw towards useful applications.

- (b) ----(Name of Biomass Based Industry) ----- referred to as an “**Industry**” is inter alia engaged in the manufacturing of --- (Products name) ----- from Agri-residue / paddy straw and other biomass. ---- (Name of Biomass Based Industry) ----- has set up a --- (Products name) ----- Project with capacity (-----), will utilize approximately ----- tons of Agri-residue / paddy straw per day and will utilize approximately ----- tons of Agri-residue / paddy straw per year. The plant is in -----(Location address of Biomass Based Industry /Plant).
- (c) The -----(Name and address of Aggregator) ----- referred to as an “**Aggregator**” is desired and willing to invest into the establishment of Agri-residue / paddy straw supply chain by way of acquiring required machinery and equipments through financial support of the Government and Industry and has agreed to collect, transport, store the Agri-residue / paddy straw at the allocated area or areas allotted by ---- (Name of Biomass Based Industry) ----- and will supply the same to ---- (Name of Biomass Based Industry) -----.

**NOW THEREFORE, in consideration of the foregoing and the mutual covenants contained in this agreement, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:**

## ARTICLE 1

### DEFINITIONS AND INTERPRETATION

- 1.1 Definitions: In this agreement, unless the context otherwise requires or expressly provides, the following words shall have the following meaning respectively:
- a) **Business day** shall be construed as a reference to a day (other than a Sunday) on which banks in the state where I&C Facility is situated are generally open for business
  - b) **Biomass Based Industry** means industries utilizing the Agri-residue / paddy straw for various purposes
  - c) **Catchment area** shall herein mean area within the radius of 10 to 35 kms of - ----(Name of Biomass Based Industry) ---- plant site situated ----- (Complete address of location) -----
  - d) **Government** means the State Department of Agriculture of the concerned State Governments
  - e) **Price** in reference to this agreement will mean the price at which biomass-based industry will purchase Biomass from the Aggregator.

- f) **Equipment or Machinery** means equipments and machines that are covered under the supply chain i.e., Cutters/Rotary Slashers, tedder, Raker, Baler, tractor, loader, trolley, telehandler etc.
- g) **Financial Assistance** shall be in the form of subsidy which will be provided to the beneficiary by the Government in the ratio mentioned in the scheme guidelines under para -----.
- h) **Law** shall mean all statutes, enactments, acts of legislature or parliament, laws, ordinances, rules, regulations, code, directives and orders of any Government Authority, Tribunal, Board or Court and if applicable, International Treaties and regulations.
- i) **MT** means Metric tonnes
- j) **OEMs** shall mean Original Equipment Manufacturer of the equipments and machines that are covered under the supply chain
- k) **Principal place of Business** in reference to this agreement means for parties -  
----- (Complete address of location of the biomass-based industry) -----  
---
- l) **Supply (collection, transport and storage of Agri-residue / paddy straw)** shall have meant ascribed to it in
- m) **Supply Process Flow** as indicated in para 8 of the concept note
- n) **Software** in reference to this agreement shall be called Straw management and automation mobile application which shall be given to the aggregators by  
----- (name of biomass-based industry) -----.
- o) **TPD** means tonnes per day.

## 1.2 Interpretation

Except where the context requires, this agreement shall be interpreted as follows:

- 1 References in this Agreement to any statutory provision shall include a reference to that statute or provision as amended, extended or re-enacted and to any statutory replacement thereof from time to time and shall also include reference to all statutory instruments and orders made pursuant to any such statutory provision.

- 2 the division of this Agreement into clauses and schedules and the insertion of headings and bold typeface are only for convenience and shall not affect the construction or interpretation of any provision of this Agreement;
- 3 words and numbers importing the singular shall include the plural and vice versa;
- 4 references to the Recitals, Clauses and Schedules are to the recitals and clauses of, and schedules to, this Agreement;
- 5 the Schedules to this Agreement form part of this Agreement and shall be deemed to be expressly set out in the body of this Agreement;
- 6 all words (whether gender-specific or gender neutral) shall be deemed of any gender are deemed to include the other gender;
- 7 the terms “hereof”, “herein”, “hereby”, “hereto” and derivative or similar words refer to this entire Agreement or specified Clauses of this Agreement, as the case may be;
- 8 a reference to any Party in this Agreement, including the Parties, shall, where the context permits, include such Person’s executors, administrators, heirs, legal representatives, successors and permitted assigns;
- 9 any obligation under this Agreement not to do something includes an obligation not to agree or allow that thing to be done;
- 10 an agreement, representation or warranty on the part of 2 (two) or more Persons binds them jointly and each of them individually;
- 11 a reference to any Law or to any provision thereof includes references to such Law as it may, during the term of this Agreement or the completion of the transactions contemplated herein, be amended, consolidated, modified, re-enacted or replaced by any other Law and to any subordinate legislation or regulation made under the relevant Law;
- 12 Unless the context otherwise requires, any period of time referred to shall be deemed to expire at the end of the last day of such period;
- 13 the expressions “hereof”, “herein” and other similar expressions shall be construed as references to this Agreement as a whole and not limited to the particular Clause or Schedule in which the relevant expression appears;
- 14 references to writing include in electronic form;
- 15 references to “Rupees”, “Rs.” and “INR” are references to the lawful currency of the Republic of India;
- 16 reference to any document includes an amendment or supplement to, or replacement or novation of, that document, but disregarding any amendment, supplement, replacement or novation made in breach of this Agreement;
- 17 reference to an “amendment” includes a supplement, modification, novation, replacement or re-enactment and “amended” is to be construed accordingly;
- 18 any word or phrase defined in the body of this Agreement as opposed to being defined in Article 1.1 above shall have the meaning assigned to it in such definition throughout this Agreement, unless the contrary is expressly stated or the contrary clearly appears from the context;

- 19 the Parties have each participated in the negotiation and drafting of this Agreement and if an ambiguity or question of interpretation should arise, this Agreement shall be construed as if drafted jointly by the Parties thereto and no presumption or burden of proof shall arise favouring or burdening either party by virtue of the authorship of any of the provisions in this Agreement;
- 20 This agreement is made and executed in the English, Hindi and Punjabi Language which shall be the governing text for all purposes.
- 21 Any reference to any period of time shall mean a reference to that according to Indian Standard Time;
- 22 Any reference to day shall mean a reference to a calendar day;
- 23 “**Lakh**” mean a hundred thousand (100,000) and crore means ten million (10,000,000);
- 24 Reference to a “**person**” and wording denoting a natural person shall be construed as a reference to any individual, firm company, corporation society, trust, government, state or agency of a state or any association or partnership (whether or not having separate legal personality) of two or more of the above and shall include successors and assigns;
- 25 The words “**include**” and “**including**” are to be construed without limitation and shall be deemed to be followed by “**without limitation**” or “**but not limited to**” whether or not they are followed by such phases;
- 26 Reference to any date, period or Project Milestone shall mean and include such date, period or Project Milestone as may be extended pursuant to this agreement;
- 27 The damages payable by either party to the other of them, as set forth in this agreement, whether on per diem basis or otherwise, are mutually agreed genuine pre-estimated loss and damage likely to be suffered and incurred by the party entitled to receive the same and are not by way of penalty (the “Damages”) and
- 28 Time shall be of the essence in the performance of the parties’ respective obligations. If any time period specified herein is extended, such extended time shall aobligationlso be of the essence.

## **ARTICLE 2 SCOPE OF THE AGREEMENT**

- 2.1 This Agreement details the terms and conditions, financial arrangement of Industry and Aggregator. Further, any specific terms or conditions, procedure or methodology specified/not specified in this Agreement, but relevant to the scope and deemed necessary to be amended/included, may be mutually discussed and agreed to between the Industry and Aggregator within two (2) months of signing of this Agreement and shall be included as an amendment as per Amendment Article of this Agreement.

- 2.2 Aggregator will undertake Activity at collection end of Agri-residue / paddy straw, transport, storage and supply it to industry in terms of this Agreement. The Industry and Aggregator shall respectively and faithfully abide by and subject themselves to the terms and conditions and stipulations of the Agreement.
- 2.3 The implementation of this Bi-lateral agreement is based on the Guidelines OM No. (.....) Dated....., a pilot project basis to support the investment planned for ex-situ machinery deployment. The programme will be monitored by Department of Agriculture & Farmers Welfare with the help of Agriculture Departments of the State Government. However, the management of supply chain is the responsibility of the Industry in association with the Aggregator.

### **ARTICLE 3 FINANCIAL ARRANGEMENTS**

- 3.1** The projects will be implemented under this Bi-lateral agreement between the (Name of biomass-based Industry) who shall be utilizing the Agri-residue / paddy straw ----- and ----- (name of the Aggregator) ----- . This agreement is executed between the parties to ensure smooth implementation of the projects keeping the interests of the ----- (name of biomass-based industry) ----- project and -----(Name of Aggregator) ----- interests.
- 3.2** Financial assistance will be provided to the Aggregator only on the capital cost of machinery and equipment as indicated in the guidelines issued by the Government and the rest of the capital expenditure and required working capital may be arranged by the aggregator. For working capital, National Agriculture Infra Financing Facility (AIF) by the Farmer or NABARD project financing may be used.
- 3.3** The Escrow agreement shall be executed between the Industry and the Aggregator. All cash inflows and outflows arising out of this agreement or matters incidental thereto shall be credited and debited, as the case may be, in accordance with the provisions of the escrow agreement. All the expenses and liabilities towards arrangement of such escrow account and agreement shall be borne by the Industry and Aggregator equally and jointly.

### **ARTICLE 4 Role of the Government:**

- (a) **Empanel the machinery suppliers**
- (b) **constitute a project sanctioning committee which shall devise a template for submission of project proposal by the Aggregator.**



- (c) examine the proposals through project sanctioning committee and approve the projects of Agri-residue / paddy straw supply chain management within 5 days of receipt of proposals
- (d) facilitate the aggregator to get financing from AIF/NABARD/Other financial institutions
- (e) guide the Aggregator for obtaining all regulatory clearances, such as fire, land sealing, conversion from agricultural to non-agricultural and, availability of government land, electricity supply, transmission system, waiver of development charges of development authority etc.
- (f) physical inspection of the machinery procured by the Aggregators and process for release of financial assistance through Escrow Agreement.

## **ARTICLE 5 OBLIGATIONS**

### **a. Obligations of the Industry:**

- (a) Finalize and submit the project proposal in co-ordination with the Aggregator.
- (b) facilitate the Aggregator in site selection and obtaining all regulatory clearances
- (c) contribute required Industry share of the project as per guidelines into the Escrow account of the Aggregator
- (d) facilitate the Aggregator to get financing from AIF/NABARD/Other financial institutions
- (e) facilitate the Aggregator in procuring the required machinery and equipments from the OEMs empanelled by the Government.
- (f) provide daily scheduling to the Aggregator for supply of required quantity of paddy
- (g) create awareness amongst farmers residing/owing land/property in the catchment area by through convenient mode.
- (h) purchase all the collected Agri-residue / paddy straw from the Aggregator at a rate as may be mutually agreed by Aggregator and Industry. Revisit the rate Year-on-Year based on the market condition.
- (i) shall throughout monitor the effectiveness of the project
- (j) facilitate Aggregator in maintenance and service of the equipments and machines through the authorized service network of the OEMs.
- (k) take actions against the Aggregator for not supplying the desired Quality, Quantity, Price and misuse of the equipment and machine in association with the Government through appropriate committee duly constituted for the purpose.
- (l) Responsible for asset utilization on yearly basis to the Government in terms of annual Agri- residue/ paddy straw collection (in tonnes per Agri-residue / paddy straw type).



**b. Obligations of the Aggregator:**

- (a) arrange land for storage of the collected paddy under the guidance of Industry
- (b) obtain all regulatory clearances, such as fire, land sealing, conversion from agricultural to non-agricultural, electricity supply, transmission system, development charges of development authority etc.
- (c) place order with the empanelled OEMs for procurement of machinery as included in the project proposal.
- (d) Contribute required Aggregator share of the project as per guidelines into the Escrow Account.
- (e) secure Industry contribution for the proportionate amount as per the project proposal and guidelines of the Government
- (f) receive financial assistance from the Government in the Escrow account
- (g) secure required working capital either through own funding or AIF or NABARD or other bank financing
- (h) make payments to the OEMs towards the procurement of machinery in alignment with the Escrow Account regulations.
- (i) tie up with the farmers for procurement of straw from the farmer's fields
- (j) engage necessary skilled and non-skilled manpower for continuous operation of the aggregation of Agri-residue / paddy straw
- (k) acquire required machines and collect the straw as per the scheduling as may be decided by Aggregator and Industry.
- (l) insure equipment or machinery against loss by theft, fire or by the Act of God
- (m) store baled straw as per the SOPs provided by the industry
- (n) insure the risk for the stock of biomass in storage, transit, fire and theft.
- (o) shall be responsible for the management of machinery for collection, Transportation, Storage of Agri-residue / paddy straw and also delivering the end product to the industry on timelines decided by Industry
- (p) shall exclusively provide the Agri-residue / paddy straw at a agreed price to Industry only with whom the agreement is made and not to any other industry.
- (q) Restrict the use of machines only for the use of the industry in designated cluster. In case of use of machines for other Industry, shall take prior consent or no objection from the industry with whom the agreement is signed.
- (r) shall not transfer/sell/mortgage/ hypothecate the machines and equipment in any manner whatsoever.

**ARTICLE 6  
PURCHASE OF MACHINERY AND EQUIPMENT**

- 6.1 The AGGREGATOR shall place an order with the empanelled manufacturers for procurement of Machinery and Equipments.

6.2 The Parties shall before (.....), open and establish an escrow account with the \_\_\_\_\_ Bank (the Escrow Bank”). The payment shall be made according to the timelines stated below:

**Financial Milestone/ Timelines:**

S.NO	Parties to the Agreement	Contribution in terms (%)	Tentative timelines for releasing payment in “ESCROW ACCOUNT” (Tentative)
1.	<b>GOVERNMENT</b>	65	30.10.2023
2.	<b>INDUSTRY</b>	25	10.07.2023
3.	<b>AGGREGATOR</b>	10	10.07.2023

- 6.3 The payment toward the purchase of Equipment and Machinery will be made from the ESCROW Account to be opened in the name of INDUSTRY. The parties and government will transfer their respective contribution in the ESCROW account according to the ESCROW Agreement.
- 6.4 All the expenses and liabilities towards arrangement / opening of such escrow account and agreement shall be borne by the INDUSTRY and AGGREGATOR Jointly in 50 – 50 Ratio.

**ARTICE 7  
OWNERSHIP OF EQUIPMENT AND MACHINES**

- 7.1 The Government shall not own any Equipment or Machine. It would just purely provide financial support and would monitor the effectiveness of the project.
- 7.2 Industry shall throughout monitor the effectiveness of the project.
- 7.3 Industry shall act as the primary or only consumer of feedstock aggregated by the procured machinery under the scheme and shall have the first right of ownership of machinery and can acquire possession in case of expiry of tenure of the agreement or termination due to any non-compliance or default on behalf of the Aggregator.

**ARTICLE 8  
QUALITY COMPLIANCE PARAMETER**

8.1 Below are the Quality acceptance criteria/ parameters of the straw to be supplied by the farmer at Industry Plant site.

S. No.	Description	Acceptance Criteria	Remarks
1.	Type of Bales	To be decided by the industry	
2.	Moisture	To be decided by the industry	
3.	Mandatory use of balers with cutting system	To be decided by the industry	
4.	Compression	To be decided by the industry	
5.	Stacking height	To be decided by the industry	

**ARTICLE 9  
INDEMNITY**

Either party will indemnify, defend, and hold harmless other party (including its successors, affiliates and assigns) and their respective directors, officers, employees, agents and/or any third party (the "indemnified persons") against any and all losses, liabilities, judgments, awards, costs, claims, expenses, charges etc. (individually and collectively, referred to as "Damage") (i) arising out of breach by the defaulting party of any of the terms contained herein; (ii) due to any representation, or other statement made by the defaulting party being or becoming untrue in any manner, (iii) due to any act, omission or negligence of the defaulting party or its personnel and/or persons engaged by him (in) any claims that may be made by the defaulting party's personnel against the suffering party for any reason whatsoever, without any limit in the amounts or time.

**ARTICLE 10  
INSURANCE**

**10.1 Insurance against storage of Machine and equipments:**

- a) It is a responsibility of the AGGREGATOR, at its own cost, during the tenure, to acquire adequate comprehensive insurance cover for corresponding to the risk of Equipment and machines against Marine, theft, fire etc;
- b) For corresponding to the risk for the stock of biomass in storage, transit, fire and theft;
- c) The copy of insurance papers shall be supplied to Industry before training by OEMs for Machinery and Equipments starts for Aggregator &
- d) The Selection of insurer shall be the responsibility of the industry.

**10.2 Insurance against Machine and Equipments**

- a) The Industry and the Aggregator shall purchase an Insurance cover in which contribution in terms of premium shall be borne by the Industry and the Aggregator;
- b) The industry shall pay premium in proportion to its own share as well as Government’s share in the capital cost of the machinery and equipment which comes out to be 90% (25% + 65%) contribution in terms of premium amount;**
- c) The Aggregator shall pay premium contribution in proportion to its 10% share in the capital cost of the Machine and Equipments&
- d) The selection of Insurer shall be the responsibility of the industry.

**ARTICLE 11**

**VOLUME, QUALITY AND TRANSPORTATION OF CROP RESIDUE**

11.1 INDUSTRY shall accept Crop Residue in case AGGREGATOR make compliance to the following criteria as given below

**(A) Volume for aggregation of Biomass (Agri-residue / paddy straw)**

S.No	Description	Default	Remarks
	Volume: Capacity to supply Biomass fuel as per desired specifications (Per season)	In case the supply is <40% (For supply of 3000 MT)	Written Notice will be issued stating with a onetime warning post Non-compliance of which can lead to a situation where ownership of the machines will be transferred to another AGGREGATOR after consulting with the
		In case the supply is	

		<30% (For supply of 4500 MT)	committee AGGREGATOR. defaulting
--	--	------------------------------------	--

**(B) Quality compliance parameters**

S.No.	Description	Acceptance Criteria	Remarks
1.	Type of Bales		
2.	Moisture		
3.	Mandatory use of balers with cutting system		.
4.	Compression		
5.	Stackling height		

**(C) TRANSPORTATION OF BIOMASS FROM FARM TO GATE**

In case the AGGREGATOR defaults in supplying the agreed biomass from farm to gate i.e not transporting aggregated biomass to the gate then a Written Notice will be issued stating with a onetime warning post Non-compliance of which can lead to a situation where ownership of the machines will be transferred to another AGGREGATOR after consulting with the committee defaulting Aggregator.

**ARTICLE 12**

**ASSIGNMENT AND SUBCONTRACT AND SUBSTITUTION**

- 12.1 The “AGGREGATOR” shall not without the prior written approval of INDUSTRY, assign or transfer its rights or obligations under the agreement or any part thereof, or any share, or interest therein to any other person.
- 12.2 That in case “AGGREGATOR” is unable to perform in any Season, he can propose the name of other person in writing and if approved by Committee, he can substitute the AGGREGATOR for the Season and accordingly Rights and Obligation under this agreement will be Assigned to that Person and that Person for the purposes of this Agreement will know as Substituted Aggregator for that Season.

- 12.3 That in case of Assignment to Substituted Aggregator, Machinery and Equipment will be handed over by AGGREGATOR to that person for that particular Season.
- 12.4 That proposal of substitution should be made before 1<sup>st</sup> August of Every Year.

### **ARTICLE 13 AMENDMENTS TO THE AGREEMENT**

No amendment or modification of this Agreement shall be valid unless the same is made in writing by the Parties and their authorized representatives and specifically stating the same to be an amendment of this Agreement. The modifications/ changes shall be effective from the date on which they are made/ executed unless otherwise agreed to.

### **ARTICLE 14 NOTICES**

All notices and communications required to be served under this agreement shall be considered to be duly served if the same been posted by registered mail at its last known address of business.

### **ARTICLE 15 TENURE**

This agreement shall come into force from the date of signing of this agreement and will continue till supply of quantity as given in Article... (which shall be added at the later stage) or Five years, whichever is earlier.

### **ARTICLE 16 EFFECTIVE DATE AND TERMINATION OF THE BI-LATERAL AGREEMENT**

- 16.1 This Agreement shall be deemed to have come into effect from the date of signing of the Agreement.
- 16.2 **Termination: This Agreement may be terminated by Industry in consultation with Government constituted committee by giving a one (7) days' notice in writing to Aggregator in the following cases:**
- (a) If Aggregator obtains the financial assistance on the basis of false information/ false statement.
  - (b) If Aggregator and Industry does not take up the Activity as per the terms of the Agreement.

- (c) If performance of Aggregator or Industry is not found satisfactory as per obligations indicated in Article 4 of the Agreement.
  - (d) If any fraud/ embezzlement is detected subsequently and not reported by Aggregator or Industry.
  - (e) Suppressing information regarding Conflict of Interest by the parties.
  - (f) If Aggregator or Industry is declared insolvent by the relevant competent authority.
  - (g) If Aggregator and Industry commits material breach of this Agreement.
  - (h) Non-payment/ non-realization of penalties or any dues by the aggregator and/or Industry
- 16.3 In the event of termination of the Agreement vide Clause 15.2, the rights and obligations of the Parties thereto shall be settled through mutual discussion between the Parties. Provided that any pending payments with respect to invoices for all completed Activities shall be paid by the Aggregator within thirty (30) days of date of termination of this Agreement. Provided further that in the event of termination of the Agreement vide Clause 15.2, the machines and equipment together with all physical assets acquired under the project are taken into the custody by the Industry.

## **ARTICLE 17 FORCE MAJEURE**

- 17.1 Neither of the party, in any way, except for any payment related obligations, be held liable for non-performance either whole or in part of this agreement or for any delay in the performance thereof in consequence of any Act of God, epidemics, quarantine restrictions, lawful strike, lock out, delivery interruptions, orders including administrative orders or decrees of any Government or Government authority, revolutions, wars, acts of enemies embargoes or other import restrictions or by any other acts, whether or not of the same class or kind as those set forth above, not within the control of the party, fulfilment on whose part is interfered with and which by exercise of reasonable diligence, the said party is unable to prevent.
- 17.2 Promptly but not later than 2 days, upon the occurrence of an event or circumstance that a party considers may subsequently lead it to claim force majeure relief under this agreement, such party shall give notice to such effect to the other party, describing such event or circumstance and the obligations the performance of which could be delayed or prevented thereby,
- (a) The parties shall exercise reasonable diligence to resume normal performance of this agreement as soon as possible, after the occurrence of an event of force majeure.

- (b) Even prior to resumption of normal performance, the parties shall continue to perform their obligations under this agreement to the extent not prevented by such event of force majeure.

**ARTICLE 18  
GOVERNING LAWS AND JURISDICTION**

This agreement shall be governed and construed in accordance with the laws of India including without limitation, the relevant Central and State acts and the rules, regulations and notifications issued and amended there under from time to time and subject to clause 18 below, the courts of (.....) shall have the exclusive jurisdiction in relation to all disputes arising from or relating to the agreement.

**ARTICLE 19  
DISPUTE RESOLUTION**

- 19.1 A dispute shall be deemed to have arisen under this agreement, when either party notifies the other party of any issue, difference or dispute in writing to that effect.
- 19.2 Any dispute arising out of this agreement shall be resolved amicably through discussions in good faith with a view to expeditiously resolve such dispute. In the event the Dispute cannot be resolved amicably with the period of 30 days from the date of its occurrence, either party may refer the dispute for resolution to State Government and even if not resolved, actions may be taken according to Arbitration and conciliation act, 1996.
- 19.3 The venue of arbitration shall be ----- and the language of arbitration shall be in English or Punjabi. The arbitrator shall pass a reasoned award and the award shall be final and binding on all the parties.

**SEAL OF PARTIES**

In witness whereof the Parties here to have signed this Agreement on the day of (Month) and year mentioned hereinbefore

For and on behalf of Industry Name: Designation: Seal: _____	For and on behalf of Aggregator Name: Designation: Seal: _____
Witnesses: (Name Address) 1. _____ 2. _____ Date: _____	Witnesses: (Name Address) 1. _____ 2. _____ Date: _____





**Annexure-IV**

**Concept Note on Establishment of crop residue/paddy straw supply chain**

**1. Context:**

Paddy Stubble burning is mainly practiced in Indo-gangetic plains of the States of Punjab, Haryana and Uttar Pradesh to clear the fields for Rabi Crop sowing, because of the short time window between the harvesting of paddy and the sowing of next crop.

It has been estimated that, burning of one tonne of paddy straw releases 3 kg particulate matter, 60 kg CO, 1460 kg CO<sub>2</sub>, 199 kg ash and 2 kg SO<sub>2</sub>, which affect human health due to degradation in air quality.

On the other hand, one ton of paddy straw contains approximately 5.5 kg N, 2.3 kg P<sub>2</sub>O<sub>5</sub>, 25 kg K<sub>2</sub>O, 1.2 kg S, 50-70% of micro-nutrients absorbed by rice and 400 kg of carbon, which are lost due to burning. Some of the soil properties like soil temperature, pH, moisture, available phosphorus and soil organic matter are greatly affected due to burning.

An estimated 8.9 million tonnes of paddy straw are still being burnt in Punjab, Haryana and the scale of burning in Punjab is more severe as around 7.3 million tonne is burned alone in Punjab.

State	Total cultivable area in Kharif (lakh ha)	Area under Kharif Paddy (Lakh ha)			Paddy Straw Generated (Million tonne)	Paddy Straw managed (million tonne)			Paddy Straw Burnt (million tonne)	Paddy area burnt (lakh ha)
		Total	Basmati	Non-Basmati		In-situ	Ex-situ	Total		
Punjab	42.0	31.43	4.36	27.07	19.99	9.00	3.50	12.50	7.49	12.57
Haryana	38.0	13.90	7.32	6.58	7.00	5.15	1.10	6.25	0.75	2.15
UP	128.73	59.99 (1.91)*	25.89 (1.89)*	34.10 (0.015)*	27.70 (0.68)*	-	-	-- (> 0.67)	(NA) (146 Ton)*	NA

\* in NCR adjoining districts viz. Muzaffar Nagar, Shamali, Meerut, Baghpat, Bulandshahar, Gaziabad, Gautambudh Nagar, Hapur

With the aim of addressing air pollution in Delhi and National Capital Region due to paddy stubble burning in the adjoining States of Punjab, Haryana and Uttar Pradesh and to subsidize machinery required for in-situ management of crop residue, the Department of Agriculture & Farmers Welfare implemented a Central Sector Scheme on 'Promotion of Agricultural Mechanization for In-Situ Management of Crop Residue in the States of Punjab, Haryana, Uttar Pradesh and NCT of Delhi' w. e. f. 2018-19. Under this scheme

financial assistance for purchase of crop residue management machines is provided @ 50% of the cost to individual farmers and @ 80% of the project cost for establishment of Custom Hiring Centres of Crop Residue Management Machines by the Cooperative Societies of farmers, FPOs and Panchayats. Financial assistance is also provided to the States and ICAR for undertaking Information, Education & Communication (IEC) activities for mass awareness of farmers and other stakeholders. The Scheme promoted the usage of machines such as Super Straw Management Systems, Happy Seeder, Super Seeder, Smart Seeder, Zero till seed cum fertilizer drill, Mulcher, Paddy Straw Chopper, Hydraulically Reversible Mould Board plough, Crop reapers and Reaper binders for in-situ management of crop residue and Small Scale Balers & Rakes which are used for straw collection in the form of bales for other ex-situ uses of straw.

During the period from 2018-19 to 2022-23, Rs. 3138.17 crores have been released under the scheme (Punjab – Rs. 1426.45 crores, Haryana – Rs. 916.71 crores, Uttar Pradesh – Rs. 713.67 crores, NCT of Delhi – Rs. 6.05 Crores and ICAR– Rs. 75.19 crores).

During these 5 years, the states have distributed more than 2.42 lakh machines to the individual farmers and to more than 38000 CHCs for the states of Punjab, Haryana, Uttar Pradesh and Delhi NCR, which also include more than 5000 small scale Balers & Rakes which are used for collection of straw in the form of bales so that the paddy straw can be utilized in industries utilizing the paddy straw for various purposes.

The focus of the aforementioned scheme for crop residue management is primarily on in-situ methods. However, during the last 5 years, it has been noticed that some of the machines like happy seeders, mulchers, paddy straw choppers have not been used by the farmers and most of these machines are standing idle or have been discarded by the farmers/CHCs.

Punjab has 13 biomass power plants, with an aggregate capacity of 111.50 MW, consuming **1.00 Million tonnes** of paddy residue annually. Other than biomass projects, eight bio-CNG projects are being executed in the state. These can use around **0.3 million tonnes** of paddy residue annually. A bio-ethanol plant located in Bhatinda with a capacity of 100 kilolitres per day, which is under execution, may utilise **0.2 Million tonnes** of paddy stubble annually. Germany-based Verbio Group's Indian subsidiary has set up the largest biofuel (biomethane/bio-CNG) production unit in Sangrur with 33 tonnes per day capacity of compressed biogas. The annual straw consumption in this unit will be **0.13 Million tonnes**. Similarly, in Haryana, the Second-Generation (2G) Ethanol Plant has been set up by Indian Oil Corporation Limited (IOCL) in Panipat Refinery having the capacity of 100 kilolitre/day. The plant is expected to utilize **0.2 million tonne** of paddy straw annually. Four more paddy straw-based biomass power projects are being set up in state one each in Kurukshetra (15MW), Kaithal (15MW), Jind (9.9MW) and Fatehabad (9.9MW). After being made operational, the

biomass plants will generate a total of 49.8 MW electricity units by consuming **0.59 Million Tons** of paddy straw.

The Ministry of Power has mandated blending of biomass pellets made primarily of agro residue along with coal under the “Revised Policy for Biomass Utilization for power generation Through Co-firing in Coal based Power Plants” issued on 08.10.2021. All thermal power plants to use 5% blend of biomass pellets made, primarily, of agro residue along with coal with effect from one year of the date of issue of this guideline. The obligation shall increase to 7% (except for those having Ball & Tube mill the use of biomass remain 5%) with effect from two years after the date of issue of this order and thereafter. The NTPC have two thermal power plants at Dadri in Uttar Pradesh and Jhajjar in Haryana having 1820 and 1500 MW capacity respectively, of which the daily pellet requirement has been projected as 920 Metric Tons and 760 Metric Tons which may be equivalent to 1.2 Million Tons of paddy straw annually. There are other several Power Generation Companies in Punjab, Haryana & Uttar Pradesh, which have also been mandated for co-firing of biomass pellets. The demand of biomass pellets is about 5000 Metric Tons/ Day.

Securing reliable and cost-effective supplies of paddy straw in a sustainable manner over the operating life, is a key for the viability of these projects. It is, therefore, necessary that proper paddy straw supply chain including adequate value addition mechanisms needs to be established in the catchment areas of such industries utilizing the paddy straw.

## **2. Problems to be addressed:**

- Burning crop residue causes phenomenal pollution problems in the atmosphere and huge nutritional loss and physical health deterioration to the soil.
- Time available between the rice harvesting and wheat sowing is very narrow and in the range of 20 to 30 days.
- Missing link of paddy straw supply chain management which is important in effective ex-situ crop residue utilization of paddy straw with the help of machinery and equipment like Higher HP Tractor, Cutters, Tedder, Medium to Large balers, Rakers, Transport Trailers, Loaders, Grabbers, and Telehandlers, as they are high CAPEX intensive.
- To contain the burning of paddy straw in the open fields, a focused approach of providing appropriate and already accepted solutions for ex-situ management to be adopted. A supply chain to be established through a cluster-based approach in the vicinity of various industries utilizing the paddy straw. Through this approach, the supply chain beneficiaries will collect, densify, store the paddy straw at desired locations and will make available the same to various users or industries as per requirement.

- Therefore, in view of above to address air pollution and to subsidize machinery and equipment required for management of crop residue like Higher HP Tractor, Cutters, Tedder, Medium to Large balers, Rakers, Transport Trailers, Loaders, Grabbers, and Telehandlers a special intervention **“Promotion of Medium to Large Mechanized Aggregation Solutions for Project specific Ex-Situ Management to implement Crop Residue Management in the states of Punjab, Haryana, Uttar Pradesh and NCT of Delhi via Public Private Partnership (PPP) model”**.

### **3. Aims and Objectives:**

The boarder objectives of the interventions would be to accomplish crop residue management to ensure biomass supply security for pre-identified ex-situ based small-medium-large scale industrial projects of bio-CNG/CBG, Bio-Ethanol or Biomass based power generation and achieve farmers’ welfare by way of reduced stubble burning and utilize the abundant Biomass towards useful applications. Implementation of the following measures will support the objective:

- Enable better environmental practices for ex-situ Crop Residue Management to reduce burning of paddy straw.
- Utilizing the paddy straw in different industries utilizing it such as biomass power generation units, Biomass co-firing in Thermal Power Plants, Bio-CNG, Bio-Ethanol, etc.
- Mechanization via Ex-situ Management Machinery to ensure Biomass availability in catchment area (within 10 to 35 Kms) of industrial units.
- Establishing collection infrastructure, densification, transportation, and handling of large amount of paddy straw and creation of storage facilities.
- Assured procurement of feedstock from farmers through the Village Level Entrepreneurs (VLEs), by the Biomass Supply Chain Companies in catchment area for Collection, Storage and Transportation of crop residue.
- Ensure increase in income (both from the produce and later from the sale of paddy residue) for farmers.
- Enhance rural employment and financial inclusion.
- Save costs on fossil fuels and enable conservation of own stocks.
- Enable procurement of equipment to be used in the Paddy Straw Supply Chain through capital subsidy and loan incentives and policies supporting the same by all levels of governance.

**4. Strategy:** To contain the burning of paddy straw in the open fields, a focused approach of providing appropriate and already accepted solutions for ex-situ management will be adopted. A supply chain will be established through a cluster based approach in the vicinity of various industries utilizing the paddy straw. The supply chain beneficiaries will collect, make bales, store the paddy straw at desired locations and will make available the same to various users or industries as per requirement.

**5. Target beneficiaries:** Farmers, rural entrepreneurs, Cooperative Societies of Farmers, Farmers Producer Organizations (FPOs) and Panchayats. Farmers will get extra income for the unused paddy straw available with them. Through supply chain, Farmers, rural entrepreneurs, Cooperative Societies of Farmers, Farmers Producer Organizations (FPOs) and Panchayats will create established network for collection of paddy straw, indirectly creating employment opportunities in rural areas.

**6. Legal Framework:**

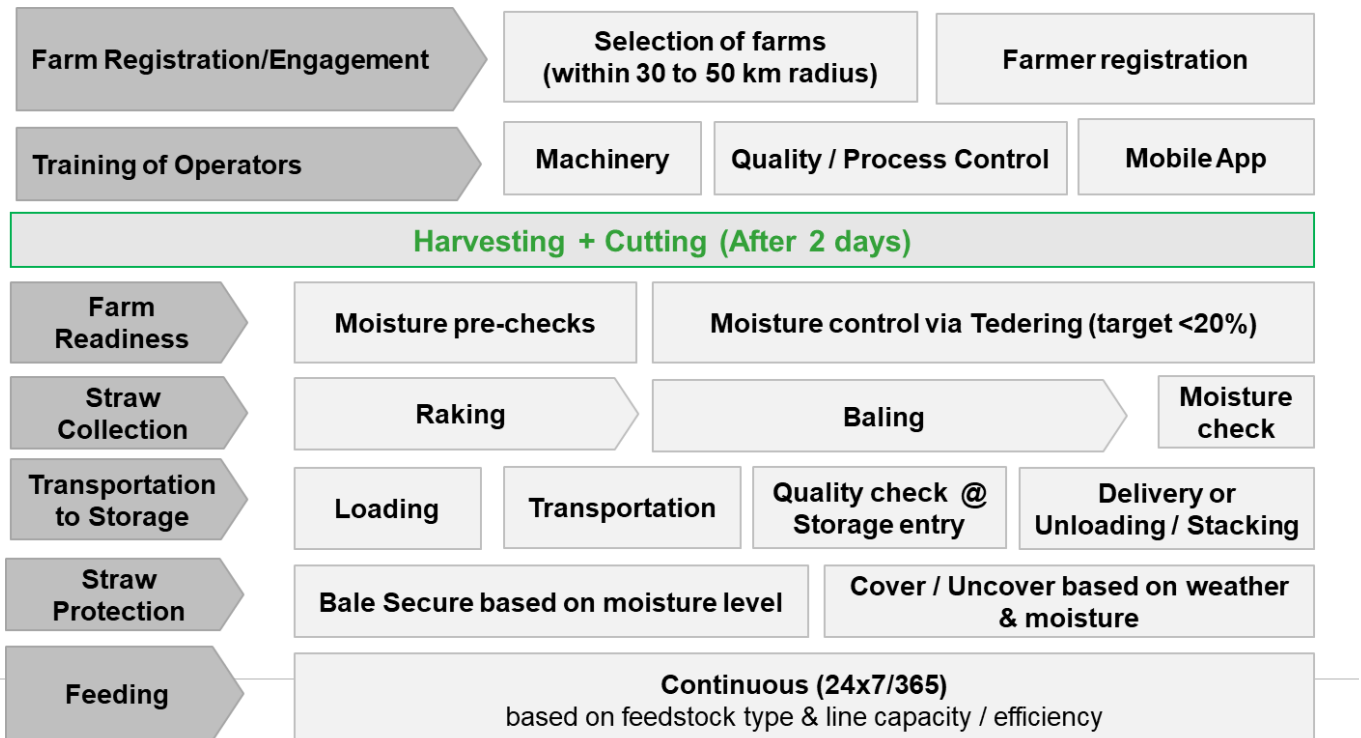
Not applicable as no specific legality is involved. All matters shall be resolved with mutual agreements to be signed between all the stakeholders

**7. Environmental Impact:** This will prevent burning of paddy straw in open fields and improve the air quality in those states and surrounding areas including the Delhi and NCR.

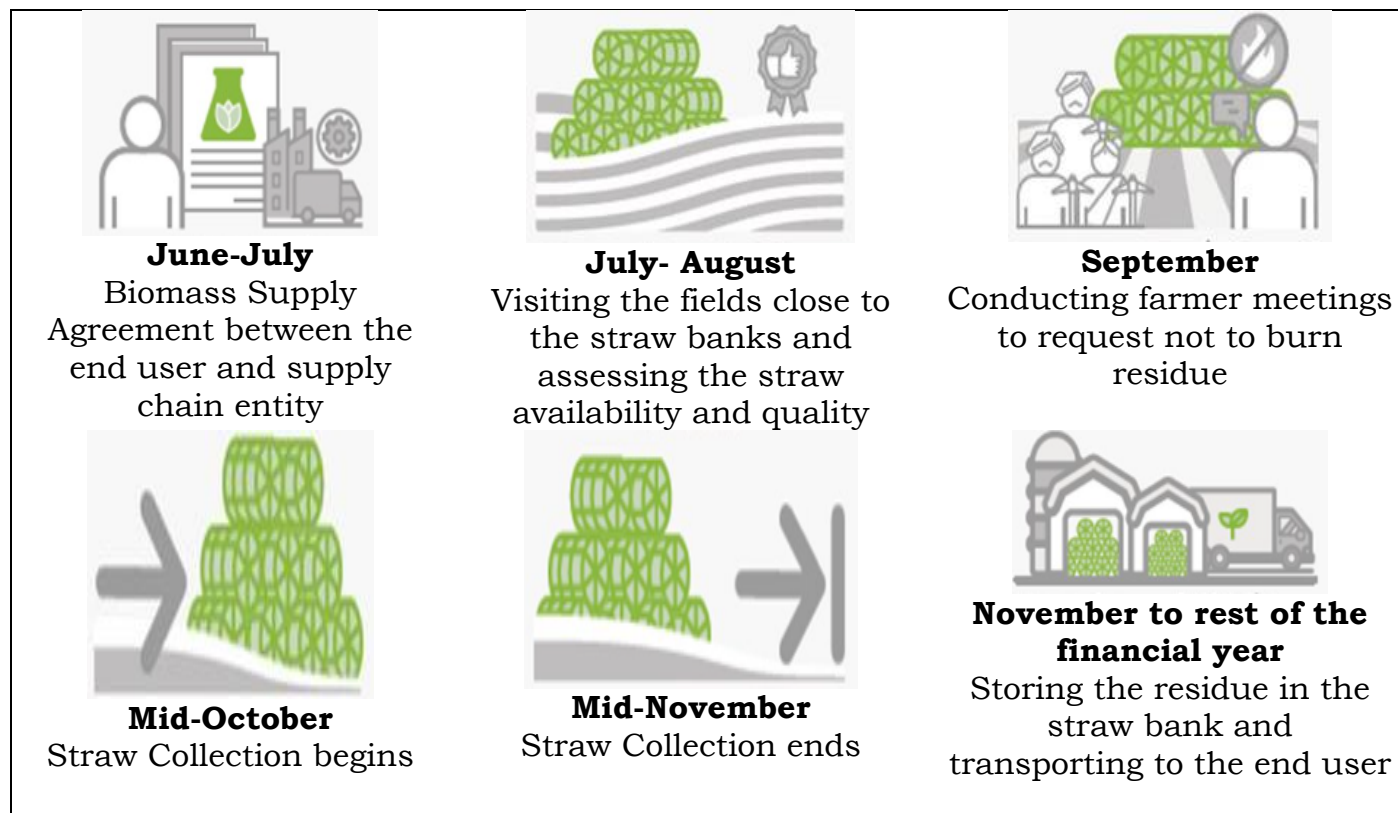
**8. Technology:** In the collection and value addition of Biomass, the established equipment like balers, rakers, cutters, tedder machine, loaders, transport trailers, grabbers etc. are available in the market. Some of the high capacity tractors and balers needs to be imported and suppliers/companies are already having establishments in India.

The process flow of the Fully integrated supply chain from Farm to Feed inclusive of Quality control – Collection – Transportation – Storage – Protection – Feeding:

**Figure 1: Fully integrated supply chain from Farm to Feed**



### Timelines of Ex-Situ Crop Residue Operation



Detailed List of Small, Medium & Large Machinery and Equipment for establishment of Paddy Straw Supply Chain Management are given as below in table:

**Table 1: Ex-situ management machinery for Collection, Transportation & Storage of Paddy Straw**

Machinery	Purpose	Specification	Price Range (Landed cost)
<b>Primary Management Machinery</b>			
<b>Tedder</b>	Moisture reduction	<b>Small Tedder:</b> Working Width: 4.2-5.6m, Rotors: 4	INR 5-6 lakhs
		<b>Medium Tedder:</b>	INR 11 lakhs to 20 Lakhs



		Working Width:6.2-8.2m, Rotors: 8	
		<b>Large Tedder:</b> Working Width:9-11.2m, Rotors: 8-10	INR 22 lakhs to 30 Lakhs
<b>Raker</b>	Consolidation of scattered biomass, i.e., swath for baler	<b>Small Raker (Single Rotor)</b> Width: 3.5-4.6m, Rotors: 1	INR 3-10 lakhs
		<b>Medium Raker:</b> Working Width: 5.7-8.8m, Rotors: 2	INR 15-25 lakhs
		<b>Large Raker:</b> Working Width: 9.3-10m, Rotors:2-4	INR 28- 35 lakhs
<b>Baler</b>	Small bales up to 30 Kg	<b>Small Square balers:</b> L*B*H 1m*0.45m*0.375 m	INR 12 to 16 Lakhs
	Bales from 200-300 kg	<b>Fixed Chamber Baler:</b> Bale Dia. 1.25-1.55m, Height: 1.2m, Power Source:60-75hp	INR 20 lakhs to 40 lakhs
	Round mid-sized bales of 200 Kg to 500 kg	<b>Variable Chamber Baler</b> Bale Dia*Width: 1.25-1.80 Meter, Height: 3.6 to 4.5 Meter, Power Source: 70 to 90 HP	INR 25 lakhs to 55 lakhs
<b>Tractor</b>	Prime mover for medium to large Balers	<b>Large tractors:</b> 75-90+ hp	INR 15 lakhs to 25 lakhs
<b>Secondary Management Machinery (Transportation and Storage)</b>			
<b>Loader</b>	Loading of bales from farms to trolleys	<b>Hydraulic loader:</b> 14ft loading height with single round bale.	INR 3.5 – 6 lakhs
<b>Trolley</b>	Transportation to storage areas	25 ft hydraulic trolley with 7-8-ton capacity	INR 3.5 – 4.5 lakh
<b>Telehandler</b>	Unloading and Stacking / Unstacking at storage location	<b>Small Tractor type:</b> 21 ft loading height up to 250 kg	INR 15 lakhs
		<b>Medium Telehandlers:</b> 7.2 m Lift capacity: 3 ton	INR 27 to 32 lakhs
		<b>Large Telehandlers:</b>	INR 30 to 35 lakhs



		11 Lift capacity: 3ton	m	
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## **9. Management:**

The implementation of the intervention is proposed as a PPP (Public Private Partnership) model on pilot project basis to support the investment planned for ex-situ machinery deployment. The programme will be monitored by Department of Agriculture & Farmers Welfare with the help of Agriculture Departments of the State Government. However, the management of supply chain is the responsibility of scheme beneficiaries' e.g. Farmers, rural entrepreneurs, Cooperative Societies of Farmers, Farmers Producer Organizations (FPOs) and Panchayats in association with the participating industry.

- (v) **The projects will be implemented under the bilateral agreement (sample agreement enclosed as Annexure-II) between the State Government, Beneficiary and Industries utilizing the paddy straw. Bilateral agreement shall be executed between the stakeholders (Beneficiary and Industry) to ensure smooth implementation of the scheme keeping the interests of the industrial project and beneficiaries interests by addressing measures for Risk Mitigation, Default clauses etc., to protect the investment made by all respective stakeholders.**
- (vi) Financial assistance will be provided only on the capital cost of machinery and equipment and the rest of the capital expenditure and required working capital may be financed utilising National Agriculture Infra Financing Facility (AIF) by the beneficiary. NABARD project financing may also be explored.
- (vii) Only those OEMs will be eligible to sell equipment's under the project which ensure repair & maintenance services & supply of spares in time bound manner during the season of aggregation of paddy straw
- (viii) Aggregation of biomass, it's transportation and storage will be classified as Agriculture & allied activities and accordingly there should not be any CLU requirement for setting up of biomass Depots.
- (ix) The land for storage of the collected paddy straw will be arranged and prepared by the beneficiary as guided by the end use industry. Respective state Governments may also provide lands, (revenue, panchayat, gochar, etc) at nominal lease rent for biomass storage as an agricultural activity
- (x) The end use industry shall purchase the paddy straw from the beneficiary on the rate as may be agreed by Industry and Aggregator. The end use industry shall revisit the rate Year-on-Year based on the market condition. The

agreement between the end use industry and beneficiary shall be valid for a minimum period of 5 years from the date of signing.

- (xi) The use of the machine is restricted only for the use of the end use industry in designated cluster. However, if the beneficiary wishes to use the machine, they should take prior consent or no objection from the end use industry. The beneficiary shall not be permitted to transfer/sell/mortgage the machines and equipment
- (xii) Investment made by the end use industry and Government to the beneficiary shall be governed and monitored by Industry and Government. However, in cases if there are any default from the beneficiary either by not supplying the desired Quality, Quantity, Price and misuse of the machines appropriate actions to be taken by both Industry and Government. The machinery can be forfeited jointly by the Industry and Government.**
- (xiii) The State Governments shall constitute a project sanctioning committee for approving the projects of paddy straw supply chain management. The format for inviting the proposals, procedure for scrutinizing and approving the projects shall be devised by the committee.

**10. Finance:** Provisions will be incorporated in the existing component of Crop Residue Management that will be implemented under RashtriyaKrishiVikasYojana (RKVY) on 60:40 funds sharing pattern between the Centre and State. Government of India will provide its share to the State Governments. The project proposal based financial assistance will be provided only on the capital cost of machinery and equipment like Higher HP Tractor, Cutters, Tedder, Medium to Large Balers, Rakers, Loaders, Grabbers and Telehandlers. The capital subsidy will be released into the bank account of beneficiary through Direct Benefit Transfer (DBT). The financial contribution of each stakeholder may be as follows:

- **Government** (jointly by Central and State Governments) will provide **financial support of 65%**. The government shall implement the intervention through a **Bilateral agreement** between Beneficiary and Industries and monitor the effectiveness with respective State Agriculture Departments to monitor and manage the project. **The expenditure will be met from the flexi funds of the Crop Residue Management Scheme.**
- **Industry** as primary promoter of the project will **contribute 25%** and will act as the Primary consumer of the feedstock collected via machinery. Industry will be responsible for overall effective machinery deployment via most suitable machinery manufacturers, training of beneficiaries, aggregation planning along with volume

and quality guidelines, on-ground execution of aggregation during post-harvest collection period, pricing of feedstock and offtake guidelines. Industry will be primary consumer of the feedstock throughout the life of the machinery.

- **Farmer** or group of Farmers or Rural Entrepreneurs or Cooperative Societies of Farmers or Farmers Producer Organizations (FPOs) & Panchayats will be the direct **Beneficiary** will contribute **the balance 10%** and will be the primary aggregator of feedstock and direct beneficiary of this PPP model. Farmer will perform the feedstock collection targets in line with the volume and quality guidelines of the end-use industry/project throughout the life of the machinery.
- **Financial assistance from the Government will be provided only on the capital cost of machinery and equipment and the rest of the capital expenditure and required working capital may be financed utilising National Agriculture Infra Financing Facility (AIF) by the beneficiary. NABARD project financing may also be explored.**
- **Ownerships:**
  - The Government, both Centre and State shall not own any Machine or Equipment. It would be purely a financial support and monitoring the effectiveness of the project.
  - The Industry shall enter into a Bilateral agreement with the Beneficiary. Through which the industry shall monitor the effectiveness of the project. Industry shall act as the primary or only consumer of feedstock aggregated by the procured machinery under the proposed scheme and shall have the first right of ownership of machinery transfer in case of any non-compliance or default on behalf of the beneficiary
  - Farmer or group of Farmers or Rural Entrepreneurs or Cooperative Societies of Farmers or Farmers Producer Organizations (FPOs) & Panchayats shall be the direct beneficiary of the financial support provided by both Government and End Use Industry.

### **Financial requirements:**

- (a) Paddy Straw collection target for next 3 years – 1.5 Million Tons
- (b) The number of collection centres assuming each **mid-size** centre will collect 4500 Tons/season – 333 Nos.
- (c) Tentative Capital cost of 4500 Tons capacity collection Centre – 1.80 Crores
- (d) Total capital investment for 333 collection Centres – 600 Crores.
- (e) Total capital cost of 111 collection Centres during one year – 200 Crores to be shared as under. However, for the purpose of financial assistance on 4500 MT per Season project, the capital cost of the project will be restricted to Rs. 1.50 Crores/project

- Government share (Centre + State) – 108.23 Crores @ Rs. 0.975 Crores/Centre (capital cost of project is limited to Rs. 1.50 Crores/project)
- Industry share - 50.00 Crores @ Rs. 0.45 Crores/Centre (considering capital cost of project as Rs. 1.80 Crores/project)
- Beneficiary share- 41.77 Crores @ Rs. 0.18 Crores/Centre (considering capital cost of project as Rs. .18 Crores/project but for financial assistance purpose the project cost is restricted to Rs. 1.50 Crores/project)
- **Total - 200.00 Crores.**

**The Indicative Capital Expenditure for Setting up Paddy Straw Supply Chain (For 3000 MT Paddy Straw per Season and 4500 MT Paddy Straw per Season) is given in Annexure-I**

### **11. Time Frame:**

The above stated interventions will continue under the component of Crop Residue Management under RKVY and co-terminus with the end of 14<sup>th</sup> Finance Commission cycle.

### **12. Cost benefit analysis:**

The demand for bio-energy (bio-fuels, heat and electricity) is increasing steadily and paddy straw supply chain management has an important role to play for bio-energy production. Different components of the paddy straw supply chain include logistics of paddy straw collection, densification, storage and transport, conversion of paddy straw into briquettes and pellets. The single largest limiting factor for the industries utilizing paddy straw is the timely availability of paddy straw at an optimum cost. Integration of paddy supply chain and activities involved therein along with judicious design are likely to enhance the quantum of energy return, improve the greenhouse gas balance and reduce the water footprint of the bio-energy production facility.

### **13. Risk analysis:**

There is possibility of increase in price of paddy straw if there is a competition among various entrepreneurs, which will delay the breakeven period. However, this situation may arise after four to five years after proper supply chain is established. In near future the DA&FW does not foresee any threat.

### **14. Outcomes:**

The outcomes are-

- The initiative will supplement the efforts of paddy straw management through in-situ options

- During the three-year tenure of the interventions, 1.5 million metric tonnes of surplus paddy straw are expected to be collected which would otherwise have been burnt in fields.
- About 333 biomass collection depots of capacity 4500 MT will be built.
- Air pollution caused by stubble burning will be considerably reduced.
- As per information received from stakeholders, collection and storage of 100000 MT of biomass will employ around 1800 people for 40 days. If manpower for building of aggregation depot is excluded, then it will be approximately 1500 people for 40 days. Thus it would generate employment opportunities of about 9,00,000 man days.
- The interventions will encourage a robust supply chain management of paddy straw which shall further help in making paddy straw available for various end uses i.e., power generation, heat generation, bio- CNG, etc. by Power/bio-CNG/bio-ethanol producers
- Establishment of supply chain would result in new investments in Biomass to biofuel and energy sectors.

### **15. Evaluation:**

The interventions will be evaluated by an independent agency during the final year of its tenure.

### **16. Environmental Impact:**

This will prevent burning of paddy straw in open fields and improve the air quality in those states and surrounding areas including the Delhi and NCR.

**(A) Indicative Capital Expenditure for Setting up Paddy Straw Supply Chain (For 3000 MT Paddy Straw per Season)**

<b>Sr No</b>	<b>Required machines</b>	<b>Approximate Rate / Unit (Rs. in lakhs)</b>	<b>Qty</b>	<b>Tentative Amount (Rs. in Lakhs)</b>
1	Cutter /Rotary Slasher	0.70	1	0.70
2	Tedder Machine	5.25	1	5.25
3	Raker	5.85	1	5.85
4	Tractor 75 HP and above	18.00	1	18.00
5	Baler (200-300 kg Bale) – Rectangular or round bale	36.50	1	36.50
6	Tractor 50 HP for Tedder and Rake	8.5	2	17.00
7	Trolley (Flat, Single Axle, Local Fabricator) /Automatic bale loading trolley	3.50	3	10.50
8	Tractor attachment for Stacking (grabber)/ telehandler	5.00	1	5.00
9	Moisture Meter	0.35	1	0.35
10	Water tank (5000 Ltr)	0.25	1	0.25
11	Fire Extinguisher	0.05	1	0.05
12	Lightening Arrestor	0.40	1	0.40
<b>Total</b>				<b>99.85 or say Rs. 1.00 Crore</b>

**Note: Tractors required for transport trollies and grabber are supposed to be taken on rental basis.**

**(B) Indicative Capital Expenditure for Setting up Paddy Straw Supply Chain (For 4500 MT Paddy Straw per Season)**

<b>Sr No</b>	<b>Required machines</b>	<b>Approximate Rate / Unit (Rs. in lakhs)</b>	<b>Qty</b>	<b>Tentative Amount (Rs. in Lakhs)</b>
1	Cutter /Rotary Slasher	0.70	1	0.70
2	Tedder Machine	12.00	1	12.00
3	Raker	25.00	1	25.00
4	Tractor 90-110 HP	44.00	1	44.00
5	Baler (200-500 kg Bale) – Rectangular or round bale	46.00	1	46.00
6	Tractor 50 HP for Tedder	8.5	2	17.00

	and Rake			
7	Trolley (Flat, Single Axle, Local Fabricator) /Automatic bale loading trolley	3.50	3	10.50
8	Telehandler	25.00	1	25.00
9	Moisture Meter	0.35	1	0.35
10	Water tank (5000 Ltr)	0.25	1	0.25
11	Fire Extinguisher	0.05	1	0.05
12	Lightening Arrestor	0.40	1	0.40
<b>Total</b>				<b>181.25 or say Rs. 1.80 Crores</b>

For the purpose of financial assistance, the project cost will be limited to Rs. 1.50 Crores.