



Solutions to Stubble Burning

SUPPORT SYSTEMS WHICH CAN HELP ESTABLISH & SCALE UP SOLUTIONS

Key challenges

Rice-wheat cropping system, tied in with many policy incentives from the GR/PDS paradigm

Research & Extension system itself promoted stubble burning in the past

Shorter time gap between paddy harvesting & wheat sowing, after new law for June sowing for paddy brought in

Labour cost and availability issues - Stubble removal and expenses involved

“Paddy straw not relished by cattle” (apart from chemicals on the straw to be fed to animals) – more production than number of cattle?

Fog due to winter

Need for shift

Sustainability at farmer level

Valuable nutrients and organic matter lost

Groundwater depletion

Soil degradation

Air pollution – health implications especially on children

Climate change/emergency

SOLUTIONS

That do not generate straw (crop shifts)

That make good use of the straw within the farm or indirectly for soil fertility enhancement in an IFS approach

That take straw outside the farm for non-agricultural uses

SOLUTIONS BEING PROMOTED:

Different machines like Happy Seeder and Super Seeder and Roto-Seeders on “subsidy”

Shorter duration paddy varieties, and Direct Sowing of Rice

Procurement and use of straw for non-agricultural uses



Solutions at farmer level

Shift from rice-wheat cropping system

- Kharif/rabi pulse crop: AP experience
- Oilseeds like sunflower/castor/sesame/mustard

Horticulture: fruits and vegetables

Shift to short duration varieties for getting a longer time window or DSR (Direct Sowing of Rice)

Using straw and stubble

- Mulching material: treated with microbial solution
- Biomass into soil: incorporation using rotavator
- Composting: using chaff cutters plus decomposers
- Cattle fodder: treated with microbial solutions
- Appropriate tech, Smaller machines & custom hiring centres
- Biofuel: gassifiers/biogas
- Particle boards etc

Costs of cultivation and incomes across crops

	Punjab				Haryana					
	Paddy	Maize	Wheat	R&M (oilseed)	Paddy	Bajra	Cotton	Wheat	Gram	R&M (oilseed)
Cost of Cultivation (rs/ha)	81378	70719	71103	56728	83876	40676	70242	75410	42588	63380
Yield (qtl/ha)	75	40	52	15	57	19	14	51	19	20
Cost of Production (rs/qtl)	1085	1768	1367	3782	1472	2141	5017	1479	2241	3169
MSP	1868	1850	1925	4425	1868	2150	5515	1925	4875	4425
Total returns (per ha)	140100	74000	100100	66375	106476	40850	77210	98175	92625	88500
Net returns per ha	58722	3281	28997	9647	22600	174	6968	22765	50037	25120
Net returns per acre	23489	1312	11599	3859	9040	70	2787	9106	20015	10048

Current spending by governments

Subsidy	Punjab	Haryana
Total Net sown area	41,19,000 ha	35,22,000 ha
Power subsidy	Rs. 16,148/ha	Rs. 18,756/ha
	Rs. 6,651.00 cr per annum	Rs. 6,605 cr per annum
Fertilizer Subsidy	Rs. 13,525/ha	Rs. 11,601/ha
	Rs. 5,571 cr per annum	Rs. 4,085 cr per annum
Total	Rs. 29,674/ha	Rs.30,357 /ha
	Rs. 12,222 cr per annum	Rs. 10,690 cr per annum

Village level expenditure

				Subsidy per ha NSA (Rs/ha)								
	Power Subsidy (Rs crore)	Fertiliser subsidy (Rs crore)	Net Sown area	Power per Ha	Fertilizer per Ha	Total, per Ha	Average farm size (ha)	Subsidy per farm (Rs/year)	Number of villages	NSA per village (ha)	NSA per village (acre)	Subsidy per village
Punjab	6651	5571	4119000	16148	13525	29674	3.62	1,07,420	12729	323.59	809	96,02,263
Haryana	6605	4085	3522000	18756	11601	30357	2.2	66,785	6955	506.40	1266	1,53,72,732
Average								87,103				1,24,87,498

SUBSIDY PER HECTARE ON TWO COST COMPONENTS IS HIGHER THAN NET RETURNS PER HECTARE IN SEVERAL CROPS!

Incentives that could change the situation

Farmer level

Support incentives for crop shift to pulses and oilseeds – cultivation+price incentives and provide price support for only rice or wheat, along with assured support of procurement for the other crops

Support for not burning (direct benefit transfers)

Collective level

Custom hiring centres for machinery rather than individual support

Towards agroecological approaches, FPO, local infrastructure with ecological n economic parameters laid down

Area level

Ecosystem services assessed - incentives at village/block/district level on total reduction on fertilizer use, water use and energy use in addition to straw burning stoppage