

## Cash Incentives – The New Farm Loan waiver

*Direct cash transfers are becoming the new fad*

**A**ndhra Pradesh becomes yet another state in implementing a cash incentive scheme for the farmers. Named, YSR Rythu Bharosa-PM Kisaan, the farmers in the state will be entitled to an annual benefit of Rs 13,500. This is so far the highest financial support offered to farmers by any state in India. This is part of the Chief Minister, Jagan Mohan Reddy's Navaratnalu, a basket of nine welfare schemes, that was part of his election campaign.

The YSR Rythu Bharosa replaces the previous TDP government's 'Annadata Sukhibhava' scheme, introduced in February this year. Under Rythu Bharosa, land holder farmers owning up to five acres will be provided with an annual benefit of Rs 13,500. Landless cultivators or tenant farmers from SC, ST, BC and minority groups are also eligible for the incentive. The amount includes the annual benefit of Rs 6,000 per family provided by the Centre under the PM KISAN Yojana. While the previous government's beneficiary list included 43 lakh farmers, Rythu Bharosa is expected to cover around 51 lakh farmers, apart from nearly 3 lakh tenant farmers. The scheme also assures drilling of borewells free of cost, a calamity relief fund of Rs 4,000 crore, 9 hours of free electricity during the day, and setting up of cold storage units and food processing centres. The total budgeted outlay for YSR Rythu Bharosa in 2019-20 is Rs 8,750 crore, of which Rs 3,240 crore is coming from the Centre and the balance from the AP government.

Andhra Pradesh becomes the latest state to join the bandwagon of states reposing faith in cash incentive schemes. K Chandrashekar Rao headed Telangana government's Rythu Bandhu scheme heralded all other cash based scheme. Launched ahead of PM Kisan, the scheme extended support of Rs 4,000 per acre for each season. The Naveen Patnaik-led government in Odisha came out with the famed, Krushak Assistance for Livelihood and

Income Augmentation or KALIA scheme in 2019-20, allocating Rs 10,000-per-year payment for two crops (kharif and rabi). The Trinamool Congress government in West Bengal and the BJP-ruled governments in Jharkhand and Haryana, have also implemented the cash incentive schemes for the farmers.

Most of the governments are fast switching to direct cash transfers to woo the farmers. With economists slamming the farm loan waiver schemes, direct cash transfers seem to be the next popular option. According to the RBI report, 2018-19 marked a "watershed", with some states opting for income support schemes over "conventional" policies such as farm loan waivers to alleviate agricultural distress. While welcoming this move to cash transfers, it has, however, noted that they can succeed only with digitisation of land records and their linking with Aadhaar-seeded bank accounts "for ensuring timely payments to farmers, while minimizing inclusion and exclusion errors".

One of the key deterrants for increasing the profitability of agriculture and realizing income for farmers, is the rising cost of inputs. By directly transferring the required amount to farmers' account, to some extent this issue can be addressed. Mechanization, better inputs, irrigation are some other avenues that the farmer can expand. It will ease out the imminent agriculture distress. But will it cure the pervasive agrarian distress. The answer is a definite no.

But most importantly the immediate concern is whether this is going to shift the focus away from developmental policies in agriculture. Agriculture in years ahead would demand more investments in technology, inputs and research as the twin challenge of maintaining food security, sustainably, in changing climates becomes more and more pronounced. Hopefully, the authorities would also allocate sufficient funds to bring about holistic improvement in agriculture, infrastructure and life of farmers.

## Beckoning Nutritional Revolution

*Oct 16 is celebrated as World Food Day*

**W**orld Food Day is celebrated every year on 16th October in honour of the date of the founding of the Food and Agriculture Organization. This day every year people from around the globe tighten their resolve to tackle hunger. Celebrating the creation of the Food and Agriculture Organization (FAO), events are organized in over 150 countries across the world, making it one of the most celebrated days of the UN calendar. These events promote worldwide awareness and action for those who suffer from hunger and for the need to ensure food security and nutritious diets for all. The focus of the day is that food is a basic and fundamental human right. Yet, in a world of billions, over 820 million people worldwide suffer from chronic undernourishment; 60% women and almost five million children under the age of five die of malnutrition-related causes every day. It's also important to note that while millions go hungry, 672 million people suffer from obesity, and a further 1.3 billion are overweight. This year, World Food Day calls for action across sectors to make healthy and sustainable diets affordable and accessible to everyone. At the same time, it calls on everyone to start thinking about what we eat.

A combination of unhealthy diets and sedentary lifestyles has sent obesity rates soaring, not only in developed countries, but also in low-income countries, where hunger and obesity often coexist. Now over 670 million adults and 120 million girls and boys (5-19 years) are obese, and over 40 million children under 5 are overweight, while over 820 million people suffer from hunger. An unhealthy diet is the leading risk factor for deaths from non-communicable diseases (NCDs), including cardiovascular diseases, diabetes and certain cancers. Linked with one fifth of deaths worldwide, unhealthy eating habits are also taking a toll on national health budgets costing up to USD 2 trillion per year.

Obesity and other forms of malnutrition affect

nearly one in three people. Projections indicate that the number will be one in two by 2025. The good news is that affordable solutions exist to reduce all forms of malnutrition, but they require greater global commitment and action.

Answers can be found in the agriculture systems around the world. Our changing food habits have changed our farming systems. Our food habits have shifted from being local to being global. Our local cuisines have given away to more refined starches, sugar, fats, salt and processed foods, meat and other animal-source products. Mass production of improved varieties have usurped the resilient local varieties. Owing to lack of our interest in local cuisines, biodiversity is eroding away. Today only nine plant species account for 66% of total crop production despite the fact that throughout history, more than 6000 species have been cultivated for food. A diverse variety of crops is crucial for providing healthy diets and safeguarding the environment.

So to bring back affordable and nutritious food to the tables, our agriculture systems need to change and encourage cultivation of wholesome food. This has the potential to not only increase the nutrition in our food menu, but to support the small holders and marginal farmers. Millets and coarse cereals which are rich in many nutritional elements and fiber, can improve the quality of diet and hence health of people. Besides, these region specific crops and varieties are more resilient to climate changes and will be an important tool to fight climate change, poverty and malnutrition.

India has made glorious achievements in the food sector. Our resolve to fight hunger was strongly backed by green revolution technologies. Today our country stands tall in food production front. However, India is yet to address the challenge of nutritional security. Malnutrition is still an infliction that we have to do away with. It is time to switch to healthier and affordable food. It is time for a nutritional revolution.

## AgriMechanization – The New Norm

*Uberization can make farm mechanization accessible and affordable*

**S**mall and marginal farmers dot the agriculture landscape of India. The country which boasts of many agricultural firsts, has 126 million farmers who cultivate on lands less than two hectares, owning just 47.3% of the crop area. They together own about 74.4 million hectares of land – or an average holding of just 0.6 hectares each – not enough to produce surpluses which can financially sustain their families. The number of small holdings is also expected to increase over the years.

Economic survey 2019-20 has observed that the area operated by the marginal and small farmers increased from 38.9 per cent in 2000-01 to 47.4 per cent in 2015-16, while large holdings decreased from 37.2 per cent to 20 per cent during this period. The trend is expected to continue in the future and the farmers will be pushed into perennial poverty, if enough solutions do not reach them on time to increase their incomes. The solutions developed need to be customized or packaged according to the needs of the small farmer. Even mechanization commonly perceived as a privilege of large farms or better off farmers, need to be expanded to include the small farms.

Shortage of labour and wage hikes have increased the cost of production. Investing in mechanization becomes an impossible proposition for these farmers. However, a number of solutions are being developed to address this issue. Custom hiring centers have evolved to fill up this space. More recently many start ups have emerged with promising models. Global firms Aeris India and 'Hello Tractors' have collaborated together to provide an Uber-like rental and hiring facility for tractors in the country. Companies like Mahindra and Mahindra's Tringo, Khetibadi.com and EM3 services have been providing platforms for farmers to take tractors on lease or rent for a value.

Mechanization can help improve the general structure of Indian agriculture. Mechanization has the potential to expand the area under cultivation. By

performing operations at the right time, production potential of the land area is maximized and the number of crops on the same land can be increased. Reduction of the drudgery associated with the use of human muscle power for tasks, such as hand hoeing for primary tillage – especially important in tropical areas where high temperatures and humidity (sometimes associated with inadequate nutrition) make manual work extremely arduous. Smallholder farmers can access input supply chains and can get easily integrated into modern food systems and thus provide for more income, renewed business opportunities and further value addition. Moreover agricultural mechanization in its broadest sense can contribute significantly to the development of food systems, as it has the potential to render post-harvest, processing and marketing activities and functions more efficient, effective and environmentally friendly. Mechanization technologies enable smallholders to enhance yields through the adoption of intensification, conservation agriculture, and other climate-resilient, labour- and energy-efficient, and gender-friendly practices. Agricultural mechanization has the potential to produce social opportunities (and outcomes) for small-scale farmers. It can reduce the risk of low yields thanks to increased cropping intensity and timely planting, weed control and harvesting, and can facilitate storage, resulting in better food security and improved nutrition for the farm family.

Considering the fact that small holders dominate the farming scene in India, the advantages of farm mechanization should reach them, especially when there are a plethora of advantages they offer. To universalize mechanization among all farmers in India, uberization can play an important role. The twenty first century and the years ahead will be pinning hope on ideas that can increase the land productivity. Mechanization would become inevitable, as farm labour force dwindles in wake of other opportunities.

## Digital agriculture to double farm incomes

*Digital technologies can reduce farm risks and increase farm incomes*

**D**igital Agriculture is no more a fantasy. A reality that has started to gain traction in Indian soils, digital technologies such as Artificial Intelligence (AI), Cloud Machine Learning, Satellite Imagery and advanced analytics are empowering small-holder farmers to increase their income through higher crop yield and greater price control.

Currently a localized phenomenon, mainly in pilot projects, digital agriculture is sowing hopes and yielding positive results. In some villages in Telangana, Maharashtra and Madhya Pradesh, farmers are receiving automated voice calls that tell them whether their cotton crops are at risk of a pest attack, based on weather conditions and crop stage. In collaboration with the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), Microsoft has developed an AI-Sowing App powered by Cortana Intelligence Suite including Machine Learning and Power BI. The app sends sowing advisories to participating farmers on the optimal date to sow. Farmers don't need to install any sensors in their fields or incur any capital expenditure. All they need is a feature phone capable of receiving text messages.

Artificial Intelligence and big data are going to be a "game changer" in the agriculture sector, and the government is aiming to collate about 80 per cent of such data by 2020, according to Agriculture Secretary, Sanjay Aggarwal. The data will help in framing the right policy and converge some projects in order to achieve the targeted development of farmers and the overall sector.

United Phosphorous (UPL) in collaboration with Microsoft has created a Pest Risk Prediction API that enables farmers to get predictive insights on the possibility of pest infestation. This empowers them to plan in advance, reducing crop loss due to pests and thereby helping them to double the farm income.

Microsoft has also developed a multivariate agricultural commodity price forecasting model to predict future commodity arrival and the corresponding prices. The model uses remote sensing data from geo-stationary satellite images to predict crop yields through every stage of farming. This data along with other inputs such as historical sowing area, production, yield, weather, among other datasets, are used in an elastic-net framework to predict the timing of arrival of grains in the market as well as their quantum, which would determine their pricing.

Shifting weather patterns such as increase in temperature, changes in precipitation levels, and ground water density, can affect farmers, especially those who are dependent on timely rains for their crops. Leveraging the cloud and AI to predict advisories for sowing, pest control and commodity pricing, is a major initiative towards creating increased income and providing stability for the agricultural community.

AI can be used in multiple domains of agriculture. Indian agriculture has been mostly traditional and the farmers have relied upon their perfectly honed agriculture wisdom in raising crops and protecting them. However, the challenges have broadened. The today and the future can no longer be dictated by individual farmers' cognitive abilities. Unpredictable climates and global markets influence agriculture today. Traditional farming practices and subsistence level of farming have not been able to realise the full potential of the Indian fields. And failure of monsoon in the country has often resulted in failure of farming and suicides of farmers. But the use of cutting edge technologies like Artificial Intelligence may help Indian farmers to choose the right crop and minimise the risks and raise farm incomes to decent levels. Digital agriculture is going to be the next fastest adopted technology in agriculture.