Surl FOR RESP. A.C.	Research Paper	Economics
Prinemational	Lack of Information Technology (It-Factor) A Major Hurdle in the Growth and Economy of Agriculture in India: With Special Reference to Production of Apple in Jammu &	
	Kashmir.	
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ABSTRACT from valley in Asia will be the core of atter of a "trade off" between IT Edi introduction of Bemate Sension	ntent behind to develop this paper is to motivate and digitalize the minds of the influx of the shackles of "Traditional Farming" so they may move up to the ladder. Apple being represents 98% of the total fruit production. Sopore Fruit Mandi which ranks second ntion. The effect of educational access on the percentage of apple growers is large, a fi ucation/ Application of modern techniques in apple production & Traditional farming an accessing the conditions of Apple trees	f the growers to free them g a dominant crop of the I largest fresh fruit mandi inding perhaps indicative g. Eventually showing the

KEYWORDS : Digitalized Mandis, IT System, Innovations, Quality Research, Remote Sensing, Apple Project.

Introduction:

India being a flourishing world-class economy with majority of its population associated with Primary sector. Agriculture is the backbone of Indian Economy. Importance of Agriculture in India can be visualized by the percentage of its population being associated with it and its 28 allied branches. Both forward and backward linkages which are associated with agriculture augur the economy. To make "Make in India" possible, Agriculture is to be used as a ladder. The myth of "Growth Miracle" in Singapore, Taiwan, South Korea and Japan was busted by the fact that the transfer of raw material from agriculture to Industry was a major contributor in achieving the goal within 25 odd years which advanced countries achieved in a span of 100 long years. Need of the hour is to **Digitalize Agriculture** in India at the earnest.

Asymmetric Information, a hurdle to Optimality and Welfare



India cannot forget the calamity of 2009 when, despite the excess agricultural produce, she faced starvation. This calamity can be attributed to the lack of **IT** without any hesitation. Sub-optimal distribution of agricultural produce can be corrected by the heavy investments in IT. The overall price fluctuations are monitored well when the nation is supported by well equipped IT system. The determination of price and output (when Demand and Supply are in Equilibrium) is the situation when the prices are fairly dictated by the market forces. The direction and magnitude of market forces are monitored transparently by the IT sector.

Creation of **Digitalized Mandis** is to be considered in the central and state plans. Farmers easily get victimized at mass level by parasitic traders that purchase their crops at very low rates. The lack of timely information to the farmers victimizes them even more. Keeping in view the psychology of Indians (who pay heed to rumors), it is only through IT system that rumors may be replaced by Perfect Information and hence providing a conducive and feasible environment for **well-behaved market systems**. Growth without IT is a Mirage

Weak signaling prevailed in the traditional societies where the myth of "Market clearing" increpted. The notion **Supply creates its own Demand** was 'the talk of the town'. It was the lack of **IT** during **Great Depression** which added fuel to the fire. Without solid signaling there is a probability of:-

- (1) Excess Demand (Inflation).
- (2) Excess Supply (Deflation).

IT can be used as a tool to balance these two lopsided situations.

Making the IT variable Endogenous_

Most of the economic models neglected the IT variable by keeping it constant. In some traditional and backward societies **IT** is considered a capital deepening sector (**∂K/L**) (where only IT intensive goods and services seem to flourish) resulting in an increased unemployment. But the story is different when Capital widening (K and L are used in equal proportion) approach is used. The biggest responsibility of the Government is to keep **K/L** constant by making **labor competitive** and **skilled** to compete **IT**. Opening up more and more Technical Colleges and Universities is not the sole goal but to equip them with sophisticated equipments is the fundamental goal. **R&D** efforts to improve the manufacturing industry are a much-wanted potential in order to upgrade the existing equipments (Embodied Technical Progress) or to replace them (Disembodied Technical Progress). It is the meed of the hour to arrest the **IT variable** and make it within the model. **Patenting IT techniques** will encourage competition.

The Number of Thesis generated not even equals the Number of Universities in India. It is only a fancytalk to talk of path breaking Inventions and Innovations.

Inventions are taking place throughout the Advanced Nations. An Invention becomes innovation when it is economically feasible. For IT sector in India and rest of the world the difference lies here in this equation:

 $\Delta A = \dot{B} A^{a} L^{\mu}_{B}$

ΔA: **Change in IT.** B : Rate of Change. u : 0<=u<=1

LB : Number of the Persons involved in the Creation of IT Technique.

There are two possibilities of duplication:

1: By chance.

2: By deliberation.

Example:

If $L_{_B}$ = 50, μ = 1

Means all the 50 has created new IT technique and there is no duplication.

Advanced countries fall into this category.

If $L_{B} = 50, \mu = 0$

Means all the 50 has created only one IT technique and there is duplication.

Countries like India fall into this category.

The dilemma Indian research is facing

In India there are more than 500 universities and thousands of institutions working in different fields of Agriculture but the IT awareness of the people associated with agriculture seems a minor issue to these institutions. Government institutions provide training in many IT related courses in general but no emphasis is given to the agricultural and farming community in particular .The slogan of Jai Jawan Jai Kisan by Lal Bahadur Shastri is worth mentioning in this context. Much like a soldier, our Farmer must be well armed with the latest agricultural tools and IT knowledge. Not only the Government but NGO's too need to play a major role in this sector. There are many universities and institutions in J&K but neither of them has so far initiated any IT awareness program nor has it developed any website or an android app for the agricultural and farming community so that they would get prompt assistance from time to time by having an easy access to the much needed information. The recent call for Make in India will be a turning point for better Indian economy but emphasis on IT awareness among agricultural communities is still missing at large.

A Marginal Step by Sher-i-Kashmir University of Agriculture Science & Technology (SKAUST-J) :

Scientific Advisory Committee conducted a meeting on 18-03-2014. The meeting revealed the major achievements of SKAUST. The panel revealed the technology used which stretched from the introduction of Common insect/Pests and Alternaria Blight to the Training of the farmers in plant protection.

Training program conducted is as follows:-

S.NO	Name Of The Training Program	Thematic Areas
1	Role Of Communication For Enhancing Agricultural Production.	Agriculture Extension
2	Remote Sensing Practices in Natural Resource Management	Agro Forestry
3	Integrated Disease Management	Plant Protection(Pathology)

The experts showed the fear of decline in the quality of apple production in the years to come due to change in climatic conditions. Devastating floods of 2014 is just an alarm. According to Dr Pratab (VC of SKAUST), "We may also see the quality of the apple degrading. We have already witnessed great changes in apples including a marked decline in its quality last year, he added. A time will come when the apples from Leh would be costlier than those produced in Kashmir. He added that the trend is already being witnessed I Himachal Pradesh".

So, need of the hour is to educate the growers and stop the degradation of Apple Quality. The access to observe the condition of leaves which is a fore condition for the quality of Apples. This is to be made possible through the modern technology of Remote Sensing.

Use of Remote Sensing is well-nigh limited to Agro Forestry in the Valley: Use of Remote Sensing is being limitedly extended to access the condition of Apples. Remote sensing can be extended to Apple orchards in the following way.

When the farmers or growers observe the conditions of their Apple orchards without touching them physically is a form of Remote Sensing. **Observing the color of leaves and overall appearance of Apple tree**. Remotely sensed images taken from satellites and aircrafts provide a way to reach and access plant conditions. Most Remote Sensors see the almost similar visible wavelengths of light that are seen by a human eye. Although in numerous cases Remote Sensors can also detect energy from wavelengths that are not detectable to the normal human eye. Its ability to store, analyze and display the sensed data on field maps which makes Remote Sensing a potentially important tool for Apple production as well.

Remotely sensed images are used to identify *nutrient deficiencies*, water deficiency or surplus, diseases, hail damage, wind damage, herbicide damage, and apple tree population. For variable rate of fertilizers and pesticides Remote Sensing can be used.

Apple Project:

Consolidating an aim to further technological need and guidance to the Apple Growers and boost implementation of its Apple Project throughout the valley, J&K Bank entered into a tie-up with SKAUST, Shalimar. According to the agreement, SKAUST will provide a tool to the bank in implementing its Apple Project through provision of modern technology program support to the growers for improving the quality of Apples, improving tree density and latest techniques and practices for developing production of Apple crop in the valley of Kashmir. But it seems this Apple Project is not working.

Study of 90 cases in Kashmir associated with the production of Internationally acknowledged and Economically important crops like Apple.

While having a one to one interaction with all the 90 farmers/growers including 71 apple growers and 19 saffron producers in an eight months survey conducted at different places in Kashmir, many factors were responsible for the depression, anxiety and poor income gained from the production of cashcrops like apple and saffron. While analyzing all the responsible factors, a few were seen prevailing commonly among the farming communities like *bad weather, bad road connectivity, poor support from the government, loans and the lack of timely information of market prices and fluctuation in the demand and price.*

Weather change has nothing to do with humans. It is but a natural phenomenon. With the help of IT, a farmer can have possible weather updates for 'tomorrow' given by the meteorological department so that he can manage his work accordingly. Information of Market price and demand etc. for a particular time period could prove boon to the grower. Mentally and physically a farmer is always busy with his laborious and backbreaking work in the fields and may hardly listen to the call of IT awareness programs. He may not feel comfortable with it at the first hand as he believes in his traditional way of farming. But this issue needs to be addressed and IT is to be implemented as an integral part of agriculture. The ultimate aim of a farmer isn't only to produce good crops but also to gain a good income from it. With the help of IT tools a farmer can have the hawk's eye on Market price and demand so as to gain better income besides having an eye on the possible weather updates so that he could schedule his farming and sprays accordingly. The use of IT tools like a computer or a mobile phone application may seem difficult to an agriculturist but once taught how to go through it, he will harness it successfully.

The following table illustrates the long chain of sufferings. In order to avoid a big proportion of commission agents we have to devise a well behaved IT system where rotten growers may have direct access to the consumers.

	APPLE QUALITY	
PRICE AND COST PER BOX (IN	American	Delicious

Average Market Price/Box (In	450	550
Fright/Box	50	50
Stage Wise Cost of Spray/Box (In	35	40
Commission By Commission Agents/ Box (In %)	12	12
Cost Of Durable Wooden Box (In	60	60
Grading Cost/Box (In	9	10

Source: Primary Source Data



Apples. Mittal Publications

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