



सत्यमेव जयते

Government of India
Ministry of Agriculture
Department of Agriculture and Cooperation



National Centre for Cold-chain Development

Issue 2 | April 2014

Newsletter





The CEO's Desk

Since our last edition, the National Centre for Cold-Chain Development (NCCD) has enhanced its team strength. Our newest teammates now include Rajagopal Sivakumar and Vanshaj Kaul. Read their introduction in this issue.

In the previous month, NCCD were host partners for an international workshop on cold-chain development in the Asian region. The weeklong conclave was a sharing of experiences between 13 countries on matters of cold-chain development.

April witnesses the launch of the Mission for Integrated Development of Horticulture (MIDH), a centrally sponsored support mechanism that will infuse nearly ₹ 17000 crores to promote horticulture, in the XII Plan period. The major thrust area for this Mission is post-harvest management infrastructure so as to develop demand linked supply chains.

All this bodes well for farmers, entrepreneurs & investors involved in the cold-chain sector and foretells more involved activities for NCCD & its members. Read more in this newsletter.

With contributions from our participant members, the editorial team will be putting forth explanatory articles about cold-chain; the technology, business models, concepts and more.

-Pawanexh Kohli

From the Editorial Team

Group 1: Southeast Asian countries: Cambodia, Republic of China, Fiji, Indonesia, Korea, Malaysia, Philippines, Thailand

Activity step 2	Objectives/features/topics	Target participants	Responsible party/Convenor
Training on technology on CCS	Types of CCS Design and construction of facility Time-temperature	Government, farmer, Coop, Private sector, Academia, Financial institution	Ministry of Agriculture and Cooperatives Local NPC, private sector
Promotion of CCS (fair, convention, event, etc.) year round	To create awareness and benefits on CCS Develop networking	Farmer, government, private sector	APO, government, private sector
Set up the NCCD in each country	To establish and implement CCS in each country	Farmers, private sector	Government

Part of action plan recommendations by Delegation members

Our previous issue was responded to with encouraging remarks by some of our readers and many constructive suggestions have been put forth. For future editions, we invite specific knowledge sharing articles from our member stakeholders. An Op-ed column will be started.

We continue to welcome your avid remarks & views and to use them to improve our efforts.

-Editor of the month

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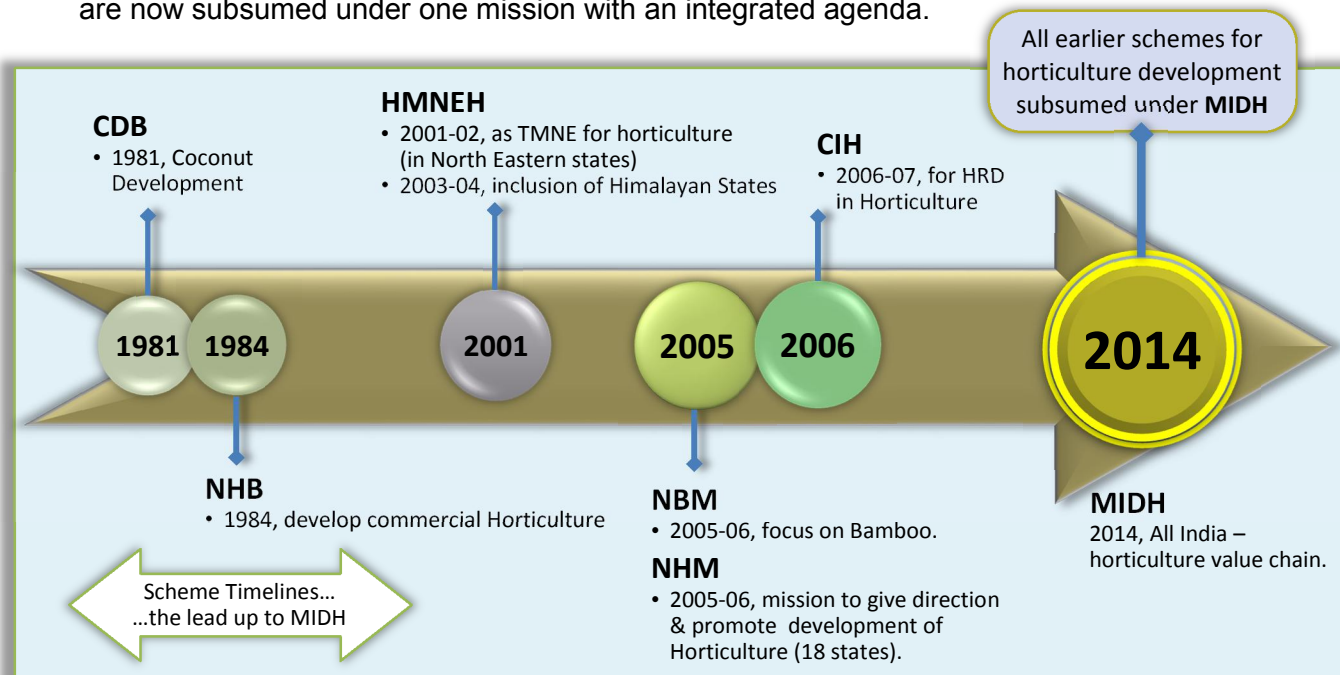
OP-ED INVITATION:

Article submissions from readers will be nominated by the editorial team as Op-Ed topics. Readers are invited to write in, articulating their ideas & concepts.



MIDH LAUNCH

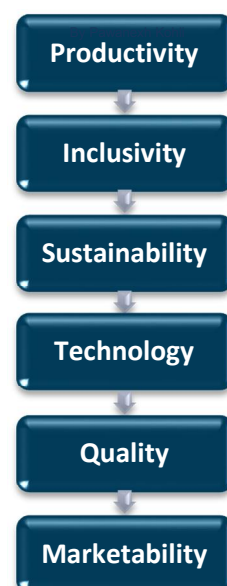
The start of April 2014 witnessed the launch of the Mission for Integrated Development of Horticulture (MIDH). From February, every State & Union Territory across the country was preparing and validating action plans, prior to initiating this focused centrally sponsored scheme. MIDH is to promote holistic and integrated development of the horticulture sector, encompassing value chain aspects such as inputs, quality, resources, supply chain and market linkages. Various standalone schemes that earlier functioned to develop this sector are now subsumed under one mission with an integrated agenda.



MIDH incorporates the Coconut Development Board, National Horticulture Board, National Bamboo Mission, Central Institute of Horticulture and the erstwhile National Horticulture Mission and Horticulture Mission for North Eastern & Himalayan States. MIDH will utilise these resources under a unified approach for holistic development of the sector. The programs are designed to enhance productivity, promote inclusion of small & medium farmers, focus on environmental and commercial sustainability, improve use of technology and to link quality to marketability of horticulture produce.

Cold-chain is a thrust area under this strategy; as a market linked supply system and as the agent that empowers farmer-producers by providing them options to counter perishability and maintain saleable quality. Since cold-chain requires specific processes even at point of origin, the credit linked subsidies under MIDH include modern pack-houses, packaging lines, staging cold rooms and multiple transport types, besides cold storage units.

Specialised equipment like dock levellers & racking systems to promote unit load handling are add-on components, to promote safe handling of produce. CA technology for cold stores is supported as another add-on. Also added are program logic controllers with control equipment so as to upgrade automation and energy savings. For a complete list of components, readers may like to review MIDH guidelines on our website or at www.midh.gov.in



Strategic Areas for Integrated Development

COLD-CHAIN INSIGHTS

By Pawanexh Kohli

When asked about the cold-chain, most people relate it to the system of storing food and medical goods under temperature controlled conditions. In effect, the oft perpetuated lack of cold-chains in India, is instantly related to a deficit in capacity of cold storage infrastructure. A recently published snippet in a newspaper stated that the lack of cold warehouses was sole cause of food waste and insisted that there be greater focus on storing of farm produce. This stems from a lack of understanding of what all integrates into a cold-chain, and through a series of articles in this newsletter we will try and build an understanding of various aspects of cold-chain. Warehousing alone must not be confused with the cold-chain solution.

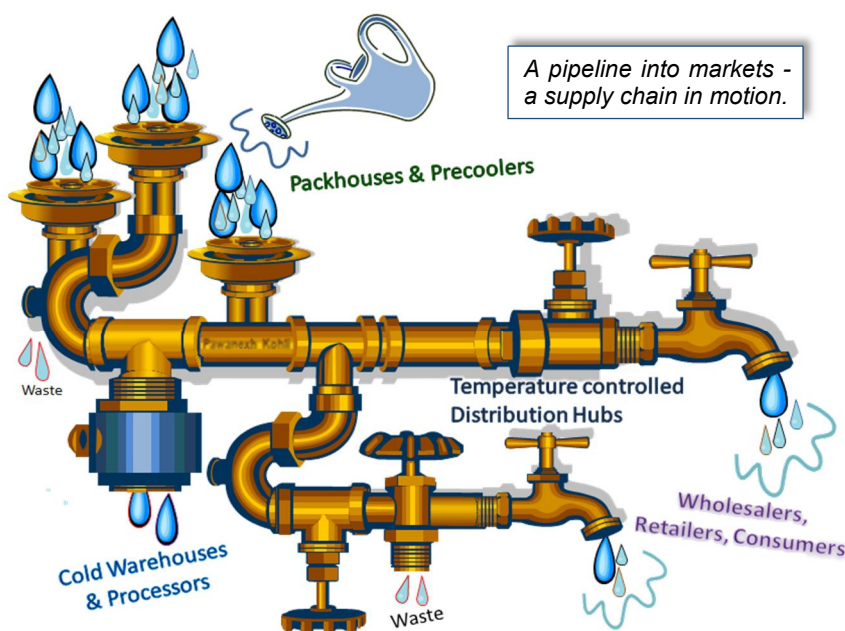
Our first focus is on the cold-chain needs for fresh farm produce, not only because it is the most bandied user segment but also because it is the most intricate & most misunderstood.

Fresh farm produce largely means horticulture (fresh fruits and vegetables), but can include fresh milk and eggs. It means harvested food items, that have not undergone any controlled intervention wherein ingredients are added to change the base structure or the natural perishability of the produce. For example, milk after undergoing the process of pasteurisation, would not truly fall in this category, as its base composition is changed; whereas raw milk would. Similar is the difference between boiled eggs & fresh eggs, or live fish versus smoked fish.

Fresh produce is by nature, highly perishable as natural intrinsic living physiological activities continue unabated—and the cold-chain for this segment, serves not to stop this life cycle, but to retard or slow it down. The cold-chain is mainly employed to affect increase in longevity... and it will always fail, since all life must end! Cold-chain hence, only buys transitory time, and its prime effort should be to utilise this time to connect with markets and consumers.

Storing of produce at farm-gate ought to be done with the foremost aim to connect into & to expand the ensuing supply chain. Barring a handful of fresh produce types, >95% of horticulture must see the cold-chain as a flowing conduit from farm to consumers, not merely as a medium to stock longer term inventory. Long-term storage is applicable to certain hardy produce types only, like potato, apples, spices, seeds and alike. Such storage may serve in case of processed foods where an expiry date or term has been predetermined. For fresh produce with inherent short life perishability, just like we did in case of milk, the cold-chain must stretch out and not merely serve as static storage. In such cases, cold stores are viewed as staging hubs, with a moving inventory, in haste to reach markets.

Cold-chains worldwide are the most feasible & viable solution to extend the selling range of farm produce. Without cold-chains as enablers, producers of fresh produce were limited to selling within a radius immediate to the source farms. The true intervention that is cold-chain, is its ability to empower producer/owners to link & sell into multiple, distant markets... asap!



....to be continued

ASIA DISCUSSES COLD-CHAIN

From 23rd to 27th of March 2014, thirteen nations of Asia gathered at India International Centre, New Delhi to debate and assess the status of cold-chains in their countries and to formulate action items basis their learnings after five days of deliberations.



This, first such workshop, was organised by Tokyo based Asian Productivity Organisation (APO) with India's National Productivity Council (NPC) and NCCD. The global participants were keen to emulate many of the initiatives undertaken in India. The delegation also visited the cold distribution centre of MJ Logistics (an NCCD member) at Palwal and greatly appreciated this modern facility.

Most notably, a recommended action point was that a "NCCD" also be set up in their own countries. Such action will greatly add to collaboration efforts in this sector and NCCD will be happy to support such an initiative. The countries participating in this event were Cambodia, Fiji, India, Indonesia, Iran, Japan, Korea, Malaysia, Nepal, Philippines, Republic of China, Sri Lanka and Thailand. APO had resourced expertise of individuals from India, Japan & USA.

Read coverage in April edn of **Logistics Times: Cover Story**



Delegation debates on concepts and action plans



National Centre for Cold-chain Development

Ministry of Agriculture, New Delhi || www.nccd.gov.in || contact-nccd@gov.in



WELCOME NEW TEAMMATES



Advisor Technical

Rajagopal Sivakumar

One of the better known members in the industry, he has notched up more than 20 years of professional expertise in the field of refrigeration. Most importantly, he is an ardent activist for the integrating of activities that comprise holistic cold-chains. He has managed cold-chain infrastructure projects across Planning, Designing, Engineering and Commissioning. He last worked for Voltas Ltd., as Senior Manager. A qualified M. Tech (Thermal Engineering) he comes with global experience in this field.



Executive Manager

Vanshaj Kaul

A proactive and dynamic person, in a very short period he has an invigorating impact at NCCD. He comes with 5 years professional experience in managing field projects, with a mindset focused on implementation. He last worked for Jain Irrigation where he was managing their north India region solar power projects. He is a qualified engineer - B.Tech (Electronics Instrumentation) with MBA (Operations Management).

NCCD GLOSSARY OF COLD-CHAIN

This shall be a regular feature in the newsletter where terms used commonly by NCCD, as other colloquial terminology, shall be explained so as to standardise the vocabulary in cold chain.

Cold-chain: the series of activities and procedures that perishable goods are subject to, from source of raw material to a production facility or to end consumer. Cold-chain is not only refrigerated storage and transport but as a supply chain, it must also include a point of origin – a production unit such as a horticulture pack-house, an ice cream factory, an abattoir or a vaccine manufacturing facility. Of these, a shortfall of pack-houses results in disallowing various produce types to even enter the cold-supply-chain.

In case of most horticultural produce, cold-chain involves essential post-harvest handling processes like sorting, grading, trimming, de-sapping, fumigation, washing, waxing, packaging and labelling prior to entering energy application phase of environment control. These activities are not typically under purview of the farmer but have a direct impact on the cultivator/producer and on the efficacy of the cold-chain. These activities can also trigger multiple post-harvest supply lines – to nearby mandis, to distant markets, to food factories. These handling processes carried out by cold-chain initiators are not to be confused with the production based activities in food processing factories. The latter is akin to manufacturing process, wherein fresh farm produce is utilised as a raw material to output it in an altered form as a finished food product. A manufactured food product is subject to different food safety and taxation laws from those that regulate harvested fresh produce.

Nodal Cold-chain Officers, are being nominated by State Governments to coordinate with NCCD & the Ministry for cold-chain development. The list of these officers shall be printed in the May edition.

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Executive Connection (Mar-2014)

USDA funded a first ever event to connect 30 senior cold-chain professionals in China. The Cold Chain Executive Connection was organised by GCCA (Global Cold Chain Alliance) as part of larger efforts to build and strengthen temperature-controlled supply chains worldwide.

Cold-chain on Rail (Mar-2014)

Russian Railways Logistics completed successful trials for cold-chain services across Eurasia. The cargo was shipped from Chongqing to Duisburg in insulated & refrigerated containers with integrated diesel generators. Shipment took 16 days, crossing 6 nations of Asia & Europe.

FRESH PRODUCE FACTS

- ◆ Fresh fruit & vegetables are living tissue. Even after harvest, they continue live and to breathe. This respiration produces carbon dioxide, water and heat and causes ageing or deterioration of quality.
- ◆ The rate of ageing of the produce is largely determined by the rate of respiration. Respiration can be slowed to minimise effects of ageing but respiration can never be completely stopped or the produce dies.
- ◆ The rate of respiration is temperature dependent. Produce when kept cool will have a lower rate of respiration and lowered rate of deterioration. However, produce, which is actively cooled, will also need to be provided air and water to sustain its life. When alive, the produce can deter disease and decomposition.
- ◆ Different products have different rates of respiration. Those with higher rates are more highly perishable and cold-chain management is more critical for these produce types.
- ◆ Keeping produce cool reduces the production of ethylene. Further, cooled produce is less sensitive to ethylene.



TERMINOLOGY IN RELATION TO COOL-CHAIN

Terms and underlying concepts will be explained in the preceding column in future newsletters.

3PL – 3 rd Party Logistics	External Temperature Cycle	Protocol
4PL – 4 th Party Logistics	Extruded Polystyrene	PSA type N2 generator
Acceptance Criteria	FEFO / FIFO / LIFO	Pull Down
Air curtain	Field heat	Qualification
Air hole	Fin coil	Reconditioning
Air replenishment	Flashing	Reefer
Allowable Excursion	Food Miles	Refrigerant
Ambient Temperature	Food Processing	Respiratory Heat
Analytical Thermal model	Food Product	Return Air
Ante-room	Fresh Produce	Ripening
Blast Freezing	Forced Air cooling	Rock wool
Bottom vents	Freezing damage	Room Cooling
Box vents	Fresh air bleed vent	Room temperature
Broken Stowage	FSSA / FSMA	RTC / RTE
BTU / Ton Refrig	GDP / cGDP	R-Value
Bunker coil	Gel Pack	Secondary cooling
Calibration	Grading	Senescence
CFC	Green Grid for perishables	Set Point
Chill / Mild chill / Frozen	GWP	Shelf Life
Chill Injury	HAACP	Short haul van
Chill Pack	HCFC	Shoulder vents
Chiller	Heat Load	Shrinkage
Climacteric	Heat recovery wheel	Sorting
Clinical Trial	Heat seal	Stability
Cold Chamber	Hot pocket	Stacking
Cold Merchandising	Hot spots	Staging Cold room
Cold storage	Humidifiers	Storage
Cold supply chain	Hydro-cooling	Storage Life
Cold-chain Management	Hydrovac cooling	Storage Temperature
Cold-chain Packaging	Ice Test	Stowage
Cold-chain Product	Icing	Strip curtain
Cold-chain Solution	IDU	Supply Air
Compressor	ILR	Tainting
Computational Fluid Dynamics	Infiltration Load	TCL
Conductive Heat Transfer	Insulation	Thermal Bank
Controlled Atmosphere	IQF / Belt freezer	Thermal Expansion valve
Convective Heat Transfer	K-Value	Thermal pallet blanket
Cool Blanket	Line haul vehicle	Thermal Bridge
Cross Dock	Membrane type N2 generator	Thermal Inertia
Cryogenic	Milk Run	Thermal Slab
Data Acquisition Units	Modified Atmospheric Packaging	Thermo-chromic
Data Logger	ODP	Thermo-couple
De-frosting	ODU	Tongue & groove (cam /clip lock)
Distribution Temperature	Ostwald ripening	Top Icing
Dock Leveler	Pack house	Top vents
Docking Bay	Package-Icing	TOR
Dolly	Pallet enabled	Transpiration
Dry Ice	Passive Cooling	TT Abuse
Dunnage	PCC	TTI
Duration Index	Phase Change Material	Vacuum Cooling
DX Cooling	Plate Freezer	Vacuum test
Edible film packaging	Pneumatic Test	Validation
Efficacy	Polyurethane foam panel	VAR
Environmental Chamber	Post Harvest Handling	Vapour Barrier
Environcontainer	Post Harvest Life	VCR
Equalisation	Pre-conditioning	Vapour pressure
Eutectic	Pre-cooler	Ventilation Load
Evaporator	Pre-cooling	VIP
Expanded Polypropylene	Pre-Qualification	VVM
Expanded Polystyrene	Product Life Cycle	Wound healing

LUMINARY SPEAK



Shri Siraj Hussain, Secretary (MoFPI)

The latest report by the inter-governmental panel on climate change suggests by 2030, wheat production and food grains in India would decline by 5.8%. What could this foretell for food processing?

The impact of the climate change on food production is very complex, with near consensus that it may adversely affect the global agricultural production. Food processing industry is directly linked to the availability of raw material provided off agriculture. Hence, any adverse impact on agricultural production will also affect the food processing industries. However, climate changes may bring changes in lifestyle and food habits. New kinds of processed foods may evolve. Such positive impacts cannot be predicted as of yet.

Food processing industry creates many types of finished food products, some of which rely on cold chain to reach the consumers. Do you think this sector has the need to develop more market links through the cold chain?

Both backward and forward linkages are important for the uninterrupted temperature and climate controlled agricultural supply chain from the farm gate to the market. Majority of the processed foods require controlled temperature at the point of sale. The cold chain scheme of the Ministry of Food Processing Industries gives priority to those projects which invest more in creating backward and forward linkages including retail outlets.

Can you please share some highlights of the National Mission on Food Processing?

The basic objective of NMFP is decentralization of implementation of various schemes of the Ministry in which substantial participation and involvement of State Governments is ensured. The mission launched in August 2012 and all State Governments/UTs are empowered to receive applications, assess & sanction the financial assistance and release the grant-in-aid to the eligible beneficiaries. In the beginning, the Mission faced teething problems mainly because of inadequate institutional capacities. The mission is expected to gather momentum in this financial year. Now, the State Governments have gained some experience in processing and sanctioning the proposals received under the mission and some of them have done reasonably well in implementing the various component schemes under this mission.

How can NCCD members work with MoFPI to further strengthen cold chain development?

NCCD, being the nodal agency for development of cold chain in India, can collaborate with MoFPI to help create cold chain infrastructure in the country. The technical expertise available with NCCD can help in the technical scrutiny of the cold chain project proposals received in the Ministry. The Ministry may require various data and statistics on cold chain infrastructure, equipment, technologies, standards, etc. for strengthening its scheme of cold chain. NCCD, therefore, should guide the cold chain division of the Ministry in its endeavour of strengthening the cold chain infrastructure in the country.



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Op-Ed of the month



NCCD is an autonomous body set up by the Government of India with the aim to facilitate cold chain development across all user segments through policy intervention, capacity building and standardisation. NCCD has participation from private industry, policy makers, knowledge partners and government agencies.