

Overview on Cold-chain Development (2015)

Summary of major support schemes

DAC - MIDH:

Mission for Integrated Development of Horticulture provides credit linked back ended assistance to attract private companies for the creation of integrated post-harvest infrastructure, including setting up of cold storages, modern pack-houses, transportation, processing units, ripening chambers and retail infrastructure. Subsidy @35% of the admissible cost in general areas and @50% in case of hilly and scheduled areas is provided to beneficiaries.

MoFPI

Ministry of Food Processing Industries implements a scheme under which financial assistance (grant-in-aid) @50% of admissible cost in general areas and @75% in difficult areas subject to maximum of Rs. 10.00 crore / project is availed. MoFPI is also providing grant-in-aid for development of common infrastructure for mega food parks, upto 50 crores. The common infrastructure has cold-chain infrastructure components.

APEDA

Ministry of Commerce through Agricultural & Processed Food Products Export Development Authority (APEDA) also provides assistance to private companies @ 25% for setting up infrastructure including specialised pack-houses, reefer transport and cold stores as perishable cargo centres.

DAC - ISAM:

Integrated Scheme for Agricultural Marketing (ISAM), through the sub-scheme Agricultural Marketing Infrastructure (AMI), subsidy is available for construction of cold storages when created as part of Integrated Value Chain (IVC) Projects. Subsidy @33.33% in case of North Eastern (NE) States, Sikkim, Andaman & Nicobar and Lakshadweep Islands, hilly areas, Registered FPOs, Panchayats, Women, SC/ST entrepreneurs & their cooperatives and Self-help groups. Subsidy is @25% for all other categories.

Concessions in Duties Taxes

- Excise Duty is exempted for specified equipment used for installing cold stores and/or transport;
- Exemption from basic customs duty for refrigerated vans/trucks;
- Concessional custom duty for equipment used for initial installing or expansion of a cold storage, cold room, processing, etc.;
- Service Tax exempted for 'pre-conditioning, pre-cooling, ripening, waxing, retail packing, labeling of fruits and vegetables', 'Erection, Commissioning or Installation' of cold storage and transport, cold-chain services of storage, handling and transporting of agriculture produce;
- Tax Deduction on 150% of the capital expenditure incurred for setting up and operating a cold-chain facility (IT Act section 35AD);
- Profits and gains free of Income Tax for first 5 years for a cold-chain facility, and 25% rebate for the next 5 years (IT Act section 80-IB(11)).

Others

- Low interest loan from Warehousing Infrastructure Fund (NABARD).
- Options to avail of Negotiable Warehouse Receipt as per WDRA norms.
- 100%FDI through automatic approval route & ECB route open.



Knowledge Support

- NCCD has published the Minimum System Standards and Infrastructure Guidelines to guide users and development agencies. The guidelines include recommendations and provide scope for users to innovate and indigenise applications to suit requirements. Cold-chain is a modern and science based aspect of Post-Harvest Management and this document allows for this sector to develop in a future ready manner.
- NCCD published study to provide an assessment of current and future requirements for cold-chain. The demand linked study adopted an inverse approach to analyse and link consumption of perishables with the cold-chain delivery mechanism, and is a first such ever such undertaken. The document, "All India Cold-chain Infrastructure Capacity (Assessment & Gaps)". The document provides insights into volumetric demand at urban centres and gives information on how to meet such demand if using the cold-chain. The concept of cold-chain as a supply chain, its differentiation and alignment with other businesses, the variance and synergy in product parameters and an understanding between size vs capacity can be reviewed in this document.
- A Nodal Officer for Cold-chain Development (NOCD) has been nominated by the majority of States to facilitate as a one stop access to understand government support. National Horticulture Board, as a part of MIDH, has offices nationwide to serve as a technical support group for implementing of cold-chain projects.

Cold-chain Capacity Status

A. Cold-chain Infrastructure

1. Capacity of 32.86 million tons in cold storages is as of 31-July-2015.

As per recorded data from concerned Ministries, the cold stores created in the country amount to a capacity of 32.86 million tons in size, about 7129 in numbers. This capacity does not account for other storage created exclusively for captive use by users - e.g. abattoirs, hotels, food processing factories. As per a recent baseline census undertaken, 1219 cold stores of estimated 5 million tons in size, were found permanently closed/not available.

As per the study, 'All India Cold-chain Infrastructure Capacity (Assessment of Status & Gap)', the country should optimally require cold stores in form of bulk stores and distribution hubs, amounting to 35.1 million tons in size.

2. Modern pack-houses created in the country are 250 in numbers.

The current consumption patterns of perishable foods in the country are bereft of fresh produce which have been preconditioned at modern pack-houses and has benefitted from organised movement in the cold-chain. A recent study by NCCD evaluates a shortfall of almost 70,000 pack-houses¹. A small concentration of pack-houses has brought global momentum to India's grape sector, much like milk-chillers at village level were key to the Milk Revolution.

The gap of 70,000 pack-houses indicates an average need for one between very 10 villages. This evaluation indicates that the cold-chain backend is underdeveloped and large investment needs to flow into rural India, at village level.

¹ NCCD.2015. *All India Cold-chain Infrastructure Capacity (Assessment of Status & Gap)*



3. Refrigerated transport has been underdeveloped with an estimated 9000 reefer vehicles in the country and zero reefer containers for rail movement.

Pack-houses can be justified only with associated link in form of transport. To fulfil the agenda of a second green revolution, cold-chain will need be a driving force. Without transport, the physical movement of perishable foods is constrained, and there is no integrity within the cold-chain. Transport options in form of reefer containers and reefer trucks therefor become the next most important step to developing an end-to-end delivery system in the cold-chain. A shortfall of this segment, continues to promote capacity overruns in in form of cold storages focused on single commodity crops like potato, dried chilly, seeds, apples. It also tends to promote designs that support commodity trading or price arbitrage that favours a demand supply mismatch.

According to the, 'All India Cold-chain Infrastructure Capacity' study, there is an associated requirement of 62000 refrigerated transport units in form of vehicles or multi-modal containers. Most of the current capacity (actively refrigerated trucks) is deployed for frozen processed foods (ice-cream, frozen peas, meats), pharmaceutical sector and imported foods. The domestic supply of fruits and vegetables is not catered to, largely because the shortfall of pack-houses does not induct them into the cold chain in the first place. An additional 30-40,000 vehicles (non-refrigerated) are estimated in use for milk and fresh fish movement.

Recent surveys indicate that although most of the cold storages facilitate transportation of commodities, 79% don't own any transportation. It can be perceived that transport is going to increasingly be the main bottleneck to maintaining the integrity of the cold-chain, along with modern pack-houses as points of origin for fresh farm produce.

4. Last mile Infrastructure for retail and distribution.

In developing a greater flow of preconditioned farm produce, the cross-geographical food supply chain would also require to be linked at the last mile. The NCCD study indicates a need to develop an additional 8000 ripening chambers, and large numbers of merchandising platforms in form of temperature controlled cabinets. An equally large number of city delivery vehicles can be estimated.

Summation - Infrastructure

Type of Infrastructure	Infrastructure Requirement (A)	Infrastructure created (B) ²	All India Gap ³ (A-B)	Gap % (B / A)
Pack-house	70,080 nos.	249 nos.	69,831 nos.	99.6%
Reefer Vehicles	61,826 nos.	9,000 nos.	52,826 nos.	85%
Cold Storage (Bulk)	341,64,411 MT	328,67,458 MT	22,33,204 MT	6.3%
Cold Storage (Hub)	9,36,251 MT			
Ripening Chamber	9,131 nos.	812 nos.	8,319 nos.	91%

All India requirement for refrigerated transport units (vehicles or multi-modal containers) is 61,826 units of carrying capacity of 10 tons each. Variations as per localised and business needs can be expected in estimated numbers.

² Information on infrastructure created is updated from records as of 31-July-2015.

³ NCCD.2015. *All India Cold-chain Infrastructure Capacity (Assessment of Status & Gap)*



B. Plan of Action to improve Post Harvest Management:

- 1. The Mission for Integrated Development of Horticulture (MIDH) was launched in 2014 with its thrust area being Post Harvest Management & Markets Development.**

Under MIDH, PHM and markets is a thrust area and allocated the highest priority and cold-chain development is at the forefront of its State level annual Action Plans.

- 2. Critical missing links in cold-chain infrastructure were identified and operational guidelines for XII Plan have incorporated strategic support for such components, under MIDH.**

Key infrastructure components and missing links in cold-chain along with components that impact on the operational efficiency of cold-chain were identified. Suitable changes were made and new components added to the central support from Ministry of Agriculture & Farmers Welfare in the MIDH scheme. This changes include:

1. Integrated pack house as new component.
2. Precooling unit with revised norms.
3. Cold room (staging) as new component.
4. Cold storage units with revised norms.
5. Refrigerated transport with revised norms.
6. Ripening chamber with revised norms.
7. Fifteen add-on equipment for technology induction as new components. These include Multi-modal refrigerated containers, packing lines, handling equipment, Solar powered and alternate energy options.

- 3. MIDH incentivises private entrepreneurs and upcoming Farmer producer organisations. Under its umbrella, NHB is assigned the task to projectise large sized initiatives including rail links. State missions provide support to a combination of smaller sized projects.**

The MIDH centrally support scheme has been incorporated in the action plan of all the States. Integrating cold-chain with other horticulture development is a focus area. Transport and market creation is emphasised.

4. Other Initiatives

- a. Nodal Officers for Cold-chain Development (NOCDs) have been nominated at States. These officers have undergone capacity building trainings through NCCD. The Nodal Officers shall serve to locally address concerns of cold-chain developers and liaise with Ministry of Agriculture & Farmers Welfare for possible redressal of these concerns.**
- b. Subsidy Process streamlined, doing away with need of LOI from government body. Now any beneficiary with a bank sanctioned loan can apply for subsidy which is provided to offset the credit burden.**
- c. States have delegated greater powers to sanction cold-chain projects so as to fast track the support mechanism.**
- d. Capacity building and workshops by government and industry bodies have been increased for benefit of various user sectors.**



C. Losses incurred in perishable produce

1. CIPHET report published in 2015, estimated losses ranging from 4.58% to 15.88% in selected fruits and vegetables.

As per (Centre for Post Harvest Engineering Technology) CIPHET report published in 2012, the food losses ranged from 6% to 18% in selected fruits and vegetables. This report was based on a nationwide sample survey conducted during 2005 to 2007. In a later study in 2015, CIPHET reported that the post-harvest loss among the same fruit and vegetables were reduced, and ranged from 4.58% to 15.88%.

The reports were based on surveys conducted in 120 selected districts. The loss incurred during transportation from producing region to consumption centres was not assessed and measures were isolated at aggregation and wholesale end of activities.

The losses indicated in the study, include the status while the produce is in the cold-chain or at ordinary warehouses. This study did not differentiate between losses within or without the cold-chain and hence there is no comparative assessment on losses that can be directly attributed to lack of integrated cold-chain.

2. FAO's 2014 study⁴ reports that 115 Kgs per capita per annum food is lost in South & South-eastern Asia before reaching consumer.

The loss translates into an estimated 2,700 lakh tons of food produced in this region. Worldwide, the report suggests losses incurred are in the range of 30% of harvest. The losses reported includes all food grains and fruits and vegetables and does not differentiate losses within or without a cold-chain.

Summation - Losses

- There is no comprehensive study at hand that differentiates between losses within the cold-chain and outside the cold-chain. However, pragmatic reports from established operations indicate that the majority of losses can be mitigated through use of cold-chain connectivity. Experienced stakeholders inform that in well managed cold-chains, losses incurred are minimal (~5%), provided the supply is continually linked with markets, and with shelf deliveries well within the enhanced holding life
- Developing of cold storages alone cannot mitigate the losses incurred by domestic perishable produce, unless other infrastructure like pack-houses and transport are also associated to avail connectivity with consumption areas. Static inventory will also suffer loss unless safely delivered to end-users.
- As a modern supply chain system, the cold-chain needs to be developed to serve as a future ready intervention, to open multiple markets, thereby reducing further scope of any loss that is incurred due to limitations in reaching out to consumers.
- Integrated cold-chain has a far greater boost to farm-level productivity. By countering perishability and bridging farms with cross regional markets, the cold-chain empowers the producers by allowing them to expand their market reach. Physical access to more markets, adds to revenue options and this in turn justifies further focus on productivity and production.

⁴ HLPE, 2014. *Food losses and waste in the context of sustainable food systems* by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome 2014.



Table I: All India requirement for static infrastructure

<i>As of 31-7-2015</i>						
Region	Cold stores created		Cold stores Requirement		Other Requirement	
	Number	Existing (MT)	CS Bulk (MT)	CS Hub (MT)	Ripening units (MT)	Pack-houses (Units)
And' & Nicobar (UT)	2	210				
Andhra Pradesh	419	1652737	4,89,195	41,730	4,070	3,124
Arunachal Pradesh	2	5000	6,705	803	78	60
Assam	35	126179	61,185	10,811	1,054	809
Bihar	304	1411395	50,94,524	29,458	2,873	2,205
Chandigarh(UT)	8	14588				
Chattishgarh	98	475746	4,98,724	15,106	1,473	1,131
Delhi	97	129857		40,122	3,913	3,003
Goa	29	7705		2,271	221	170
Gujarat	625	2323175	21,74,886	64,590	6,299	4,835
Haryana	309	646570	2,17,754	22,641	2,208	1,695
Himachal Pradesh	37	60650	3,04,511	1,636	160	122
Jammu & Kashmir	33	93976	8,99,220	8,622	841	645
Jharkhand	56	221680	5,228	19,723	1,923	1,476
Karnataka	193	539314	1,51,695	58,618	5,717	4,388
Kerala	197	78355	968	44,906	4,379	3,361
Lakshadweep(UT)	1	15				
Madhya Pradesh	275	1168321	18,18,134	49,045	4,783	3,671
Maharashtra	555	762797.6	34,200	1,23,509	12,045	9,245
Manipur	1	2175	2,925	2,137	208	160
Meghalaya	4	8200	17,228	1,476	144	110
Mizoram	3	3931	7,508	1,412	138	106
Nagaland	2	6150	7,142	1,533	149	115
Odisha	120	366699	2,88,328	17,172	1,675	1,285
Puducherry (UT)	3	85				
Punjab	619	2063007	16,67,984	25,424	2,479	1,903
Rajasthan	158	495888	11,370	42,025	4,098	3,146
Sikkim	3	2100	2,145	476	46	36
Tamil Nadu	165	304771	1,09,005	85,635	8,351	6,410
Telangana (see AP)			2,48,130	28,999	2,828	2,171
Tripura	14	45477	5,925	2,629	256	197
Uttar Pradesh	2215	13835743	105,65,506	1,09,631	10,691	8,206
Uttarakhand	40	101739	65,208	7,723	753	578
West Bengal	507	5913222	94,09,081	71,848	7,007	5,378
UT & Others subtotal	12	12,526		4,539	443	340
	7129	328,67,458	341,64,414	9,36,250	91,306	70,080

Requirement of transport units is not linked to locations as transport is expected to link across geographies. All India requirement for transport units is 61,826 units of carrying capacity of 10 tons each. Variations as per local need can be expected.

