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THE HINDU

Commodity prices

Bittergourd is turning very pricey this year. The price of this vegetable has surged over 28 per cent in the last year and is also up over 12 per cent in the last one month. A sharp decline in arrivals is a major factor that triggered the price rise. In Chennai, bittergourd is selling for ₹36 per kg, up from ₹28 per kg a year ago.

Here are the prices of various commodities in Chennai.

Price scale is given as Rs./kg

Commodity	Quantity	Now	Year ago
Rice	1 kg	28	32
Wheat	1 kg	32	30
Atta	1 kg	30	32
Gram Dal	1 kg	75	48
Tur Dal	1 kg	175	83
Urad Dal	1 kg	170	90
Moong Dal	1 kg	120	96
Masoor Dal	1 kg	100	75
Sugar	1 kg	32	34
Milk	1 ltr	37	27

Commodity	Quantity	Now	Year ago
Ground Nut Oil	1 ltr	125	105
Sun flower Oil	1 ltr	92	85
Gur (Jaggery)	1 kg	50	49
Tea	1 kg	220	220
Salt	1 kg	18	17
Lime	1 kg	80	100
Apple	1 kg	140	140
Papaya	1 kg	30	25
Pineapple	1 kg	50	40
Pomegranate	1 kg	140	120
Sapota	1 kg	50	40
Banana	1 kg	32	30
Bitter Gourd	1 kg	36	28
Brinjal	1 kg	40	28
Cabbage	1 kg	20	16
Cauli Flower	1 kg	50	40

Commodity	Quantity	Now	Year ago
Garlic	1 kg	140	120
Ginger	1 kg	100	140
Chilly	1 kg	32	38
Onion	1 kg	50	28
Potato	1 kg	28	36
Tomato	1 kg	32	10

*Source: Nathan Enterprises & Kovai Pazhamudir Nilayam, Chennai.

Coimbatore to become more greener



The 500 saplings created using the Miyawaki method, at the Park Institutions.

When CEO of Park Institutions Anusha heard about Guerilla farming at a TED lecture, she was fascinated. She learnt how urban spaces in several cities in the West were being used to plant herbs and vegetables. Little patches of green in the midst of all that concrete.

Then, she heard about the Miyawaki method of urban foresting.

“Growing trees is not new to our institution. Nearly 30 years ago we planted thousands of saplings at the Tamil Nadu College of Engineering and today the environment there is transformed from barren and dusty to green and lush. The trees are huge, birds abound and the temperature is at least a couple of degrees cooler. And there is less noise pollution,” she said.

Along with help from Young Indians, Forest College and Agriculture University, Park Institutions decided to become part of the Carbon neutral Campus project.

“For this we need a green cover. I heard how the Miyawaki forests grew quickly and in limited space,” she says.

So, on Dr. Abdul Kalam’s birthday the first 500 saplings were planted.

“We will plant the rest in a phased manner. This should reduce the carbon footprint of our campus,” says Anusha.

Seven native species were planted after the terrain was carefully assessed. The saplings, suitable to the rocky terrain of their institution were raised by Forest College. Anusha Ravi hopes at some suitable opportunity, she will be able to introduce Guerilla Farming too.

“It makes so much more sense to grow vegetables, herbs and fruits instead of having just lawns or ornamental plants. It enriches the eco-system.”

At K.S.G. College of Arts and Science, nearly 100 volunteers from the college’s National Service Scheme, launched a greening drive. Working with the advice of botanical experts, such as Viswanathan, a former professor of Botany at Government Arts College, and Paneerselvan, a former forest ranger, they have planted 100 saplings in 25-kg gunny bags (normally used to store rice) filled with quality earthwork manure.

“They will be carefully tended to for two years and then be transplanted into prepared pits,” says Karunamoorthy, a professor at the college.

The saplings are now safely ensconced in their gunny bag and kept close to a water source so that they will be watered and nurtured. Only native species have been planted, and more will be planted in a phased manner, says Karunamoorthy. The greening programme was launched on the birthday of Dr. Abdul Kalam by the correspondent of the college, K.S. Geetha.

Effort to turn campus green

The Sugarcane Breeding Institute of the Indian Council of Agricultural Research here has joined hands with the Tamil Nadu Forestry Department to green campuses.

The Tamil Nadu Forest Department’s ‘Tamil Nadu Bio-diversity Conservation and Greening Project’ that envisages taking up nurturing trees outside the forest areas was launched on the premises of Sugarcane Breeding Institute on October 19 by planting 600 saplings. All staff members residing on the campus, including the Director, planted a sapling each.

Bakshi Ram, Director of the institute stressed the need to keep the campus clean and green.

He said that all vacant spaces on the campus will be used to grow trees in a phased manner with the active participation of staff.

Participation of each staff member would ensure the success of the ‘Green campus initiative’, the Director of the institute added.

Training in agriculture

The Voluntary Association of People Service will organise a month-long skill development training for those who are above 18 years of age.

According to a press release from P. Someshbabu, Chief Operating Officer, the training will include field visits to a garden, bee keepers, sugarcane cultivator, micro irrigation technician and quality seed producer.

Interested candidates can contact the Programme Coordinator, VAPS, 39 Besant Road, Chokkikulam, Madurai 625002.

Phone: 0452 2538641, 2538642 and 8489727415.

Be ware of zinc deficiency, farmers told

The paddy growing farmers of Tuticorin district are expecting good rainfall with the onset of Northeast monsoon likely on October 27 and are busy preparing their field for the 'pisanam' season to ensure the best utilisation of rain and water from the Tamiraparani command area. Even though necessary inputs were applied, crop productivity depended on the availability of both major and micronutrients, which had to be evenly supplied from soil to the growing paddy crop, according to V. Subramanian, Dean, Agricultural College and Research Institute, Killikulam.

Of all micronutrients, zinc is considered the fourth most important yield-limiting nutrient in agricultural crops. It is one of the essential micronutrients for plant growth, especially paddy, under submerged condition. Hence, farmers should be aware of its importance and prevent any zinc deficiency, which is common worldwide, in temperate and tropical climates. The deficiency of zinc was found in more than fifty per cent of Tamil Nadu soil. Among all nutrients, zinc deficiency caused yield loss to a maximum of 30 per cent in paddy irrespective of varieties, Dr. Subramanian told *The Hindu* here on Thursday.

Soil was commonly associated with problems of zinc deficiency in paddy crop, mainly due to factors like neutral to alkaline reaction and high calcium carbonate content on top soil or subsoil.

When a nutrient element deficiency occurred, visual symptoms might appear and normal plant growth would be slowed down. Zinc deficiency in paddy could be noticed when supply of zinc to the plant was inadequate.

The inadequate content of zinc would hinder the nutrition and health status of people.

On corrective measures, he said micronutrient spray solutions should not be mixed with other chemicals used in farm practices. Moreover, application of sufficient quantities of organics would reduce or nullify the deficiency of zinc in soils.

Punjab farmers to get wheat seed subsidy

The Punjab government has decided make farmers avail certified wheat seed at 50 per cent subsidy for sowing in the rabi season.

Disclosing the decision here, an official spokesperson of the state agriculture department said that to facilitate the farmers, Punjab government has ensured all requisite arrangement to provide wheat seed at subsidized rates.

He added subsidy equals to the 50 per cent of total cost of seeds or to a maximum of Rs 1,000 per quintal will be directly transferred to the bank account of applicant farmers and subsidy on wheat seed will be provided for maximum of 5 acre area.

He further said the priority for providing subsidised seeds will be given to farmers having 2.5 acres area.

Officials told to prepare district irrigation plan for Tirunelveli

In order to calibrate the existing irrigation system

Officials attached to various government departments have been urged to prepare the 'district irrigation plan' to calibrate the existing irrigation system further for ensuring maximum yield and taking the available water to farms in the tail-end areas.

In a sensitisation programme on ‘Pradhan Mantri Krishi Sinchayee Yojana’ (PMSKY) organised at Rice Research Station, Ambasamudram recently, Sub-Collector, Cheranmahadevi, V. Vishnu, Coordinator of District Irrigation Plan project, told the officials to prepare the plan as mandated by the newly announced scheme as the main objective of this programme is ‘More crop per drop’ and ‘Water to the last field’.

In his introductory speech about the scheme to the participants, he explained the salient the features of the programme as the newly evolved strategy connects all existing irrigation schemes of the various departments.

Mr. Vishnu, one of the officials to undergo the training in the programme, said the officials should collect every data pertaining to irrigation system right from the village-level.

“While preparing the Plan, village-level details will be collected and consolidated into block-level plan, which will ultimately evolve as the ‘District Irrigation Plan’ that can be used to finetune the existing irrigation system for getting maximum yield and take the available water even up to the tail-end area,” Mr. Vishnu said.

For collecting the basic details, factors such as source of water, distribution of water, optimum use of water and increase in farm productivity, the water budgeting and water balance will be taken in to consideration, the Sub-Collector said, urging the officials to collect the basic details as early as possible.

He said that the important suggestions given by the various department officials and the local MPs and MLAs, panchayat presidents should be included in the plan.

Joint Director of Agriculture (in-charge), L. Perumal, in his welcome address, emphasised the importance of the scheme and told the officials to expedite the data collection process.

The Deputy Director of Agriculture, District Watershed Development Agency R. Rajasekaran, Deputy Director of Agriculture (Farmers Training Centre) Mary Amirthabai, Personal Assistant to Collector (Agriculture) T. Venkatakrishnan and officials from Departments of Horticulture, Agricultural Engineering, Public Works and Statistical Analysis, Assistant Directors of Agriculture, Agricultural Officers and Deputy Agricultural Officers from all the 19 blocks of the district were also present in the meeting.

Pre-monsoon sowing of crops done

Anticipating showers, pre-monsoon sowing of rain-fed crops such as maize, pulses, millets and cotton was done in dry land tracts of Kovilpatti, said D. Jawahar, Professor and Head, Agricultural Research Station, Kovilpatti on Wednesday.

“The normal rainfall at Kovilpatti during the northeast monsoon season is 386 mm for 20 rainy days. Out of the total rainfall, an average of 187 mm is received during October, 148 mm during November and 61 mm during December”, Dr. Jawahar told *The Hindu*.

Joint Director of Agriculture V. Jeyakumar said that 30,000 hectares each under millets and pulses and 5,000 ha under cotton is expected to be covered. Dr. Jawahar said that normally the onset of northeast monsoon is on October 20 and monsoonal rains would occur in spells of about three to four days.

The northeast monsoon is the major period of rainfall over south peninsula, particularly in the eastern half comprising coastal Andhra Pradesh, Rayalaseema, Tamil Nadu and Puducherry.

As for Tamil Nadu, the main rainy season accounts for about 48 per cent of the annual rainfall. Coastal districts of the State get nearly 60 per cent of the annual rainfall and the interior districts get about 40 to 50 per cent of the annual rainfall.

Need to waive farm loans highlighted

'It will help farmers overcome present financial crisis'

Farmers participating in the Raitha Dasara in Shivamogga on Wednesday.

Progressive farmer Dummalli Shivamma has urged the Union and the State governments to waive the loans taken by farmers from nationalised and cooperative banks.

Ms. Shivamma was speaking after inaugurating the Raitha Dasara, a programme organised for farmers as part of the Shivamogga Dasara at Kuvempu Rangamandir here on Wednesday.

The agricultural sector in Karnataka was facing a severe crisis owing to drought and slump in the prices of agriculture produce, including arecanut, pomegranate, silk cocoons and sugarcane. Farmers were in dire straits owing to these problems. It was obligatory on the part of government to rescue farmers at this period of crisis by waiving the loans, she said.

Ms. Shivamma expressed displeasure against the loan recovery policy being adopted by the banks. While industrialists, who had borrowed large sums were spared, the banks were issuing notices to small and marginal farmers, who have borrowed paltry sums of money. Farmers get perturbed by such bank notices and therefore resorted to take extreme steps, she said.

Addressing the gathering, Chairman of State Legislative Council D.H. Shankaramurthy said that farmers, who provided food security to the nation through their dedicated and relentless hard work, were facing financial crisis. It was necessary to ensure remunerative prices for agricultural produce and improve the financial condition of farmers, he said.

C. Vasudevappa, Vice-Chancellor of the University of Agricultural and Horticultural Sciences, Shivamogga, suggested the farmers to go for multiple-cropping to enhance their income. The price of paddy, that was being cultivated in vast tracts of land in Malnad region, had come down in

recent times. Farmers should therefore cultivate other crops that were suitable for the soil and climatic conditions of the region, along with paddy. In addition, it was necessary to develop an integrated approach towards farming. Along with agriculture, farmers should undertake diary farming, poultry farming and sheep rearing, he said. In the wake of labour shortage, it was necessary to mechanise farming, he said and stressed the need to integrate agriculture with school curriculum and thereby, create interest among students towards the subject.

Prior to the programme, farmers mounted on bullock carts, took out a procession through the main streets of the city.

Remunerative price is the right of farmers, says agriculture scientist

.N. Prakash Kammaradi addressing a seminar in Kolar on Monday.



Can earn more income by value addition, say farmers' leader

T.N. Prakash Kammaradi, agriculture scientist and chairman of Karnataka State Agricultural Price Commission has said that remunerative price for crops cultivated by farmers should be the right of the farmers. “Demanding minimum support price (MSP) compromises the self respect of the farmers who toil hard in the fields and it leaves them at the mercy of the governments. However, if the remunerative price was made the right of the farmers, they can work expecting the good returns for their yields”, Mr. Kammaradi said while addressing a seminar organised here recently.

Houlr Shankar Memorial Committee and Karnataka Prantha Raitha Sangha (KPRS) have organised the seminar to mark seventh death anniversary of farmers' leader Holur Shankar. Mr. Kammaradi said Centre and States should jointly take the responsibility of safeguarding interests of farmers while not neglecting the interests of consumers as well.

“Untill a legislation to this effect (remunerative price as a right) was evolved, the MSP should be given the statutory status,” he opined. Any price fixed by the governments should reach directly to the cultivators and it needs political will, he remarked.

All India Kisan Sabha (AIKS) joint secretary Viju Krishnan charged the Centre with backtracking on implementation of M.S. Swaminathan Committee recommendations.

Value addition suggested

The farmers should come forward to earn more income by taking up value addition activities to their produces such as mango and tomato, Mr. Viju Krishnan said. Forming cooperative societies is also necessary for achieving welfare of farmers, he added. Horticulture College Dean Nache Gowda, KPRS vice president G.C. Bayya Reddy and spoke.

A word of appreciation for farmers

“The calculation of production cost by the farmers of various crops at the seminar is a good initiative. It has eased the work of the Commission and will be taken in to account while submitting recommendations to the government. No other farmers' outfit did such a systematic work”. T.N. Prakash Kammaradi Chairman, Karnataka Agricultural Price Commission

Pulses being promoted: officials

INTERACTION:A farmer speaking at a grievance day meeting at the Collectorate in the city on Tuesday.— Photo: S. James

Expressing concern over the rising prices of pulses in markets, farmers from the district urged the district administration and the agriculture department to promote their cultivation, at the monthly farmers' grievance meeting here on Tuesday.

Asking about the steps taken by the district towards the same, M. Pandian, leader of the Tamil Nadu Farmer's Association, said that farmers had to be made aware of the benefits of growing pulses and asked for intercropping of maize and cotton with pulses to be promoted.



S. Radhakrishnan, consultant with the National Food Security Mission (NFSM), said that there were cluster demonstrations for black gram, green gram and mixed cropping of cotton crop with pulses in progress across the district.

“The NFSM is promoting cultivation of pulses by implementing these cluster demonstrations in 1,200 hectares at T. Kallupatti, Sedapatti, Chellampatti and Usilampatti blocks. The farmers are given pulse seeds, micro-nutrient mixtures, seed treatment chemicals, bio-fertilizers and weedicides at a subsidy of Rs. 4,000 per hectare,” he explained. He said that the farmers were educated on the use of the latest technology as well.

Taking the example of Tirumangalam where green gram was cultivated on 600 hectares, Mr. Radhakrishnan said that harvest was in progress and the farmers were expecting a yield of 450 kg per acre.

“The recent spell of rain helped cultivation of pulses and after the complete kharif harvest, we are confident that the availability and pricing of pulses in the district will improve,” said Joint Director of Agriculture (in-charge) Sarnath Babu.

Apart from the cluster demonstrations, the agriculture department also encouraged the cultivation of pulses in bunds of paddy fields covering 500 acres in Madurai East, Madurai West and Alanganallur blocks.

Samba cultivation gathers pace

Farmers raising different varieties in various regions in the district

Samba cultivation has started gathering pace with farmers raising different varieties in various regions in the district. An estimated 4,500 hectares is expected to be brought under the paddy cultivation during samba and thalady seasons put together.

Many farmers have raised the CR-1009 variety, followed by Vellai Ponni, ADT-46 and ADT-38 varieties.

While CR-1009, a long-term crop, had been raised earlier, the other short duration varieties are being raised now. Paddy is cultivated largely in Tirunallar, Ambagarathur, Nedungadu, Thennakudi and Vizhudhiyur.

According to sources, the weather forecast that the North East monsoon would set in shortly has raised the hopes of farmers.

Medicinal plant growers in distress



Poor price and not being a 'notified crop' are adversely affecting growers of kanvali kilangu (*gloriosa superba*), a medicinal plant widely grown in the district.

The crop constitutes almost 99 per cent of the total acreage under the medicinal plants in the district.

The seeds are used to produce phytochemicals. They are used in herbal medicines used to fight various ailments, including cancer. There is a huge demand for the medicine in European countries.

Now the crop is in the flowering stage.

The farmers feel that if the government do not announce a support price or extend loan facilities after declaring it as a 'notified crop', they would suffer heavy losses.

"We were getting as much as Rs. 1,750 for a kg of kilangu seeds five years back. The prices have slumped to Rs. 700 a kg. Only a handful of farmers get at least just over Rs. 1,000 a kg," said B. Lingasamy, president of Tamil Nadu *Gloriosa Superba* Growers Association.

Farmers attributed the dip in prices to growing presence of various companies in Dharapuram and Mulanur belts, which act as middlemen for exporters.

"They create a glut in the market and naturally the prices will come down as farmers do not have enough air-conditioned storage houses in the region to keep the produce till the prices go up," said Devi, another farmer.

Since the crop is not notified, the farmers could not use them to obtain loan for raising the next set of crop whenever they faced glut, said the farmers.

Raja Sankaralingam, a Tuticorin-based herbal medicine exporter and former chairman of Shellac and Forest Products Export Promotion Council, said

that there was a shrinkage in European market for the herbal extract products, which too contributed to the price slump. Horticulture department officials said that they had sent a proposal to the authorities to declare the crop as ‘notified’ to help the farmers.

Saplings planted



Alpha Matriculation Higher Secondary School, Sembakkam, celebrated Students' Day in honour of late President Dr.APJ.Abdul Kalam. Senthil Kumar, Assistant Manager of Kumaran Systems Pvt.Ltd, sponsored 84 saplings to be planted along the Sembakkam - Velachery Main Road. The first sapling was planted near Alpha Mat.Hr.Sec.School, Sembakkam, by Principal Ramani George. Students of Classes VI to IX and Class XII planted saplings from Alpha School to Gowrivakam, a stretch of 1 km.

Turmeric tales

Did you know that you can use the leaves of the plant in your cooking?



A couple of years ago, I started experimenting extensively with Asian food. Whenever Planet Food featured an episode on Asia, I ensured that I didn't miss it. One such episode introduced me to the idea of cooking with the turmeric leaf.

Though *manjal* or *haldi* — as turmeric is known in India — is used in most traditional recipes, the leaves weren't easily available in the market. Grocers asked me to wait until the harvest season. That's when it dawned on me that the only time we used the turmeric leaf was during Pongal festival, when we tie it around the mouth of the pot.

Luckily, a grand-aunt sent me a few rhizomes for me to plant. But the tiny green shoots were not as lush as I expected. So I soaked some in water until they sprouted and then planted them in moist soil, which received medium sunlight. It took about 10 days or more before there were any signs of activity. But once it started, the speed at which the plants grew was amazing. In the coastal regions of India, turmeric leaves are propagated and used to make herbal concoctions to ward off cold, fever and other respiratory allergies. In Goa, turmeric leaves are used to make a rice dish called Patholi. A paste of rice flour and water is smeared on the leaf.

Then a mixture of coconut, jaggery, cardamom and a pinch of salt is spread in the centre. The leaf is folded and placed in a steamer. The leaf's aroma intensifies as it cooks and the plant's anti-bacterial and anti-fungal properties seep into the food.

Countries like Indonesia and Thailand also use turmeric leaf parcels to steam fish and delicate seafood. The leaf needs to be soaked in water or pressed down gently in the middle to make it more pliable for folding. In Malaysian cuisine, turmeric leaves are torn lengthwise into tiny shards from the tip and added to dishes like lamb rendang, Manado chicken (ayam garo rica) and soups.

This is how I first used the turmeric leaf — I added it to a Thai chicken dish. The taste was subtle and delicious. The leaves must not be sliced with a knife. It's best torn and added towards the end of the cooking process. The distinctive smell of turmeric permeates your hand. The only thing missing is the trademark yellow colour. Many Westerners prefer to use the leaf, as they get the taste of turmeric without staining their garments while cooking. Last week, I added it to the South Indian *molagu thanni*, or *rasam*. It goes well with the spice from chillies or peppercorns.

The golden-yellow rhizome is very popular, and is sometimes referred to as 'Indian saffron'. This is largely incorrect. Due to cost factors, turmeric is substituted for saffron only for the colour. They bear no similarities either in taste or characteristic. The turmeric belongs to the ginger family and has similar medicinal properties.

My turmeric plant is now lush and green. The flowers from the plant are also included in exotic dishes. It's not difficult to grow your plants. They grow well in pots or grow bags. As I wait for the flowers to make their appearance, the leaves are being added to my cooking pot on a regular basis.

Fish farm catering to the needs of breeders

Fishes being reared at a pond at Agarapettai.— Photo: B. Velankanni raj

The Fish Farm at Agarapettai on Kallanai-Thanjavur Road has been catering to the needs of fish breeders, temple tanks and multi-purpose farm ponds.

The farm, spread over a sprawling area of one hectare, has seven nursery ponds each with a capacity of hatching one lakh hatchlings brought from the Seed Production Centre at Karanthai in Thanjavur.

“There has been a growing demand for the fishes particularly after setting up of the multi-purpose farm ponds and revival of old tanks under the Mahatma

Gandhi National Rural Employment Guarantee Scheme”, official sources told *The Hindu* on Thursday.



Four varieties of fishes – ‘catla’, ‘rohu’, ‘mrigal’ and ‘common carp’ are hatched here. While the first three varieties could be hatched between July and September, the common variety is hatched round the year. The price is Rs.252 per 1,000 fishes for the three varieties and Rs.162 for the common carp. “The farm has been handling seven lakh fishes – the target fixed for the year,” the source said.

The farm makes arrangement for safe despatch of the fishes. Fishes are bundled in oxygen-filled bags and the fishes can survive for 12 hours, to be let out into farm ponds or temple tanks.

“A large number of farmers from Nagapattinam, Tiruchi, Ariyalur and Perambalur are the largest beneficiaries of the farm. As the prices are less, the farmers prefer to purchase the breeder fishes here,” the source said. Ensuring safety and hygiene, no feed from outsiders is utilised.

The farm originally was built on earthen ponds but it had been developed into concrete ponds using NABARD funds.

A proud moment for this farmer



J. Chalapathy Rao, along with his family, whose land has been made the venue for the capital foundation ceremony.- Photo: Ch.Vijaya Bhaskar

It is always tough for a farmer to part with his land and disconnect himself from it. So it happened to J. Chalapathy Rao, a farmer from Uddandarayunipalem, when the officials told him that his land had been chosen to be the main venue of the foundation laying ceremony of the capital.

After giving so much of thought, finally Mr. Rao agreed to part with his land.

After all, the stone of the new capital of the State would be laid on his land to which his family had been attached for generations.

But, after he agreed to part with his land, not a single day had passed, when Mr. Rao did not pay a visit to his farm land. One day, he even landed up their his family members, even as a grand stage was being erected for the ceremony.

But, his children are quite excited about the ceremony.

“It is a life time opportunity and I am excited about it. I have invited all my friends to participate in the foundation ceremony,” said a jubilant Meghna, daughter of Mr. Rao, who is pursuing her final year engineering course.

Moving around and having a look at the stage works and other constructions, the family spent quite a long time at the venue on that day.

957 tonnes of paddy produced

About 957 tonnes of paddy has been procured through the 11 direct purchase centres opened in the district till Tuesday, Collector K.S. Palanisamy has said. He pointed out that the DPCs had been opened at nine places in Lalgudi taluk and two in Thuraiyur taluk. Arrangements had been made to procure paddy brought by farmers quickly.

New sweets from Aavin

Savour more sweets this Deepavali. Aavin is launching five varieties of sweets for the festive season on Thursday.

A press release said the sweets come in 250-gram packs and will be available at Aavin parlours and all franchise retail outlets in and around the city. The cashew halwa and cashew cake will be priced at Rs. 160 and Rs. 170 respectively and customers can purchase the special nut halwa for Rs. 150, choco-burfi for Rs.115 and badam halwa for Rs. 210. Customers can also place bulk orders for sweets at Aavin’s corporate office at Nandanam. They can call the 24-hour toll free helpline 18004253300 for suggestions.

Programme on plant care

Tamil Nadu Agricultural University’s Information and Training Centre will organise a training programme on care of indoor plants on October 28 between 9.30 a.m. and 4.30 p.m. at U-30, 10th Street, Anna Nagar. For details, contact 26263484.

Corporation allows Forest Department to plant saplings near lake

The Corporation has permitted the Forest Department to plant saplings near the Panamarathupatty Lake, located on the outskirts of the city.

As part of the 67th birthday celebrations of Chief Minister Jayalalitha, saplings were planted across the State.

The lake that once served as a major drinking water source for the city residents belongs to the Corporation.

The department has recently requested the Corporation to allow it to plant saplings under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS). Hence, the Corporation has decided to permit the department to plant saplings on various conditions.

The department should bear all the cost towards planting saplings and maintenance and should not install any advertising boards in the area. Also, the department should not seek rights for the trees in the future as it belongs only to the corporation.

Based on the above conditions, the Corporation allowed the department to plant saplings in the lake.

The lake, sprawling over 2,400 acres, belongs to the Corporation. However, due to encroachment of the waterways and construction of check dams across the water channels, the inflow was cut off completely.

Currently, only seemai karuvelam (*Prosopis juliflora*) trees were found in the lake.

Residents have been demanding that the trees be removed and the waterways be cleared of encroachment so that the lost glory of the lake can be restored.

The department has recently requested the Corporation to allow it to plant saplings under MGNREGS

Kitchen gardens in 500 schools

The once-common kitchen gardens might be on their way back with the Department of Horticulture initiating steps to promote them in 500 schools.

Free kits, comprising seedlings and seeds of vegetables, have been distributed to 100 schools each in Mangaluru, Puttur and Belthangady taluks. Similarly, they would be handed over to schools in Bantwal and Sullia taluks shortly, said Yogesh H R, Deputy Director, Department of Horticulture, Dakshina Kannada. Each kit has two varieties of tissue-cultured banana, Naendra and G-9, two seedlings of drumstick, two seedlings of papaya, a seedling of coconut and seeds of about 10 vegetables.

One-day training

He said the department provided one-day training on raising the kitchen garden to the head masters of the schools.

The Deputy Director said the schools could make use of vegetables grown for mid-day meal or could give it to students. The initiative was to promote interest in farming, greenery, plants among students from school days. Schools could make use of bio-waste as manure for growing vegetables.

Mr. Yogesh said schools have been chosen irrespective of whether they are government schools or government-aided private schools. The interest of the schools mattered in distributing the kits. It was because the kits should not go waste. Hence only schools which have shown interest have been considered for giving kits. Now schools would have to make use of them.



Give your green tea a festive makeover

Fasting for nine days during the Navratri festival? Don't let it wreck your diet plan, instead give the humble green tea a makeover with 'upvaas friendly' recipes.



Chef Anoop Paul shares some ‘upvaas friendly’ Lipton Green Tea recipes:

1. Sparkling Fruity Green Tea

Ingredients:

Three cups (750 mL) water
Six green tea bags
1/2 cup chilled purple grape juice
One medium orange, sliced
One medium lemon, sliced
One medium lime, sliced
1/4 cup chilled club soda

Directions:

Pour boiling water over green tea bags in teapot; cover and brew for three minutes. Remove tea bags and squeeze; stir and cool.

Combine tea with remaining ingredients except soda in large pitcher; let it chill for at least two hours. Just before serving, add soda. Pour into ice-filled glasses.

2. Green Tea Iced Tea

Ingredients:

Four cups of boiling water
Six green tea bags
One tablespoon of honey

Directions:

Pour boiling water over green tea bags in teapot; cover and brew for three minutes. Remove tea bags and squeeze; stir in honey and cool. Pour into ice-filled glasses and garnish, if desired, with lemon or orange slices.

3. Fruity Green Tea Smoothie

Ingredients:

One cup water
Four green tea with honey lemon tea bags
One ripe banana
1/2 cup ice cubes

Directions:

Pour boiling water over green tea with honey lemon tea bags; cover and brew for one to one and a half minutes. Remove tea bags and squeeze. Stir in sugar and chill. In blender, process tea, banana and ice cubes until blended.

hindustantimes

India to defend farmers' interest against developed countries at WTO



India has decided to stay firm when it comes to protecting the interest of the farmers of the country against the World Trade Organisations regulations. (HT Photo)

In a power-packed meeting chaired by Prime Minister Narendra Modi, India has decided to stay firm when it comes to protecting the interest of the farmers of the country.

According to sources, the meeting was called to review India's position at upcoming WTO's Nairobi ministerial in December. Finance minister Arun Jaitley, commerce minister Nirmala Sitharaman and senior bureaucrats, including principle secretary to the PM Nripendra Misra, commerce secretary Rita Teotia and chief economic adviser Arvind Subramanian, were among those present.

“PM Modi clearly pointed out that India should stand firm against the developed economies such as United States, which continues to oppose credible and developmental outcomes,” a source familiar with the developments said. India has been pressing hard at the WTO for a special safeguard mechanism and a permanent solution for public stockholding programmes for food security.

“PM wants India to fight the pitch of developed nations that wants to kill the DDA (Doha Development Agenda) while pursuing unresolved issues in agriculture and areas outside the DDA. If allowed this would imply that India would have to phase out the agriculture input subsidies such as fertiliser, power etc and also not to set a minimum support price. PM is

strongly opposing any such approach,” another senior official from commerce ministry said.



THE TIMES OF INDIA

Know the warning signs of Diabetes

Diabetes is often called the 'silent killer' because of its easy-to-miss signs (hence 'silent'), but ability to wreck havoc through multiple organ damage (hence a potential 'killer'). In diabetes high blood glucose acts like a poison; it is often accompanied by high blood pressure and abnormal blood lipids, forming an evil team to harm the individual.

The cells in your body rely on glucose for energy; hence glucose is essential for you to function properly. You may take some amount of glucose directly eg., in fruits; but the majority is derived from breakdown in the intestine of carbohydrates like starch present in rice, bread, potato etc. Glucose is transported to all the cells in the body through the bloodstream, which is like an elaborate road and rail network in your body.

However, in order to use the glucose, your body needs insulin. This is a hormone produced by the pancreas. Insulin is like a key that opens the 'locks' on cells to allow entry of glucose. People with type 1 diabetes no longer make insulin to help their bodies use glucose (as if their pancreas has declared a lockout), so they have to rely on regular insulin injections. People with type 2 diabetes may have enough insulin, at least initially, but they cannot use it well (as if the 'locks' on cells are defective, so the key cannot open them); they're insulin resistant. Many of the signs and symptoms of Type 1 and Type 2 diabetes are similar.

Warning Signs of Diabetes

Sometimes diabetes can develop without any warning signs. In fact, about a third of all people who have diabetes don't know they have it; most of them have Type 2 diabetes. That's why it's important to talk to your doctor about your risk for diabetes and determine if you should be tested, even if you have none of the warning signs.

Common warnings signs of diabetes include: Increased thirst or dry mouth
Frequent urination in large volumes
Increased hunger
Unexplained weight loss (even though you may be eating more)
Fatigue (weak, tired feeling)
Frequent infections (including fungal infections of the private parts) or cuts that take a long time to heal
Blurred vision

Because diabetes can lead to serious health complications, it's important to be aware of the signs of diabetes. If you have any of the above mentioned warnings signs of diabetes, give your doctor a call and schedule a diabetes test. With the right diabetes diet, regular exercise, and medications, if needed, you can manage diabetes and live an active, productive life.

Contributed by: Prof Subhankar Chowdhury, DTM&H, MD, DM, MRCP (UK)

Climate change may lead to severe water shortage in Nepal

Climate change, increase in agricultural land use and population growth may lead to severe water shortage in Nepal in the coming decades, according to a new study.

Using a sophisticated modelling tool called the Soil and Water Assessment Tool (SWAT), researchers at the Baylor University were able to account for land use, soil types, topography and meteorology to predict future climate change and project snow-melt and stream flow to assess the effects of land use on water availability in Nepal.

They found that climatic changes, increase in agricultural land use and population growth in the Himalaya Mountain basins could have negative impacts on water availability, further stressing a region plagued by natural disasters and food insecurity.

The findings indicate that the region - especially during low flow seasons — may be at severe risk for water shortages.

"This study is very important in a country like Nepal since the research is primarily focused for estimating the effects of potential climate variability and land-use changes on water flow processes of specific Himalaya Mountain systems. Water availability has become problematic due to changing climate and land management practices in this region," said the study's lead author Ram P Neupane, a postdoctoral research associate at South Dakota State University.

In a country where roughly 70 per cent of the population is dependent on agriculture, this could signal major problems for the most vulnerable in the region - those in poverty.

"The Nepalese population in this region will face many challenges over the coming decades as soil degrades and water resources continue to place enormous strains on food production and intensify recent trends of subsequent malnutrition, particularly in young children," said Sara E Alexander, associate professor of anthropology in Baylor's College of Arts & Sciences and director of the Institute of Archaeology.

"In mountain regions, continuing climate change exaggerates impacts of temperature and precipitation," said Joseph D White, professor of biology in Baylor's College of Arts & Sciences.

"This research highlights how geography plays a role in what potential impacts climate change is having on stream flow and erosion in this steep landscape," White said.

"From west to east in Nepal, roughly equivalent to the distance between Lubbock and Houston, differences in land use practices emerge as an important factor for future water conservation efforts," said White.

"How people in Nepal are using what little land is available for food and habitation is very sensitive to changing water supplied by snow water, glacier melt and monsoonal precipitation," he said.

(The study was published in the Journal of Hydrology.)

THE HINDU BusinessLine

Stock limit will hit pulses imports, trade body tells Maharashtra



The Indian Pulses and Grains Association of India expects price of pulses to come down by 10-15 per cent in next 15 days with imported pulses reaching the markets.

The association has agreed to sell tur and masur below the market price to the government for onward sale through public distribution system. It will sell 100 tonnes of tur a day at ₹135/kg against the retail price of ₹230 and a similar quantity of masur dal at ₹80.

Addressing the media, Pravin Dongre, Chairman, IPGA, said pulses prices will come down by 10-15 per cent next fortnight as shipments of 25 lakh

tonnes worth ₹6,000 crore would hit the shores of Mumbai in next three months.

The Maharashtra government should remove the stock limit of 350 tonnes on importers imposed two days back otherwise the shipments will move to West Bengal or Tamil Nadu where there is no stock limit, he said.

Incidentally, Mumbai port handles 50 per cent of total pulses imported into the country. Some of the importers have booked pulses in bulk quantity of 50,000 tonnes and this needs to be cancelled or diverted, he said. The stock limits may bring down prices in the short-term but in the long run it will unsettle the trade. Credibility of importers will be hit as they will be forced to cancel their orders leading to short supply in the market, he said.

India, which consumes nearly 22 million tonnes of pulses annually, sources yellow peas and lentils mainly from Canada and the United States, while chickpea is imported from Australia and Russia. Green gram and pigeon peas are shipped from Myanmar. The pulses crop in Canada and Australia is expected to be very good this year, however tur will be in short supply till arrivals in India starts from December-end, he said.

Imported tur prices have almost doubled to \$1,400 a tonne from \$700 a tonne a year ago due to acute shortage in global markets. About 2.5 lakh tonnes of different pulses are stuck in the outskirts of Mumbai port due to the stock limit orders. With Maharashtra cracking down on importers and traders, IPGA appealed Government to give importers, millers, wholesalers and retailers at least 60 to 90 days to liquidate current stocks and achieve the mandated stock limits.

Bimal Kothari, Vice-Chairman, IPGA, said pulses production in India, the world's largest producer, consumer and importer, was affected due to two consecutive deficient monsoons. The total production in 2014-15 was at 172 lakh tonnes against 192.5 lakh tonnes recorded in the previous year.

Surge in prices seen driving chana acreage

As prices of pulses rule high amidst short supplies, farmers are seen showing their preference to plant chana or chickpea in the ongoing rabi or winter sowing season.

The sowing of chickpea has already begun in the southern States such as Karnataka, Maharashtra, Andhra Pradesh, Telangana and Tamil Nadu and early trends suggest that acreage under this main pulses crop is set to make a significant gain this season.



Planting in Madhya Pradesh – the largest producer that accounts for about 43 per cent of the country’s total output – is yet to begin.

Karnataka acreage

In Karnataka, chickpea has been planted on about 7.8 lakh hectares (lh) till the third week of October, more than double the acreage of 3.75 lh in corresponding last year, official sources said. The State is targeting an acreage of 13.51 lh under chickpea for the current rabi season.

The recent spell of rains in the parched areas of Northern Karnataka, that witnessed deficient monsoon this year resulting in kharif crop failures, has prompted the farmers to go in for early rabi plantings.

While the rush to plant chickpea has resulted in reported shortage of seeds triggering some sporadic protests by the farmers, officials maintained that enough seeds are being made available to the growers.

Farm varsity note

Chickpea is sown during October-November and harvested from February onwards.

The Tamil Nadu Agriculture University, Coimbatore, in a recent market advisory, has advised farmers to take up sowing of the chickpea considering that the farm gate prices were likely to hover around ₹4,500-4,700/quintal during February-March. At present, chickpea is sold at ₹5,000-5,500.

The retail prices of pulses such as tur dal (arhar), urad, moong and even chickpea have skyrocketed in recent months on tight domestic supplies with poor monsoon impacting the kharif acreages triggering imports. Chana output during 2014-15 stood at 7.17 million tonnes (mt) – down from previous year's 9.53 mt.

The Agriculture ministry is targeting chana production of 9.5 mt for the 2015-16 season.

Chana stocks from the last season are entering the market and supply from stock will continue till December end.

Quoting trade sources, TNAU said that chana prices were likely to remain firm during February-March as the expected imports will land in November-December followed by local arrivals.

Slack corporate buying drags coconut oil

Festival season seems to have not cheered up either the corporate or upcountry buyers for coconut oil, as the market started falling, registering a drop of ₹400 a quintal both in Kerala and Tamil Nadu this week.

According to Thalath Mahmood, President of Cochin Oil Merchants Association (COMA), the declining trend in prices both in copra and coconut oil is still continuing, leaving corporates to stay away from the market at this lower price level.

Prices of coconut oil came down to ₹10,300 (₹10,700) in Kerala, while it was ₹9,800 (₹10,200) in Tamil Nadu. Copra prices also declined to ₹7,200 (₹7,300) in Kerala and while in Tamil Nadu, it remained at the same level of ₹7,100 quoted last week.

However, the Coconut Development Board is foreseeing a reverse trend in the price fall with the starting of festival season in North India by next month.

The Board was of the view that arrivals of coconut, copra and coconut oil are expected to be low from Kerala and Tamil Nadu with the progress of the North-East monsoon from next week.

CDB is also anticipating a decline in production in coconut in major southern States due to poor monsoon received during this year.

In Kerala, a spurt in demand for coconut is expected with the Sabarimala pilgrimage season starting by mid-November.

Spot rubber rules steady



Spot rubber prices were steady as RSS 4 continued to close unchanged at ₹114.50 a kg, according to traders and the Rubber Board. The grade was quoted steady at ₹111.50 by dealers.

November futures declined to ₹112.76 (₹113.73), December to ₹112.87 (₹113.52) and January to ₹112.75 (₹113.31) on the National Multi Commodity Exchange. RSS 3 (spot) weakened to ₹84.98 (₹85.63) at Bangkok.

October futures closed at ¥151.8 (₹82.37) in the night session on the Tokyo Commodity Exchange. Spot rubber rates (₹/kg): RSS-4: 114.50 (114.50);

RSS-5: 112(112); Ungraded: 106 (106); ISNR 20: 104 (104) and Latex (60% drc): 87 (87).

Business Standard

Sugar & cane prices should be linked: Siddharth Shriram

Even after the partial decontrol of sugar about two years ago, mills continue to be under pressure. Mills are forced to pay a high price for sugarcane to farmers and a series of measures taken by the government is not helping. Mawana Sugars promoter **Siddharth Shriram** tells *Dilip Kumar Jha* that till the Rangarajan committee formula, which proposes linking cane pricing with final product prices, is implemented, the industry's woes will persist. Edited excerpts from the interview.

Sugar mills in Uttar Pradesh are badly affected. How do you view sugarcane pricing in the state?

The Rangarajan committee formula which ensures 75 per cent of sugar revenues to farmers and 25 per cent to millers is a welcome design. However, the UP government, which has traditionally announced cane prices as state advised price (SAP), has not accepted this formula. It prefers to have a situation where it can decide cane prices, for whatever reason, without reference to sugar prices.

The Centre has taken measures to improve the situation. Will these measures help turn around the sugar industry?

The Centre is trying to increase the prices of sugar by organising exports. While the intention is good, it might not be possible within the confines of the World Trade Organization. If it is possible, will the mills be asked to make up the losses on the export price? Why should this be, especially since cane prices have been artificially determined by the state government?

Many mills, such as ours, are unable to access the central government's excise loan which was to be interest-free for a number of years or for participating in the Rs 6,000 crore loan that the government has given only

to pay farmers (this loan will have to be serviced in future years, after the first year). This leaves us in a pretty poor state. The government comes out with relief measures too little, too late.

What is the way out for companies?

Having announced a high price, the state government is reluctant to reduce these for obvious electoral purposes; it cannot reduce the price farmers will get. In this case, who will bear the burden of the difference between cane prices and sugar prices, which until a month ago was a negative 30 per cent (about Rs 6,000 a tonne)? If the government wishes to give subsidy, so be it. That is their political business. However, the industry should only be responsible for 75 per cent of sugar prices to farmers. Most of the balance sheets of sugar companies are in poor shape. Some that have more power or ethanol for sale are in a better shape. Others which run old plants, and have a higher cost of production, are in a pretty serious shape.

What is the solution?

The Rangarajan Committee formula with a proviso to make payment for sugarcane in three tranches would work. The miller would pay the first tranche of about 25 per cent within 14 days of purchase of cane to the farmer. Forty per cent would be paid about three months later when some of that sugar is sold, and the balance would be paid by the end of the sugar year.

This has the benefit of reducing interest costs for millers as we will not have to take loans from the banks who in any case are reluctant to give loans under the circumstances.

High sugar price is really a price signal for the farmers to grow more cane. A lower price will balance the economics between sugarcane and other crops and the farmers can decide which way they should go.

What about the mills? Can there be a win-win solution for both farmers and mills?

It will take at least two-three years of high sugar prices to repair the balance sheets of companies, so the government should implement the Rangarajan Committee after two years from this season. The farmer will get two years to

decide whether he wishes to grow sugarcane or any other crop. In the next two years, the central and state governments could make up for the losses that are likely to accrue. Thereafter, with the linkage of sugarcane prices and sugar prices, we will not need any further government intervention.

Rising fodder prices spell gloom for poultry sector



The rising cost of fodder ingredients in the past few days has pushed the [poultry industry](#) into doldrums. An increase of the price of soya meal, a key ingredient, by almost Rs 1,000 per quintal, has left many small players worried.

Against the cost of Rs 3 an egg, the farm gate price is between Rs 2.65 and Rs 2.70. P Tamil Arsan, vice-president of National [Egg](#) Co-ordination Committee (NECC), Namakkal, the largest poultry cluster in India producing 32 million eggs a day, said the fall in price of eggs, coupled with a revision in feed cost, might force small players to exit the business.

There has been a drastic fall in the farm gate price of broiler as well. It fell from Rs 70 a kg in August this year to Rs 55 a kg in October. [Poultry farmers](#) are waiting for revival in demand after the navratras and hoping middlemen give up some percentage of profit for the larger interest of the business.

Poultry farmers had a double blow, as prices of eggs and chicken also plunged sharply in the past few weeks. The average prices of eggs and

broiler fell by 10 per cent and 25 per cent, respectively, in October, compared to the corresponding period last year.

Traders attribute this to the gap between demand and supply. A Delhi-based trader, who did not wish to be named, said broiler prices dropped due to the increased presence of bulk suppliers. Large players reap the economies of scale and glut the market with cheaper products.

BOILING UP
Average farm gate price of eggs and broilers

Period	Average farm gate price	
	Egg (₹)	Broiler (₹/kg)
Oct 2013	3.30	70
Oct 2014	3.22	75
Oct 2015	2.70	55

Sources: NECC Namakkal and Barwala Egg Cluster (Haryana)

The big houses in this space include Venkies, Sugna Foods, CP Foods, Shalimar Breedings.

While there are concerns about [soya meal](#) made from GM seeds and its repercussions on agriculture, David Green, a bio-tech expert, and president of Greenhouse Communications, who had visited the country last week on an invitation by the Centre, gave a solution to keep soya price under check. According to him, countries with large populations have been importing GM seed crops sans any

harmful effect. It should be left to the choice of farmers to use GM seeds and the import of GM soya feed from Europe and other parts of the world has proved viable.

Egg prices also registered a downward trend this year over last year due to proliferation of small poultry farms.

Arsan, director of Pepe Farms, is aghast at the sudden shift in food ingredients, price and is mulling substituting soya meal with guar meal, cotton seed and rapeseed. This might save him Rs 1 per kg.

With the dwindling margins, banks are reluctant to lend. Subsidies offered by the governments of Uttar Pradesh, Bihar and Odisha for the poultry industry have also affected the business in Namakkal, he said.

The Barwala poultry cluster in Haryana is also in a shambles. Parmod Singla, a former president of the Haryana Poultry Farmers Association, said egg prices were low because of the cartels of traders. Prices crashed only at

farm gate levels but retail consumers are getting an egg at Rs 5 to Rs 6 an egg.

"A poultry farmer in Barwala is producing an egg at Rs 3.10 and selling at Rs 2.70. For each egg he is incurring a loss of 40 paise. Some small farms are on the verge of closure," he added.

"We sent a proposal to the Haryana government to provide us damaged wheat, rice, bajra and maize, instead of selling to bulk traders. This can help us with substantial cost saving. There has been no response. Traders buy the damaged stock from the government at half the price and book a fat margin in the open market when we buy from them," he said.

Climate change can slam global economy, says report

[Climate change](#) could cause 10 times as much damage to the [global economy](#) as previously estimated, slashing output as much as 23 per cent by the end of the century, a new research paper from Stanford and Berkeley finds.

Looking at 166 countries from 1960 to 2010, the researchers identified an optimal average annual temperature that coincides with peak productivity of, for example, labor and crops. It's 55 degrees Fahrenheit (13 degrees Celsius), or approximately the climate of San Francisco's bay area.

The paper appears in the new issue of Nature.

Countries in the tropics, already hotter than this optimal temperature, are likely to face the most dramatic economic pain from warming, the study found. Countries at or just past the 55-degree annual average, such as the US, China, and Japan, may be increasingly vulnerable to losses as the temperature warms.

Northern countries well below the ideal average may see benefits as opportunities open up for agriculture and industry. But this was the least robust finding. And even if the warming improves the lot of Scandinavia and Canada, such nations may not have many healthy trading partners left as others suffer.

Also, higher temperatures in northern countries don't take into account changes in precipitation, more extreme weather, and the many other risks in a warming world.

The authors made a clever end run around the biggest problem at the core of climate science. There's only one Earth. Scientists like to run "controls," situations that have identical conditions to the experiment except for the one thing being studied. Unfortunately for climate scientists, there's no second Earth, filled with identical people doing identical things, where greenhouse gas emissions aren't a problem.

So the study looks at national temperature records through time. Instead of studying a warming Nigeria and a control Nigeria, the scientists compared Nigerian economic output in average years with that in warming years.

"If you have a lot of data on a lot of countries in a lot of years, that allows you to start to distinguish the particular role of temperature in economic performance," said Stanford's Marshall Burke, the co-lead author.

Once they calibrated this analysis, the researchers took the second step, applying it to the mostly widely accepted climate change scenarios. They found that if the economies continue to respond to heat the way they have in the past, most of the world is in for a rough ride.

What they are not doing, Burke said, is making an argument that temperature is necessarily the most important factor driving national economies. "Climate is not fate," he said. "Countries can do a lot, and there many other factors beyond temperature that matter," such as geography, culture, and governance institutions.

Data from the study may challenge some assumptions made in computer models of climate change and economics. So-called integrated assessment models have buried within their calculations something called a "damage function," which informs how bad, or benign, various changes might turn out. The damage function suggested by the new data is five to 10 times as high as in commonly used models.

William Nordhaus of Yale is the creator of the Dynamic Integrated Model of Climate & the Economy, or DICE, probably the most commonly used of the

three major models. He has seen the new Nature paper but said he would withhold judgment until the statistical analysis of the data has been tested.

"Their findings are startling," said Trevor Houser, an energy and climate expert at the Rhodium Group, a research firm. "In their base-case estimate, the global economic price tag is more than 20 per cent of GDP, several times higher than previous estimates." (Houser worked with one of the paper's authors, Solomon Hsiang, on their recent study Economic Risks of Climate Change, independent research funded in part by Bloomberg Philanthropies.)

If the study holds up, it has the potential to influence policy in a couple of ways.

This graph projects the economic impact of climate change on the world economy through 2100. There is a 63 per cent likelihood that GDP will fall more than 10 per cent, a 51 per cent chance it will fall more than 20 per cent, and 12 per cent odds it will fall by more than half, according to a new Nature study. Burke, Hsiang, Miguel; Nature

Rational policymakers typically weigh the costs of climate policy to the economy-carbon taxes, fuel efficiency standards, subsidies-against the projected costs of doing nothing, informed assumptions in the damage function of the climate-economic models. A dramatically higher damage function changes the cost/benefit analysis and makes potential policies that looked expensive yesterday much cheaper by comparison.

Another takeaway from the study is that over the past six decades, economies haven't adapted well to hotter temperatures. "We're optimistic on adaptation and its long-run potential," Burke said. "Looking historically, we don't see a lot of evidence that we're good at that."

A cliché repeated in some scientific circles suggests that there are three possible responses to climate change: mitigation (the word works like to use instead of prevention), adaptation, and suffering. If the new study means our mitigation efforts are even weaker than previously thought, and we don't have a proven track record of adaptation, are we setting ourselves up for suffering?

"That's exactly right," Burke said. "That's exactly right."