O.I.H.

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION

LOK SABHA
UNSTARRED QUESTION NO. 2460
TO BE ANSWERED ON 02/01/2018

WASTAGE OF AGRICULTURAL PRODUCTS

2460. SHRI DHARMENDRA YADAV:
DR. PRITAM GOPINATH MUNDE:
DR. SHRIKANT EKNATH SHINDE:

Will the Minister of AGRICULTURE AND FARMERS WELFARE कृषि और किसान कल्याण मंत्री be pleased to state:

(a) whether the CIPHET has reported that the annual food wastage in the country is more than the annual national foodgrain production of a number of countries including Britain and if so, the details thereof;

(b) whether the value and volume of such wasted food items in the country is two third of the amount spent under National Food Security Programme and if so, the details thereof;

(c) whether the Government is formulating any policy to reduce the wastage of food items in the country, if so, the details thereof and the time by which the policy is likely to be implemented;

(d) whether the Government is considering to set up a new institution with public-private partnership for sale, purchase and storage of pulses and if so, the details including the objectives thereof along with the name of the State where this institute is likely to be set up; and

(e) whether the Government has constituted any committee in this regard and if so, the details thereof and the time by which final decision is likely to be taken in this regard?

A N S W E R

MINISTER OF STATE IN THE MINISTRY OF AGRICULTURE AND FARMERS WELFARE
कृषि और किसान कल्याण मंत्रालय में राज्य मंत्री
(SHRI GAJENDRA SINGH SHEKHAWAT)

(a) Based on the recommendations of the Parliamentary Standing Committee on Agriculture, the first study on estimation of post-harvest losses was conducted by ICAR-CIPHET in 106 districts of the country during 2005-07. The survey was undertaken with respect to 46 crops and commodities comprising 5 cereals, 4 pulses, 6 oilseeds, 8 fruits, 8

vegetables, 8 plantation crops and spices, 6 livestock produce and jaggery. A second study (repeat study) was conducted during the years 2012-2015.

The post-harvest losses according to this study are described in the Table below:

S.N.	Crops	Post-harvest loss*(% range)
1	Cereals	4.65-5.99
2	Pulses (Gram, tur & others)	6.36-8.41
3	Oilseeds	3.08-9.96
4	Fruits	6.70-5.88
5	Vegetables	4.58-2.44
6	Plantation crops	4.17-4.91
7	Spices	1.18–6.51

**Post-harvest losses pertain to the study conducted during 2012-2015*

The stages considered for assessment of losses were **harvesting, collection, threshing, grading/sorting, winnowing / cleaning, drying, packaging, transportation, and storage** depending upon the commodity. Over eating and wastage at consumer level were not parts of this study.

As India is a leading producer of agricultural commodities, even a small loss is huge in quantity which even exceeds production of small countries.

The details of the post-harvest loss for 45 commodities are presented in **Annexure-I**.

The grain available with FCI is stored and preserved properly. However as the Food grains are perishable commodity and FCI is storing/handling large quanities of foodgrains over long periods, a small quantity (0.02% Food grain against Offtake Quantity) becomes Non-issuable/rotten due to various reasons like:-

i. Transit damages viz enroute damage in wagon/truck due to contamination, wagon roof leakage etc.
ii. Due to Natural Calamities like Cyclone/flood damages.
iii. Possibility of down gradation of grains which are procured under relaxed specifications.
iv. In some cases due to negligence of officials/ officers, for which suitable disciplinary action against defaulters, where ever found guilty, are invariably taken.

(b) The volume of post-harvest loss of selected commodities is given in **Annexure-I**. The economic value of quantitative loss of 45 crops/commodities was calculated to be approx. Rs.92651 crore at average annual prices of 2014 (**Annexure-I**).

(c) A number of post-harvest equipment and technologies have been developed by the institutes under Indian Council of Agricultural Research and State Agricultural Universities. Some of these include, pedal cum power operated double screen grain

cleaner, maize de-husker sheller, motorised soybean de-huller, manually operated groundnut decorticator, TNAU insect trap, metal bins, mini dhal mill, maize degermer, shrink wrapping, evaporative cooling systems, packaging and transportation of perishables, post-harvest treatments for perishables etc. These technologies have helped in checking the post-harvest losses.

Apart from this, ICAR organizes training programs for farmers on minimizing post-harvest losses of food grains through its network of KVKs.

Recently, ICAR constituted Indian Grain Storage Working Group. This group is engaged in disseminating technologies for reduction in post-harvest losses of food grains and is actively engaged with FCI and other stake holders.

ICAR has conducted workshops in Delhi, Coimbatore, Bhubaneshwar on scientific practices of grain storage for reduction in post-harvest losses.

ICAR also promotes processing and value addition in rural catchments by agro-processing centres as it helps in prevention of post-harvest losses.

Further, ICAR's All India Co-ordinated Research Project on Post Harvest Engineering and Technology, (AICRP on PHET) with 30 Centres in State Agricultural Universities, ICAR institutes, Central University and IIT are involved in development and popularization of location and crop specific post-harvest technologies.

Indicative list of technologies developed by ICAR-CIPHET and AICRP on PHET is given as **Annexure-II**.

Food Corporation of India has taken steps to keep the wastages to bare minimum. These are:

1. Stocks are issued on FIFO Principle.

2. As per FCI Headquarters Instructions, no stocks are stored by FCI on un-scientific (katcha) plinths.

3. A drive has been launched to carry out effective prophylactic and curative treatment of stocks and regular inspections are being carried out to minimize damage to stocks.

4. Damage Monitoring Cells have been set up at District, Regional and Zonal levels to regularly monitor quality of stocks and reduce damages

5. Government of India has formulated a scheme called Private Entrepreneurs Guarantee (PEG) Scheme for construction of covered storage capacity. Under this Scheme, storage capacity is created by private parties, CWC, SWCs and other State Agencies for guaranteed hiring by FCI. Under PEG scheme, as on 30.11.2017, a capacity of 150.49 lakh MT has been sanctioned/ allotted to private investors, CWC and SWCs. A capacity of 139.67 lakh MT has already been completed.

6. Government has approved action plan for construction of steel silos in the country for a capacity of 100 LMT in the next four years in 3 phase as per details below:

Year	Selection of Silo Operator (LMT)	Silo Completion (LMT)
2016-17	36.25 LMT (Phase – 1)	5 LMT
2017-18	29.00 LMT (Phase – 2)	15 LMT
2018-19	34.75 LMT (Phase – 3)	30 LMT
2019-20		50 LMT
Total	**100 LMT**	**100 LMT**

Against the target of 36.25 LMT in the year 2016-17, selection of silo operator for 37.5 LMT has been completed. Another 1 LMT has been sanctioned in the 2017-18. With regard to completion of 5 LMT of silo capacity in the year 2016-17, 4.5 LMT has been completed and 1.75 LMT silos have been completed in 2017-18.

(d) & (e): Government has been maintaining a dynamic buffer stock of upto 20 lakh tonnes of pulses. The Price Stabilization Fund (PSF) has been placed under Department of Consumer Affairs w.e.f. 1st April, 2016. The fund provides for maintaining a strategic buffer of agricultural commodities including pulses for calibrated releases to moderate price volatility, discourages hoarding and unscrupulous speculation. Government has procured 20.50 lakh tonnes of pulses, out of which 16.71 lakh tonnes was procured domestically and 3.79 lakh tonnes was imported. As on 21.12.2017, 17.05 lakh tonnes of pulses was available in the buffer after disposal of 3.45 lakh tonnes. Under the Price Stabilization Fund (PSF), procurement of pulses for central buffer is undertaken at market prices or Minimum Support Prices (MSPs), whichever is higher besides supplementation through imports.

In addition to PSF, to protect the interest of the farmers, Government implements Price Support Scheme (PSS) for procurement of pulses through Central Nodal Agencies at the MSP wherein State Agencies play a major role. This scheme is implemented at the request of the concerned State Governments, which agree to exempt the procured commodities from levy of *mandi tax*, assist procurement Agencies in logistic arrangements including gunny bags, provide working capital for State Agencies and creation of revolving fund for PSS operations etc. as required under the Scheme guidelines. The basic objectives of PSS are to provide remunerative prices to the growers for their produce with a view to encourage higher investment and production and to safeguard the interest of consumers by making available supplies at reasonable price with low cost of intermediation.

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Annexure-I
[Part (a) & (b) of Lok Sabha USQ No.2460 for 02/01/2018]

Table 1: Estimated monetary value of post-harvest losses

S. No.	Crop/ Commodity	Production (million tonnes)	Price (Rs/ tonne)	Over all total loss (%)	Monetary Value of the losses (Rs. Crore)	Sectoral total loss (Rs. Crores)
1	Paddy	104.40	17918	5.53	10344	**20698**
2	Wheat	92.46	17309	4.93	7882	
3	Maize	22.23	12662	4.65	1309	
4	Bajra	8.74	12666	5.23	579	
5	Sorghum	5.28	18456	5.99	584	
6	Pigeon Pea	3.07	49028	6.36	958	**3877**
7	Chick Pea	8.88	32838	8.41	2453	
8	Black Gram	0.83	48159	7.07	282	
9	Green Gram	0.46	60912	6.60	184	
10	Mustard	7.82	34820	5.54	1508	**8278**
11	Cottonseed	3.49	32275	3.08	347	
12	Soybean	14.68	36984	9.96	5405	
13	Safflower	0.10	26260	3.24	8	
14	Sunflower	0.58	32576	5.26	99	
15	Groundnut	4.75	31769	6.03	911	
16	Apple	1.90	68078	10.39	1341	**16644**
17	Banana	27.06	18601	7.76	3903	
18	Citrus	11.47	14011	9.69	1557	
19	Grapes	2.52	44564	8.63	969	
20	Guava	2.62	20628	15.88	858	
21	Mango	17.29	45355	9.16	7186	
22	Papaya	5.19	16023	6.70	557	
23	Sapota	1.50	18770	9.73	273	
24	Cabbage	8.53	10928	9.37	874	**14842**
25	Cauliflower	7.79	16321	9.56	1214	
26	Green Pea	3.87	33698	7.45	971	
27	Mushroom	0.04	119049	9.51	46	
28	Onion	16.66	16920	8.20	2312	
29	Potato	41.09	16649	7.32	5008	
30	Tomato	17.85	16510	12.44	3666	
31	Tapioca	7.32	22436	4.58	751	
32	Arecanut	0.53	182865	4.91	475	**9325**
33	Black pepper	0.05	570547	1.18	35	
34	Cashew	0.75	76026	4.17	239	
35	Chilli	1.31	64411	6.51	547	
36	Coconut	15.09	28587	4.77	2058	
37	Coriander	0.53	80506	5.87	249	
38	Sugarcane	338.96	2100	7.89	5614	
39	Turmeric	0.98	24845	4.44	108	
40	Egg	69.70	2634	7.19	1320	**18987**
41	Inland Fish	5.74	125306	5.23	3766	
42	Marine Fish	3.28	125306	10.52	4315	
43	Meat	1.30	350000	2.71	1235	
44	Poultry meat	3.90	150000	6.74	3942	
45	Milk	132.40	36000	0.92	4409	
Grand Total						**92651**

Source: Jha S N, Vishwakarma RK, Ahmad T, Rai A and Dixit AK (2015). Report on assessment of quantitative harvest and post-harvest losses of major crops and commodities in India. ICAR-All India Coordinated Research Project on Post-Harvest Technology, ICAR-CIPHET, P.O-PAU-Ludhiana- 141004

Annexure-II
[Part (c) of Lok Sabha USQ No.2460 for 02/01/2018]

Technologies developed by ICAR-CIPHET, Ludhiana since inception

Post-harvest Equipment / machines, tools and storage structures

1. Automatic Custard Apple Pulper
2. Automatic Litchi Peeler
3. Ber Fruit Grader
4. Castor De-podder and Decorticator
5. CIPHET-Aonla Pricking machine
6. CIPHET- Banana-comb Cutter
7. CIPHET-Cryogenic spice grinding system
8. CIPHET-Tomato Grader
9. CIPHET-Pomegranate Aril Extractor
10. CIPHET Fruit collector cum grader for saving of fruits
11. Fish Descaling Machine
12. Fish Processing Table cum Retail Sales Unit
13. Guar Seed Dehulling Machine and Process for Dehulling
14. Groundnut pod Decorticator
15. Groundnut pod grader
16. Hand Tool for Easy Separation of Arils from Pomegranate
17. Lotus seed decorticator
18. Low cost fish descaling hand tool
19. Low Cost Tray Dryer Having a Unique Design of Plenum Chamber
20. Mechanized System for popping and decortications of Makhana seeds (Gorgon Nut, *Euryale ferox*)
21. Mobile iced fish storage and transport chamber
22. Mobile agro processing unit suggested for cleaning, grading, destoning of food grains
23. Pilot Scale Millet Mill
24. Poultry Processing Table for poultry butchers and small poultry meat entrepreneurs and Poultry Slaughter Cone
25. Sunflower De-huller
26. Rotary maize cob sheller
27. Evaporative cooled room (2 ton)
28. Evaporative Cooled structure (5-7 tons)
29. Electric stunner for small animals
30. Ohmic heater for heating solid and liquid foods
31. Cryogenic spice grinder
32. Inclined draper type separator for separation of Berseem and Chicory Seeds
33. Bael/wood apple pulper
34. Carrier system for live fish
35. Root crop peeler
36. Sling animal lifter
37. Animal squeeze chute
38. Buckwheat de-huller
39. Cauliflower stem cutting machine
40. Hand-held mini fish scaler
41. Semi-automatic peeler for kinnow and sweet orange

42. Oat de-huller
43. Dehumidification system for storage of onion in EC room
44. Pneumatic assisted coring device for oblong fruits

Processes/Products

1. Dried Onion Flakes and Powder
2. Low cost technique for enhancement of shelf life of tomato
3. Method of determining maturity of intact mango in tree
4. Method of Predicting Maturity Stage and Eating Quality of Indian Mangoes using Near Infrared Spectroscopy
5. Modified atmospheric packaging of different vegetables
6. Minimal processing of Vegetables
7. Porous bricks
8. Production of dried ginger flakes & powder and paste.
9. Process technology for pomegranate jelly and grenadine
10. Production of carrot shreds and powder
11. Process for production of beetroot powder
12. Process of manufacturing mix for ready to constitute makhana kheer
13. Processing of Pomegranate and by-product utilization
14. Processing of ber for manufacturing of value added products
15. Processing of Aonla for manufacturing of value added products
16. A new process of oil extraction from Karanj seed (*Pongmia glabra*) through mechanical expression
17. Shrink wrap packaging of fruits and vegetables
18. Sunflower kernel based confectionary products
19. Modified atmospheric packaging of bitter gourd
20. Process for development of probiotic soy yoghurt
21. Starch isolation Process from pearl millet
22. Model for detection of soymilk as an adulterant in milk
23. Model for detection of urea in milk
24. Process protocol for clarified pear juice
25. Process of nutritious protein rich expanded snack food with ripe banana
26. Model for detection of Aflatoxin M1 in milk
27. Process Protocol for making soybean flour mix wadi

Value added Food products

1. Flax seed based Nutritious Energy bar
2. Groundnut Based Flavoured Beverage, Curd And Paneer
3. Pearl millet Based extrudates, pasta and weaning mix
4. Pearl millet based ready to reconstitute *upma and halwa*
5. Green chilli puree and powder
6. Anardana Ready to mix Chutney
7. Blended guava leather/bar
8. Ready to reconstitute mustard *(Brassica juncea*) Saag
9. Cattle feed from Potato Industry waste
10. Value added products from meat
11. Dried beetroot supplemented extrudates
12. Energy efficient Bengal gram S*attu* making technology
13. Aonla beverage

14. Digestive product from Anardana (Anardana Hazmhazam)
15. Sorghum-soy-blended biscuit
16. Ber preserves
17. Probiotic Peanut Yoghurt
18. Barnyard millet based muffins
19. Fibre rich bread using peanut hull flour
20. Quick cooking wheat *dalia*
21. Multigrain based high protein extruded products
22. Pearl millet and whey protein concentrate based Porridge
23. Corn based Nutritious Energy bar
24. Barnyard millet based muffins
25. Coarse cereal based nutritious extrudates
26. Protein rich extruded product using de-oiled ground nut cake:
27. Vegetable blended pasta
28. Antioxidant rich pasta utilizing beetroot and groundnut meal.
29. Carrot incorporated protein rich pasta and groundnut meal.
30. Groundnut and capsicum juice based protein and antioxidant rich pasta
31. Protein and minerals rich expanded snack food with spinach
32. Whey protein fortified mango RTS beverage
33. Quality protein maize based muffins
34. Development of nutritious muffins utilizing sunflower meal
35. Moth bean flour incorporated maize flour and *chapaties*

List of Technologies/ Machinery/units sold or established by AICRP on

PHET in Last Three Years

(A) Post-harvest tool/equipment developed

- Pumpkin cherry/tuty-fruity plant (pumpkin cutter, slicer, cuber): 100 kg pumpkin/day
- Pumpkin seed dehulling
- Papad cutter
- Peeler for safedmusli
- Small capacity amaranth thresher
- Detacher for Roselle calyces
- Walnut kernel separation machine
- Small poultry processing plant
- Continuous carrot washing machine in collaboration with entrepreneur
- Apple seed corer (hand operated and paddle operated)
- Power operated pepper decorticator
- Equipment for exposing carrots to UV radiations
- Centrifugal Cashewnut sheller
- Apple seed corer (hand operated and paddle operated)
- Apricot stone decorticator and dust separator
- Power operated pepper decorticator
- Multimode dryer (designed) for drying of grapes, fig and chilli
- Continuous solar powered milk sterilizer
- Continuous low cost turmeric washer
- Stripping machine for chick pea pod
- Steam boiling system for production of export quality iggery
- Mechanized paper sweet making machine for production of iggery fortified paper sweet
- Tamarind dehulling machine (Two pass multi-rings)
- Design of 2.5 ton capacity on-farm aeration bin for paddy
- Amaranthus popping unit
- Online grading system for mango
- Carrot de-hairing machines
- Carrot twig plucker
- Storage methods/structure for sharif onion
- Dryer for important spices of North Eastern States
- Pineapple harvester suitable for hilly region
- Gadget for making “pitha”
- Modified low cost storage system of iggery
- Vacuum based tank for iggery
- Refinement of inbuilt filtration system in
- Honey comb structured packaging material for fresh fig fruits
- Walnut dehuller
- Walnut grader
- Walnut bleacher-cum-washer
- Modified wax applicator for coating on passion fruit
- Modified/Improved maize dehushker-cum-sheller

- Ginger peeler
- A prototype green gram depoder-cum-sheller developed

(B) Design and development of structures

- Small scale fruit ripening chamber
- Rural slaughterhouse
- Small scale fruit ripening chamber
- Rural slaughterhouse
- Small poultry processing plant

(C) Pilot Plants

- Pilot plant for extraction of pectin from kinnow peel/waste
- Pilot plant for producti on of probiotic and iggery c juice from guava, kinnow and mango
- Pilot plant for solid and liquid iggery
- Pilot plant for extraction of pectin from apple pomace
- Value Chain of ginger primary processing

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