

Prediction of Crop Yield Using Stacked Regression Based On Agricultural Data

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ABSTRACT

Agro based industry is viewed as the dawn division of the Indian economy in perspective of its vast potential for development and likely financial effect particularly on job and wage era. A few appraisals propose that in created nations, more or less 14 for every penny of the aggregate work power is occupied with agro-handling segment specifically or by implication.

On the other hand, in India, just around 3 for each penny of the work power discovers business in this area uncovering its immature state and immense undiscovered potential for vocation. There is no denying that India needs to live with the issue of unemployment for a long time to come.

Accordingly need emerges to make all over improvement among all areas of the general public particularly in country agro based modern units. The present paper is an endeavor to figure out the status of agro based units, for example, rice plant industry in the Patiala area of Punjab and to break down the Different issues being confronted by them. It has been found that Rice factory industry in Patiala area is in the emergency and confronting the different issues in regards to absence of monetary help, shameful advertising channel, high level of breakdown of completed items and non-accessibility of examination lab for quality control. On the other hand, if this part will be legitimately created, it can make state Punjab a noteworthy player at the worldwide level for promoting and supply of handled sustenance for billion or more mouths to nourish.

I. INTRODUCTION:

The number of inhabitants on the planet is relied upon to achieve eight billion by the year 2025. It likewise a truth that more than 90% of the world populace increment is happening and will keep on happening at higher rates in creating nations. Some exploration says that of the potential size of cultivable area, which is around 3 billion hectares or just 22percent of the world's landmass, not as much as half is being utilized gainfully. The test confronted by these creating nations is to sustain their expanding populaces where there is almost no expansion al cultivable area accessible. This implies that with a specific end goal to meet the future nourishment requests, these nations need to receive more serious editing works on utilizing all conceivable motorization and administration systems. For escalated editing, convenience of operations is a standout amongst the most critical variables which must be accomplished just with proper utilization of farming machines.

II. Agriculture and Food Security: Crises and Challenges Today:

India's system of agrarian improvement and way to deal with nourishment security has demonstrated its flexibility in the wake of late worldwide sustenance emergency, which has made political and social turmoil in a few nations of the creating scene. The same had before helped India hold over the serious nourishment emergency of the mid-sixties inside of a time of one and half decade and had additionally demonstrated its fitness in the wake of financial liberalization and globalization since the mid nineties. Despite the fact that India's execution as far as lessening yearning and lack of healthy sustenance has not been wonderful given the political and socio-social milieu, the accomplishments have without a doubt been noteworthy. Indian agribusiness has experienced an extraordinary change amid the previous five decades. The transformation was brought by not just innovative changes, for example, the green upset, additionally by institutional advancements in conveying homestead inputs and promoting of yield. Contract cultivating is one such institutional activity attempted as of late to address a portion of the issues confronted by Indian agriculturists. The National Agricultural Policy (2000), reported by the Government of India, looks to advance contract cultivating by including the private area to quicken innovation exchange, capital inflow and guaranteed advertising of harvest creation (Asokan, 2005).

India's Food Security Food security both at the national and family levels has been the center of rural advancement in India since the time that the mid-sixties when import reliance for oats had gone upto 16 for every penny and the nation confronted serious dry season ceaselessly for a long time. The new approach proposed at augmenting the creation of cereals and included building an establishment of sustenance security on three key components, in particular, procurement of an enhanced horticultural innovation bundle for the ranchers, conveyance of present day homestead inputs, specialized expertise and institutional credit to the rancher. For accomplishing these goals, a few approach instruments were utilized that affected the creation potential. South Asia, including Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka has high populace weight ashore and other normal assets to deliver sustenance and meet other formative needs. South Asian nations have made huge progression in sustenance generation amid the previous three decades, changing the area from a nourishment shortfall to a sustenance independent district. This could happen because of improvements in agribusiness research and compelling spread of examination yield.

These progressions have been evoked by the green unrest in South Asia, including the improvement and dissemination of high yielding mixtures (HYVs), particularly of rice and wheat, from the mid- 1960s, joined by the utilization of expanded levels of inputs, mainly watering system, composts and tractors, and strategy support. Government interest in framework, research and augmentation, cost and different approaches alongside methods for yield, domesticated animals and fisheries creation have radically served to build nourishment generation and its accessibility. Regardless of these accomplishments, creating extra sustenance with constrained land and giving monetary access to nourishment at the family level for guaranteeing nourishment security would keep on being a noteworthy test for South Asian nations. In the meantime, the sustenance utilization example has been changing with more extensive accessibility of nourishment decisions, supported monetary development and expanding urban populace. Such changes in utilization example are prone to impact the product decision, creation, profitability, costs, global exchange and environment. This thusly requires an examination of the progressions in agrarian profitability and future wellsprings of rural development bookkeeping.

III. Current Agricultural Scenario:

Agribusiness is the premise of economy and sustenance of life of the populace of India. Practical horticulture may be viewed as the effective administration of assets for agribusiness to fulfill the changing human needs while keeping up or upgrading the nature of environment and preserving common assets. Practical farming incorporates three principle objectives: ecological wellbeing, monetary productivity, and social value. Accomplishment in advancing economical farming can be accomplished on seven fronts, specifically, edit broadening, hereditary differing qualities, incorporated supplement administration, coordinated vermin administration, maintainable water administration, post-harvest innovation and sound expansion programs (FAO, 1991).

It is for the most part accepted that India has kept up a palatable level of nourishment creation in the 1980s. Sustenance grain creation in India has seen a consistent expanding development rate amid the 1970s and 1980s from the rate of the earlier decades, however the 1990s has seen a sharp fall in the development rate. Truth be told, the development rate of sustenance grain generation amid the 1990s has been near to the yearly populace development rate, which suggests a stagnant per capita creation level (Rao, 1997; Sawant, 1997). A far reaching investigation of horticultural execution and efficiency of Indian agribusiness by Kumar (2001) has uncovered that the adjustments in editing example have been occurring as a consequence of substitution of low profitability edits by those which have demonstrated great execution in profitability development. Some of these products are paddy, wheat, maize, groundnut, rapeseed and mustard and sugarcane. Coarse oat and heartbeats have demonstrated a relentless decrease in their general vicinity. Changes in the trimming example had added to yield development extensively. Future wellspring of sustenance supply would be the improvement of yield through innovative change (Kumar, 2001).

Nonetheless, maintaining a consistent development rate of yield would require productive and ideal asset utilization of area, surface and ground water, and hereditary assets, more prominent thoughtfulness regarding editing frameworks than individual harvests, patching up the exploration and augmentation frameworks towards varietal change for dry area yields, reinforcing versatile nearby research, accentuation on biodiversity and environmental offsets, enhancing provincial framework including preparing, showcasing and stockpiling, instruction and access to broad communications, and improvement of rustic money related markets (Vaidyanathan, 1994).

IV. Transformation of agriculture

The Green Revolution

The Green Revolution in Asia, which predominantly embodied an emotional increment in the generation of three vital grain crops – rice, maize and wheat – somewhere around 1965 and 1990, was driven by quick advances in the sciences and significant open interests in and strategy support for agribusiness (Hazell, 2009).

This spoke to the first significant change of the horticulture division in Asia in its present day history. Grain generation dramatically multiplied in Asia somewhere around 1970 and 1995, from 313 to 650 million tons for each year. Subsequently, per capita calorie accessibility expanded by around 30 for every penny and genuine costs of wheat and rice diminished. Higher generation of every one of the three noteworthy cereal products was acknowledged fundamentally through yield development. Somewhere around 1965 and 1982, normal rice, maize and wheat yields increased by 2.54 per cent, 3.48 per cent and 4.07 per cent per year, respectively. During the same period, cultivated area expanded by only 0.7 per cent, 1.09 per cent and 1.3 per cent, respectively. The success of the Green Revolution in raising food production and productivity, broadening economic growth and reducing poverty has been impressive. Nevertheless, in recent years 3 agricultural productions has experienced a number of challenges that have cast doubts on the sustainability of past gains.

V. Recent transformations in agriculture:

Growth in domestic consumption of high-value commodities

Rapid economic and income growth, urbanization and globalization are leading to a significant shift in diet in Asia and the Pacific region, away from staples and increasingly towards livestock and dairy products, fruits and vegetables, and fats and oils. Rapid income growth is a key factor in the rising demand for high-value agricultural products. In most Asian countries urbanization is increasing rapidly and studies have shown that urban households spend more on meat, fish and sugar and less on rice than rural households, even after taking into account income and household characteristics (Minot et al., 2003).

Trade liberalization has also contributed to the growth of high-value agriculture. The reduction in import barriers in industrialized countries has favoured the growth of high-value exports such as fish and seafood products. Likewise, foreign direct investment has also facilitated the transformation of agricultural production in developing countries. It has facilitated the expansion of food processing, animal feed production, exports and food retailing. The entry of foreign companies into the agriculture sector has put competitive pressure on domestic agribusiness companies (Gulati et al., 2005).

A recent study by the International Food Policy Research Institute (IFPRI) analysed the growth of high-value agriculture in Asia and its implications on the restructuring of the agricultural supply chain, and on the role of small farmers (Gulati et al., 2006). These countries include the largest and most important transforming countries of Asia – Bangladesh, India and Pakistan in South Asia; Indonesia, the Philippines, Thailand and Viet Nam in Southeast Asia; and China in East Asia.

The study documented a clear shift in food consumption from grains and other starchy staple crops such as cassava and sweet potatoes to meat, milk, eggs, fish, fruits and vegetables mainly due to income increases. In these countries, per capita grain consumption either increased very slowly or even decreased between 1990 and 2000. In contrast, per capita demand for vegetables, fruits, and animal products increased substantially in all countries.

Growth in exports

In addition to rising domestic demand, these high-value commodities have also experienced high export demand. High-value products such as fruits, vegetables, livestock products and fish constitute a rapidly growing share of international trade in agricultural products. In these countries as a group, the share of high-value exports in total agricultural exports increased from 47 per cent to 53 per cent.

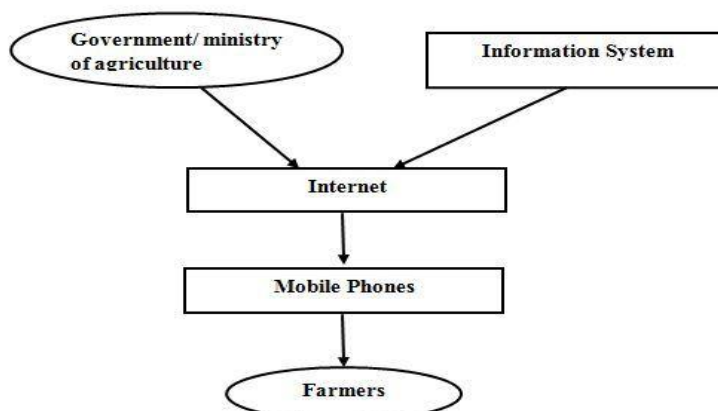
Growth in production

Due mainly to the high growth in domestic demand and, to some extent, an increase in exports, the production of high-value commodities in many Asian countries has grown more rapidly than that of food grains. The production of food grains in the eight countries under study increased by 1.3 per cent per year during the 1990s, slightly below the population growth rate of 1.5 per cent. In contrast, the production of high-value commodities grew much more rapidly during this period. For example, fruit and vegetable production increased by 7.7 per cent in these eight countries. China, in particular, achieved a very high growth rate in the production of fruits and vegetables. Between 1980 and 2004, 58 per cent of the increase in global horticulture production came from China, 38 per cent from all other developing.

VI. PROPOSED SYSTEM

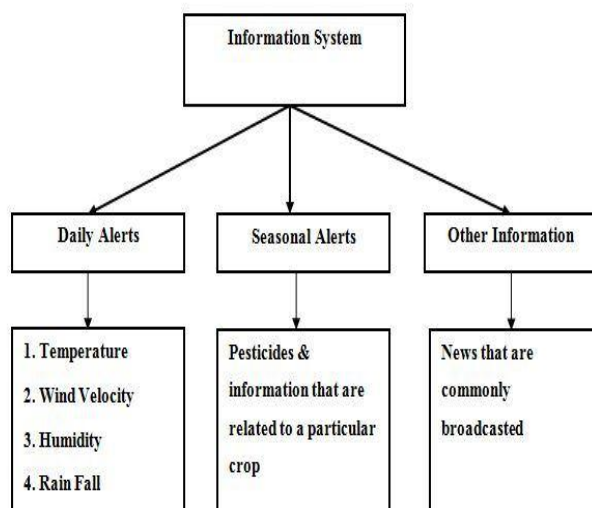
For improving agricultural productivity an expert[4][5] agricultural advice is given to the farmers both in a timely and personalized situations. Here, in this system agricultural experts generate the advice by using the modern agriculture which is highly knowledge intensive which also requires timely, reliable and accurate information on natural resource endowments and their usage patterns at present and future technology available for their utilization and other information about markets, weather, insurance, subsidy, etc.

The Architecture of the proposed system is as follows:



The news releases from the government does not reach the farmers in time, therefore an alert system is being built for daily releases and for seasonal releases.

The Information System is classified as follows:



VII. Opportunities for higher productivity, higher incomes and sustainability

Technological innovations to address environmental problems and yield growth

To address the concerns about the sustainability of Green Revolution technologies and their ability to benefit poor farmers, particularly in less favoured areas, many are advocating new technological approaches (e.g. Pender, 2008). These include low external input and sustainable agriculture approaches based on ecological principles of farming; organic agriculture based on a similar set of agro-ecological principles but without the use of artificial chemical fertilizers, pesticides or genetically modified organisms; and biotechnology. Although biotechnology and agro-ecological approaches seem to be in opposition to one another, both approaches focus on biologically based rather than chemically based technologies, and there may be potential for realizing complementarities between these approaches. In fact, it has been argued that a combination of ecological and biotechnology approaches is needed to bring about a “Doubly Green Revolution” (Conway, 1997). Others have argued that integrated agricultural and natural resource management innovations are needed that combine improved germ plasm (using both conventional methods and biotechnology) and improved and integrated management of soils, water, biodiversity and other natural resources (CGIAR, 2005).

Conservation agriculture/zero tillage

To address the declining productivity growth of the rice-wheat system in the Indo-Gangetic plain, zero tillage has been promoted by the Rice-Wheat Consortium, a partnership of the Consultative Group on International

Agricultural Research centres and national agricultural research and extension system and with the support of IFAD and other development partners.

This technology involves planting wheat immediately after rice, without tillage, so that wheat seedlings germinate using the residual soil moisture from the previous rice crop. Zero tillage has been reported to have many advantages over conventional tillage in the rice-wheat system. It saves labour, fertilizer and energy, minimizes planting delays between crops, conserves soil, reduces irrigation water needs, increases tolerance to drought, and reduces greenhouse gas emissions (Erenstein et al., 2007).

Organic agriculture

Organic agriculture is a specific type of low external input whose requirements are more restrictive – no use of chemicals or genetically modified organisms. Based on certification, price premiums of 10 to 50 per cent are common for developing country exports of organic products (IFAD, 2005). Organic farming has increased rapidly in many Asian countries in the

last few years. In 2000-02, there were about 60,000 farms producing certified organic products on about 600,000 hectares. This increased to more than 90,000 farms on more than 3.8 million hectares in 2005-06 (Pender, 2008). China, India and Indonesia are the major organic producers in Asia.

Several studies have shown favourable impacts of organic agriculture on the costs of production and yields in Asia (IFAD, 2005; Reunglerpanyakul, 2001). However, there are several constraints to the adoption of organic farming. Profit margins usually diminish due to increased competition, and organic producers may face greater market risks as the sector grows. Perhaps the most important concern among smallholder farmers relates to the costs of certification and assuring compliance with organic standards. These problems can be addressed by developing farmer organizations at the local level and through efforts by outside agencies to develop local capacities and facilitate linkages to markets.

VIII. Main Challenges facing BIHAR Agriculture

The primary goal in Bihar agriculture must be to contribute to poverty alleviation by raising domestic incomes and net returns to rural households through broad-based equitable economic growth.

This can be accomplished through:

- increased aggregate output of crops, livestock, fishery and forestry commodities and products, wildlife and eco-tourism in a context of sustainable resource use systems;
- increased capture of value-added shares from these commodities and products through backward linkages to input supply and forward linkages in agro-industrial conditioning and processing for domestic, regional, and extra-continental markets;
- strengthening trade relationships in the context of open and competitive global markets;
- taking deliberate action to enhance women's productivity and access to income;

Substantial progress toward poverty alleviation cannot be made simply through equitable distribution of income derived from a static agricultural sector,

i.e., in a "zero-sum" situation where the gains for one group result from reductions in the economic welfare of others. Hence, the main challenges for the future, therefore, are that:

- Economic contributions from rural enterprises at all levels must be increased and equitably shared;
- Food security must be addressed as an income problem – where income is defined broadly to include income in cash and in kind from own production and/or transfers -- commensurate with population growth and the spatial distributions of need;
- Continuous flows of technological innovation must provide the base for increased productivity and income generation;
- Resource use systems must be sustainable and participatory; and
- Poverty in specific disadvantaged populations must be reduced through targeted approaches and social safety net programs, especially for women and children.

IX. CONCLUDING

Literacy and access to basic education are prerequisites for taking advantage of opportunities for higher agricultural education. Any efforts to improve men's access to higher agricultural education must, therefore, be linked to overall efforts to improve men's literacy and access to basic education.

Based on the results obtained from the above, the following conclusions were made:

- Majority of farmers in the state or country are not aware that mobile phones can be used to conduct businesses and receive information. Mobile phone costs should be lowered to enable majority of farmers for having access to the current information about agribusiness within the state or country.

- e-Agriculture has not been implemented because farmers in the country have not been sensitized about it & young farmers were in lack of information about the agriculture such that e-agriculture might provide them useful information's regarding the plantations that they have grown.
- The government should also conduct sensitization to create awareness for the farmers on how best they can use information technologies to conduct agribusiness.
- Illiteracy among farmers in reading message is also another factor that pertains the usage of technology in agriculture, to overcome this it is necessary to create awareness of learning the state language such that the message sent will be in the state language.

Participation is quantitative and can be measured by looking at literacy and enrolment provided to men. Process involves the nature and content of education given to men has both quantitative and qualitative aspects to it. The benefits of education can also be examined from both a quantitative and qualitative point of view. It is possible to have equality of participation in education without having equality of treatment during the process of education. It is also possible to have equality of treatment without being able to benefit equally from education. Greater equality in one area, however, does have a positive influence on equality in another. And, of course, equality of participation is a necessary step towards equal treatment or benefits. Recommendations include suggestions for helping farmers work together, capitalizing on new agricultural trends for diversification and niche marketing, and acknowledging the importance of local agriculture on a community-wide basis.

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