

## EFFECTS OF TECHNICAL INNOVATION ON RURAL EMPLOYMENT IN AGRICULTURE SECTOR IN DISTRICT VEHARI-PAKISTAN

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### ABSTRACT

*This study employed a holistic approach to evaluate the impacts of technological change in agriculture, specifically, on productivity, employment, gender equity, income, poverty level, regional development and aggregate crop production. Economic theories are used as the basic tools of analysis and hypotheses are empirically tested using quantitative as well as qualitative techniques. At the local level, although modern agricultural technology significantly increased employment, input demand, prices and crop incomes, the gain from employment remained skewed in favor of men and income in favor of large and medium farmers. Also, significantly lower nominal wage is paid to female labor but real wage rate is significant in tunnel farming, if hired, indicating further discrimination against women. Land and other resource owners are the highest beneficiaries of technological change. Production of modern varieties alone contributes 35% to total income inequality, thereby, indicating adverse effect of modern technology on income distribution. We found that the situation is not the same in tunnel farming. Real Wage rate is very high in this type of farming. The farmers of tunnel provide some other facilities like transport, vegetables, fruit and advance payment to workers. Employment rate is almost 10 to 15 times higher in this type of farming. Furthermore, unemployment is very low during tunnel season especially unemployment rate of female labor force is almost zero in tunnel farming areas. This type of agriculture benefits both to the farmer and worker as well.*

**Key words:** Tunnel farming, alleviation of poverty, technological advancement, female workers.

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## I. INTRODUCTION

More than 66% of Pakistanis live in country zones, of which around 68 percent are utilized in agriculture (40 percent of aggregate work power). The farming segment represents around 22 percent of the national GDP and has delighted in enduring development for right around three decades, considerably adding to destitution diminishment amid the 1970s and 80s. In any case, late pattern of agriculture employments is far less reassuring and provincial destitution was back to 38.9 percent by 2002, the same level where it was toward the start of the 1990s. This has happened in spite of for the

most part good policies on price and markets, and a generally changed environment. While sequential dry seasons have unquestionably assumed an unfavorable part in the execution of the division, it likewise confronts critical basic imperatives that ruin the segment's commitment to economic development and neediness diminishment.

The creation of these high esteem off-season vegetables in Pakistan is another technology. Path in 2003, it was started in Pakistan through a private division wander in Mamon Kanjan, Faisalabad. The idea was very much created and got notoriety everywhere throughout the nation. The same model has gotten to be key enthusiasm for cultivators of KPK, Gilgit and different areas, who need to enhance their homestead profitability and wage too. The farmers who had changed from customary yields like wheat, sugar cane and cotton, to these new variety of vegetables through constrained development (barrow technology) have brought much higher benefits. Through this technology the inside temperature is raised inside the secured structure to develop diverse vegetables. Along these lines, off-season vegetables are made accessible in the business sector 30-45 days prior of their genuine season. There is an immense interest for crisp vegetables in the neighborhood and also worldwide markets, which incorporates Europe, Middle East, and Far Eastern markets. The office of developing off-season vegetables likewise takes into account developing non-customary assortments of vegetables, which are currently requested in the local business sector also when open field vegetables are not accessible in the market.

### **1.1 Tunnel Farming in Pakistan**

Farmers of the nation are progressively adopting best in tunnel technology that offers five times more productivity and profitability against conventional strategies for cultivating, enhances employment of rural population and also guarantees food security, agriculture specialists say.(quote reference).

Tunnel farming has been around in South Africa for right around 4 decades. It originates from the first thought in the nineteenth century that crops could be grown utilizing hydroponics instead of developing in the soil. In the 70's it was found that vegetables could be effectively grown without soil by utilizing nutrient based solutions. Moreover, extraordinary achievement was accomplished by covering the plants with a plastic-clad semi-round structure, dubbed a "tunnel". Tunnel may likewise be called hoops houses, high poly tunnels, high tunnels or poly tunnels. Tunnels are once in a while mistaken for Green houses. The key distinction is that tunnels are not heated and give less climate control and are less

costly. In South Africa, heating is not as basic as different climate control, such as, in European nations. This quickly gives Tunnel farming in South Africa an upper hand over establishment costs.

There are numerous points of advantages to utilizing this hydroponic technique for growing plants. The plants are developed in plastic tunnels in a development medium other than common soil. The plants get a steady stream of supplements as they are dissolved in the irrigated water framework subsequently making large and top quality food crops.

Plants are grown in dark plastic packs which helps with disposing of soil borne diseases. The packs can be filled with different sorts of mediums, however the most financially savvy strategy is untreated pine sawdust blended with shavings.

At the point when seedlings reach around 10cm they are planted in the packs. Most vegetables/fruit product, for example, tomatoes cucumbers and green peppers are prepared to ascend a string which is appended to the plant sack and overhead wires. The string is consistently twisted around the principle stem of the plant. To make the ideal growing limit.

“In Pakistan, absence of cold stockpiles, high cost of production and old agriculture framework has cut overall revenues of the farmers throughout the years. Presently, with the assistance of tunnel cultivating, they are getting nice looking returns by growing off-season crops in a controlled environment,” a specialist told The Express Tribune.

In tunnel farming, producers can have more manors per section of land by utilizing hybrid seeds, pesticides, balanced fertilizers and irrigation and watering system. Accordingly, plants get a smooth flow of supplements and produce a high quality product.

This new cultivating strategy has diminished the requirement for Indian vegetables as it gives off-season vegetables to the buyers, which were previously imported from India.

“Cucumber, cauliflower, strawberry, cabbage, melon and watermelon are the significant foods grown from the ground created through tunnel cultivating to take into account the demand amid each of the four seasons,” said Asif Ali Warraich, a tunnel agriculturist.

Tunnel technology had made room for conveying radical changes to the agricultural area, empowering the producers to plant off-season crops and enhance their financial condition, he included. “With conventional techniques, we had not possessed the capacity to try and meet the production cost,” Mr. Warraich claimed. He further said that there are three sorts of tunnel cultivating – low tunnels, walk-

in tunnels and high tunnels – were going ahead in Pakistan, including the tunnel introduced the tunnel infrastructure as per their economic related limit.

Low tunnels are less costly contrasted with high tunnels and cost Rs30,000 per acre of land. Preparation, showering and picking is troublesome in this kind of tunnel. For the most part, small agriculturists prefer low tunnel farming.

Walk-in tunnels give a more productivity contrasted with low tunnels, however walk-in tunnels have a higher infrastructure expense of Rs120,000 per acre of land.

High tunnel give greatest production and make soil arrangement, showering and picking less demanding on account of their width and stature. They cost Rs 600,000 for each acre of land for installing the infrastructure. For the most part, big farmers invest into such tunnels.

Agriculturists say they are content with the production of off-season vegetables and the great degree of profitability. They have set up the tunnels without looking for financial backing from the Government. Agri-sector is the pillar of Pakistan's economy that contributes 21% to the total national output. On the off chance that the government offers incentives to the farmers, the productivity of horticulture segment could be much higher.

Becoming out-of-season harvests in controlled air inside polythene tunnel is called Tunnel Farming. It was initially presented by William Fredrick 2600 years before. High tunnels, otherwise called loop houses, are generally basic polyethylene-shrouded unheated structures. It secured with maybe a couple sheets of plastic and two layer offering better protection and thus more cold protection. It gives greatest yield of harvests and makes simple soil readiness, picking and showering because of its width and stature. It's much appropriate for tomatoes, cucumber and sweet pepper.

Vegetable Production under high tunnel is considered for business in this anticipate pre- feasibility. This business is proposed to be found fundamentally in all mild and sub-tropical zones of the nation. All parts of tunnel cultivating i.e. choice of appropriate harvest for tunnel cultivating, nursery raising for off season trim, their nutritious prerequisite, all yield administration rehearses and diverse essential measures for profitability change has been learned at Vegetable Crops Research Program, Horticultural Research Institute (HRI), National Agricultural Research Center (NARC), Islamabad. After successful experimentation, this technology is announced technically feasible for business vegetable cultivating. The technology of tunnel cultivating is in the period of expansion to the farmers. Farmers are already using this technology at their cultivating land. The tunnel cultivating can be

effectively conveyed in Punjab, Khyber Pakhtunkhwa and some areas of Baluchistan. The task can be begun at a territory of one section of land with eight tunnels of 30ft x 100 ft (3000 sq.ft) each per section of land. Estimation of total cost is Rs.1.542 million, with fixed cost of Rs.0.685 million and working capital adding up to Rs.0.857 million.

## 1.2 Use of transport in tunnel farming

There is an extensive use of transport in tunnel farming. Many types of transport is used in tunnel farms such as :- Rickshaw Trolley, Tractor Trolley, Mini trucks , Trucks. Rickshaw Trolley and Mini truck are used for transportation of labor force and transportation of inputs, transporting output from field to market. It's found that the Rickshaw Trolley, Trucks and mini trucks are hired for more than three months in tunnel farms no other rural industry has such an intensive use of transport like tunnel farming.

## 1.3 Why we need tunnel farming?

- To present intensive cultivation per acre region.
- To get high output per acre.
- To get output according to market demand.
- To minimize the natural Hazards.
- To expand the life range and production capacity of the plants.
- To elevate vertical production to upgrade quality and amount of the produce and to decrease the area availability issues.
- To get 3-5 times more output as compare to open field.
- To bring higher price of produce as a result of its initial accessibility in the business sector.
- To spare the input assets like water, fertilizer and Time and space.
- To deal with the products in controlled and similarly simple conditions.
- To grow the crops in shorter time periods/growing seasons.

## 1.4 Distinction of This Study

Several studies have been made on tunnel farming. But most of studies have been made by Biologist and horticulturalist. They research about the methods of tunnel forming, techniques of this type of farming, increase in the productivity, and benefits to the farmer and landlords. But no study has been made on the economic effects of tunnel farming, its impacts on the economy, and its impacts on the

rural employment. So much work has been done on use modern techniques in agriculture sector by the economists but there is no specific study on tunnel farming and its economic effects on the economy. But, in this study, we want to measure the impact of tunnel farming on rural employment and gender employment in the agricultural sector of Pakistan:

### **1.5 Objective of the Study**

Tunnel farming is a highly labor-intensive technique. This type of farming has a great impact on the employment of rural sector of Pakistan. This type of farming is working for redistribution of wealth in rural areas by generating employment opportunities for raw labor as well as for skilled labor force. But our research has focused on measure the effects of Tunnel farming on the rural employment in District Vehari. By This research it is tries to find out the factors and determinants of labor and their impacts on rural workforce.

### **1.6 Scope of the Study:**

All the other studies on tunnel farming have been made by the agrarians and thy study biological aspects and impacts. No economist has work on economic impacts of tunnel farming.

All the studies made by the economists on modern agriculture farming are based on modern technology and modern techniques of farming. No economist has been studied tunnel farming and its economic effects on farmers and rural population.

It is the first study in which we have tried to measure economic effects of tunnel farming. The variables selected in the study are different from previous studies.

## **2. LITERATURE REVIEW**

Significant advances have been made to examine the Technological change and related effects. In this section, specific experimental studies are reviewed which demonstrate the different ways the effects of technological change are examine and applicable policies and suggestions drawn from them. The section showed the differentiating conclusions that one arrives taking into account one's individual circumstances. Further, this section also highlighted the lack information in zones of with respect to the comprehension of multifaceted effects of Technological change in horticulture on different circles of the economy, which formed the foundation of the present study.

Alauddin and Tisdell (1991) [1] applying the H-H model on Bangladesh rice economy recommended that the increases of purchasers were higher after the presentation of cutting edge assortments. Ahmed and Sampath (1992) [2] utilizing an enhanced variant of the H-H model recommended that, with the

watering system instigated Technological change (ITC), the yearly development rate of rice generation would surpass the populace development bringing about an expansion in per capita rice utilization. Rice creation substantially affects GDP development through its critical linkage impacts in the economy. Their examination anticipated a 16 percent expansion in normal per capita wage from 1987 level to 1995 and reasoned that ITC would altogether diminish neediness on one hand and advance distributive equity on the other. In this manner, they suggested that ITC ought to be the fundamental rice creation system requiring huge ventures from government, benefactor offices and the private area. Jayasuriya and Shand (1986) [3] says that as a rule, Technological change is gone for expanding land and work efficiency, and accordingly has significant ramifications for work retention and/or business in horticulture.

Evenson (1986) [4] and Easter et al., (1977) [5] noticed that interests in provincial bases are intended to change the conduct of farmers and recognizable proof of their commitment are imperative in giving bits of knowledge to the bearing of farming improvement endeavors.

Alauddin and Tisdell (1991) [6] reasoned that food grain creation recorded a higher development rate amid the post-Green Revolution period, especially, because of progress in editing force (inferable from the presentation of MVrice), and help in profitability of MV wheat.

The fundamental elements of agribusiness area in Pakistan are unequal appropriation of landholdings, camouflaged unemployment, conventional techniques for generation and coming about low efficiency. Land is the principle resource of farming segment yet its appropriation is exceptionally skewed in Pakistan. Anwar et al., (2004) [7] It was found that in rustic regions of Pakistan, 67 percent family units were landless and only 0.1 percent families had 1 hectare or more landholdings There existed a positive relationship amongst landholdings and salary of the families (Malik, 1996; Chaudhry, 2003). [7]

Non-farm income referred to income that is not derived from agriculture sector. Non-farm activities are getting prevalence in rural Pakistan because of reduction in capacity of agriculture sector to absorb growing population. Non-farm sector absorbs the growing rural labor force. It does not depend on land distribution like farm source of income. De Janvry et al. (2005) [8] found that land was negatively related with non-farm income and positively with farm income. Arif et al. (2000) [9] divided rural non-farm sector in four subsectors: construction; services; manufacturing and commerce. The greater tendency was observed towards services employment as compared to commodity production in rural

Pakistan. Educated individuals were more likely to adopt non-farm occupation as compared to illiterates.

Arif et al. (2000) [11] isolated country non-cultivate segment in four subsectors: development; administrations; assembling and business. The more noteworthy inclination was watched towards administrations work when contrasted with ware generation in country Pakistan. Instructed people will probably receive non-cultivate occupation when contrasted with unskilled people

Asep, Suryahadi (2006) [12] says country rural area development decidedly influences rustic non-farming division development; this implies the net impact of urban development on provincial non-rural development relies on upon the equalization of these two restricting impacts. Agarwal's outcomes likewise give backing to the theory that social standards, intermediaries by the rate of ladies working in off-farm wage exercises in the group, impact the prosperity of youngsters by expanding the likelihood of ladies' investment in off-homestead exercises. These two results affirm the significance of vertical transmission of dealing force from guardians to little girls and the flat transmission of social standards from other ladies in the group to moms.

It can be reasoned that the discoveries from the audit are demonstrative of the strengths at work during the time spent agrarian advancement in creating nations taking after the far reaching dispersion of present day farming technology, the 'Green Revolution', and the subsequent outcomes emerging thereof. Additionally, the commonly fortifying impact of base and Technological change in expanding efficiency development and in expanding wage and work opportunities has been a noteworthy main thrust in financial improvement. The blazing inquiry remains that how far would we be able to maintain the sustenance generation by undertaking the course of Technological change alone and what are the financial and ecological outcomes of this interest for food creation supportability. An inquiry the present study endeavors to answer or if nothing else give a reflection to some degree.

### **3. RESEARCH METHODOLOGY**

The primary goal of this research is to evaluate the economic impacts on rural employment of technological change in Pakistan agriculture. The research is geared towards formulating policy guidelines and strategies for effective agricultural and rural-regional development planning by explicitly taking into account the scope and limitations posed by regional characteristics of the country. Given the objectives and specific hypotheses, analyses were set out to test the hypotheses through testing of models and/or theories by application of quantitative and qualitative techniques relevant to

objectives of the study. The following sections provide details of the research design and methodologies of the study.

### **3.1 Data Source**

The exploration depends on primary data and in addition optional information and broad writing audit. As the greater part of the total information for this study is not promptly accessible in the structure required, broad field works, for accumulation, coordination and screening of information from optional sources were finished. For primary data gathering, field perception, participatory country examination (PRA) procedure, and organized poll review was directed. A nitty gritty coordination blueprint is readied which is intended to distinguish wellsprings of information from the organized poll against every parameters of the study.

### **3.2. Primary Data Source**

Primary data for this study is required to investigate the flow of technological development at the homestead level and its related multifaceted effects. Primary data, in this manner, was produced from a broad farm-survey at one particular agro-environmental locales of District Vehari (Pakistan). So as to choose the areas for farm-level survey, a noteworthy activity at the region level was executed as sketched out in the accompanying segment.

### **3.3 Location of the Study Areas**

Area of the study: total 21 union councils have been selected for analysis and collecting for data. Name of the union councils are as under:

Mailsi West, Mailsi East, Ali Wah, Shah Sattar, Alam Pur, Fadda, Burrana Khas, Karam Pur, Muhammad Shah, Wairsi Wahin, Fateh Pur, Jallah Jeem, Kikri Khurd, Buland Pur, Jahan Pur, Sargana, Sandhal, Chak No. 151/WB, Chak No. 100/WB, Mitroo, Shatab Garh.

### **3.4 Questionnaire Design**

A set of structured questionnaire is administered to collect Information on following broad categories: Detailed statistics on farmer characteristics, access of study areas to transport, communication, markets, other services, supply points of modern inputs, storage, education and health service centers; Costs of farm production activities covering all tunnel seasons: Aus – the summer season, autumn, - the winter season.

### **3.5 Analytical Technique**

In deciding the effect of cutting edge farming technology on employment, work market, and different variable markets multivariate investigations is used by proposing important relapse models, for example, Ordinary Least Squares (OLS) relapse techniques are connected as required.

#### 4. ECONOMETRIC ANALYSIS

To expressed the generation of employment equation to estimate the factors that impact the generation of employment in tunnel forming of the economy of Pakistan we analyzed the Ordinary Least square method and to analyze the generation of employment in the economy through tunnel forming Logistic model is estimated.

##### 4.1 Model 1

$$TGEMP = \beta_1 + \beta_2 ALCCF + \beta_3 ALCCV + \beta_4 ARLD + \beta_5 FEXP + \beta_6 FAG + \beta_7 FEDU + \beta_8 NWPRS + \beta_9 RRNT + \beta_{10} TCOSTF + \beta_{11} WAGCTF + \beta_{12} WAGCTM + \beta_{13} WAGPL + \mu$$

TGEMP= Total generation of employment in tunnel, ALCCF= Area of land cultivated for fruit., ALCCV= Area of land cultivated for vegetables, ARLD= Area of total land cultivated, FEXP= Farmer experience, FAG= Farmer Age, FEDU= Farmer education, NWPRS= No# of workers required par acres, RRNT= Rate of rent, TCOSTF= Total cost of fruit, WAGCTF= Wage cash + transport female, WAGCTM= Wage cash + transport male, WAGPL= Wage of permanent labor

**Table 1 Estimates of Equation of Total generation of employment**

Dependent Variable: TGEMP				
Method: Least Squares				
Sample (adjusted): 1 199				
Included observations: 199 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-59.25703	38.14141	-1.553614	0.1220
ALCCF	0.441236	0.107191	4.116368	0.0001
ALCCV	-0.119498	0.424727	-0.281352	0.7788
ARLD	1.848815	0.247349	7.474516	0.0000
FEXP	0.251317	0.397957	-0.631518	0.5285
FAG	-0.236031	0.258972	0.911413	0.3633
FEDU	0.235065	0.608608	-0.386233	0.6998

NWPRS	-0.915641	0.632496	-1.447662	0.1494
RRNT	-0.082113	0.246221	0.333493	0.7391
TCOSTF	-1.18E-05	8.11E-06	-1.450632	0.1486
WAGCTF	0.141718	0.078056	1.815592	0.0711
WAGCTM	0.045678	0.118004	0.387086	0.6991
WAGPL	0.073059	0.076045	0.960734	0.3380
R-squared	0.593557	Mean dependent var		49.64322
Adjusted R-squared	0.560241	F-statistic		17.81647
Log likelihood	-870.1037	Prob (F-statistic)		0.000000

The results of ordinary Least square OLS Model 1 is interpreted in Table 1.1%, 5% and 10% significance level is employed in the analysis of this study.  $R^2$  is 0.59 which shows that independent variables explain 59% change in generation of employment in tunnel farming in economy of Pakistan as shown in above the table. All variables show significance level. Table 1 expressed variation of generation of employment in tunnel farming in Pakistan. The coefficient of (ALCCV) area of cultivation of fruits and vegetables is positive to the employment generation and is showing 0.44% variation in generation of employment with one-unit increase of area of cultivation of fruits. ARLD area of land is positively related to the employment generation and is significant at 1% level and there are 1.85% changes in generation of employment with an addition of one unit of area of cultivation land as shown in above the table. Household size is one of the important independent variable that is positively related to the generation of employment in tunnel farming as shown in above the table. There will be 0.62 % variations in employment generation with one unit change in household size of farmer. As indicated by Chayanovian hypothesis of labor economy, the utilization family size in connection to the creation unit might be a vital determinant of modern technology selection (Hossain, 1989). Family size is joined to catch the impact of subsistence weight. The quantity of working individuals in the family may facilitate the work limitation and diminish hired labor necessity. In that capacity this variable is added to catch its impact. There has been significant open deliberation identifying with gender equity value and Technological change. It was progressively watched that advanced agrarian technology to a great extent displaced women from the rural work market, especially, in post-harvest operations. Number of working female individuals is fused in the capacity to watch whether ladies have

any impact in appropriation choice. Consequently, the contention that advanced technology builds power of occupancy (Bardhan, 1971) is accepted.

The signs of land ownership and farm size variables are negative, the latter being significant ( $p < 0.01$ ). The negative coefficient for farm size indicates that modern technology is adopted more in areas with poor land endowments. That is the smaller the farm size the higher the intensity to adopt modern technology in order to earn more income from limited resource base. This further implies that, contrary to the expected a priori hypothesis, economically unfavorable areas may have benefited more from the adoption of modern technology. This finding was initially upheld by Hossain et al. (1990) rather than the prior conclusion by Hossain (1989).

Age of the farmer is one of the important and major factors that impact the employment level in an economy. Age is negatively related to the dependent variable of this study. Because as the age of the farmer increases it decrease the working ability of the farmer due to which employment generation by tunnel farming reduces.

Education plays a vital role in development of tunnel farming and with the development of tunnel farming there is creation of employment in different sectors of the farm and educated farmer can handle better than an uneducated farmer because with knowledge the skills developed for betterment of the tunnel. As the educated farmer applies number of different technologies which required a member to handle that technology and that generates the employment level of the economy. Our analysis shows the direct relation of the education to the employment generation in tunnel farming work and it indicates 0.23 percent variations in generation employment to the tunnel farming with rise in one level of education. Education is also an important factor that takes part in development of an economy. It is a key factor for growth and development of a country. This outcome sports by Rehman (1998). Education level of the family unit head adversely impacts appropriation. The coefficient is significant at 10 percent level The comparison study also revealed the same results.

It is interesting to note that though total number working members in a household is positively related with modern technology adoption, number of working female members is significantly ( $p < 0.05$ ) negatively associated with adoption decision Number of working persons is also an important factor to impact employment generation. As number of workers rose it decreases the earning power of a farmer. It is negatively related to the employment generation in tunnel farming sector. This outcome bolstered

by Rehman (1998) Total number of working female in the family contrarily impacts the aggregate interest for work. A finding likewise saw in Hossain (1989).

The rented area of cultivation is also negatively related to the tunnel farming employment generation as with the rented area of cultivation it raises the cost of production and to control or reduced the cost of production farmer employs less number of worker which shows inverse relation o the employment generation as shown in above the table that shows 0.082 percent variation in employment generation and it is significant at 10 percent level. A finding also observed by Rehman (1998) Land ownership status is positively related to wage rates and is significant ( $p < 0.05$ ) when all crops are considered indicating that wage rates are higher in areas with large landowners. The technology variable, the area under modern varieties, is one of the most important variable which is significantly ( $p < 0.01$ ) positively related with wage rates indicating that labor wages are higher in areas with high level of diffusion of modern agricultural technology. Total cost of production is negatively related to the employment generation in tunnel farming the total cost of cultivation is inversely related to the employment generation and it shows 1.18 percent variations in employment generation as shown in the Table 1.

Wages rate of male and female is positively related to the generation of employment. When the wage rate increases it increases the opportunities to employment to the workers of an economy. As the high wage rate attracts more workers to join in the tunnel areas of the agriculture sector as expressed in the table. The female participation is more than men participation rate in tunnel farming as it is indicated in above the estimation of employment generation in tunnel farming sector of the agriculture sector. Average wage rate also shows positive and significant relation to the employment generation. It shows 0.073 percent variations to the employment generation in tunnel farming. Notwithstanding, past studies (Hossain 1989; and Hossain et al.1990) uncovered that technological development is a critical variable influencing wage rate. In the present study, the accompanying pay condition is fitted to the plot level information:

Despite the fact that it is generally perceived that current technology appropriation straightforwardly impacts the dispersion of pay over all classes of agriculturists and geological locales, the scale lack of bias of advanced technology has been genuinely condemned bringing about expanded assessments. This is obvious in the conclusion drawn by Free bairn (1995) from his examinations of 307 assessment ponders. In any case, analysts (e.g.Hossain, (1989); Hossain et al., (1990); and Ahmed and Hossain, (1990)) contend that cutting edge technology reception may likewise have roundabout impact through

operation of element markets, especially, the hired labor market. There those segregated by the coming of advanced technology would profit by a redistribution of pay through expanded wages inferable from expanded work request.

### 5.COMPARISON OF THE USE OF FERTILIZER AND PESTICIDE IN TUNNEL FARMING

In spite of the fact that pesticide has not been considered as a reciprocal contribution to be utilized as a part of conjunction with new seeds, fertilizers, and watering system while advancing dissemination of cutting edge agrarian technology, it by and by, turned into a noteworthy contribution to present day agri-sector. Pesticide use has various antagonistic impacts, running from toxication of soil and water bodies to human wellbeing impacts. The pesticides utilized for farming might be comprehensively grouped in four classifications: (an) organophosphate, (b) organ chlorine, (c) carbonate, and (d) parathyroid. As indicated by World Health Organization (WHO), pesticides of organophosphate and organ chlorine gathering are exceedingly perilous for human wellbeing (WHO, 1984).

Fertilizer is a noteworthy info required for the development of current assortments of rice and wheat. Compost sponsorships have been a noteworthy part of government strategy with an ensured dispersion framework since the early phases of cutting edge agrarian technology dissemination, the late 1960s. Be that as it may, with an expansion in the utilization of composts, the expense of endowment turned out to be high and made it hard to be managed by the administration. Besides, the essential arrangement of fertilizer sponsorship was to advance utilization of composts and dissemination of present day assortments of rice which were to a great extent effective as the yield rates multiplied in a range of 30 years. It ought to be noticed that the rate of endowment utilized as a part of compost appropriation experienced significant changes inside this period. In later years, amid the 1980s, the level of appropriation was slowly decreased lastly the sponsorship was formally expelled on December 1992 (Baanante et al., 1993)

**Table 3 Comparison of the use of Pesticide and Fertilizer**

<b>Crop</b>	<b>Wheat</b>	<b>Sunflowers</b>	<b>Tobacco</b>	<b>Tunnel</b>
<b>Pesticide</b>	3	3	2	35
<b>Fertilizer</b>	3	3	2	30

Note: The table shows use of fertilizer and pesticides per Acer times.

### 5.1 Sale and Marketing of tunnel Farm Products

Most of the Tunnel farmers are found the lack of marketing and selling facilities of their product. Middle man is earning a lot of money from farmers of tunnel due to lack of marketing facilities and due to lack of skilled labor force of marketing. The price of vegetables and fruits become very low in the peak season of tunnel due to lake of marketing and storage facilities. A huge amount of labor force cane be employed in tunnel farming if a better storage, marketing and sale facilities can be arranged by the authorities. As said before, in the focused business sector, price of inputs and yields are relied upon to be exogenous. Additionally, the price that agriculturists pay get for production incorporate transportation expense and merchants' profits which is liable to differ crosswise over farmers and areas, contingent upon the condition of infrastructure development. Higher soil ripeness status infers ideal physical condition for farming generation in this way builds trimming and land use force prompting increment in supply of yields.

Primarily markets situated inside 15 kms are the primary showcasing outlet for the products production in the study area. Around 25 percent of the farmers offer their items at the primary markets sector while 3 percent offer at the homestead door level and remaining offer at optional markets and/or development focuses additionally situated inside 15 to 100 kms. Couple of agriculturists really reacted on issues with marketing of yields. Among the individuals who reported of confronting issues reported to poor correspondence, low yield price and unlawful illegal brokerage fees as the significant ones. No single respondent in area reported to issues with marketing. Truth be told, every one of the towns in study territory are extremely very much spoken with the Tehsil headquarter where all infrastructural offices are accessible.

## **6. CONCLUSIONS**

Across the board debates exist on the postponed results of technological change or 'Tunnel Farming' technology in horticulture. The reasons can be to a great extent ascribed to the methodology used in dissecting the effect of technological change on country job and also the degree of issues secured in the assessment forms. The present study utilized an all-encompassing way to deal with assess the effects of the advanced farming technology dispersion in District Vehari of Pakistan from neighborhood viewpoint by tending to rustic work issues: regional development, food grain supportability, employment, income distribution and poverty. It has been seen that there is very nearly zero unemployment rate in Tunnel Farming Villages. Particularly Women employment rodent is high in this sort of cultivating. Results demonstrated that an unpredictable blend of qualities and a few

shortcomings are interwoven with this exceptionally announced mechanical leap forward (Tunnel Farming) in horticulture that should be deliberately screened so as to prepare for future rural advancement arranges. In spite of various positive effects of this technological change in expanding sustenance creation, salary, work and component costs, it has additionally expanded local uniqueness, pay imbalance and destitution and is some kind of risk, especially, soil richness, human wellbeing, fisheries, and water quality. Likewise, the declining profitability and development of wheat rice and tobacco assortments in Tunnel Farming ranges, a noteworthy vehicle of this innovative achievement, is raising questions on supporting sustenance grain generation later on. Be that as it may, a fascinating component rose up out of the union of the multifaceted effects. It is watched that the 'medium adopter of Tunnel Farming' towns, portrayed by adjusted a choice of cutting edge assortments, broadened trimming framework, with bigger area blessing, better soil ripeness and created provincial foundation performed better and is connected with most elevated per capita pay and minimum pay imbalance and neediness and high rate of work. The outcomes, consequently, challenges the customary thought of heightening cutting edge technology reception as the way to agrarian advancement and economic development. Or maybe, it sets up the way that 'adjusted selection is impartial'.

All things considered, a coordinated model of farming development plan is sketched out utilizing the SWOT analysis in view of the multifaceted effects of Technological change. The proposed vital advancement arranging is seen as an integrated model including (1) balanced modern technology diffusion, (2) crop enhancement, (3) soil fertility administration, (4) provincial infrastructure development, (5) price strategy and (6) economic broadening.

At last, it can be inferred that Pakistan need agricultural technologies that are work concentrated, give equal with chances to men and ladies, smoothen wage disparity, diminishes neediness and applies slightest impact on the earth. In this way, an appropriately planned harvest expansion arrangement and its execution would be an initial move toward the objective of accomplishing practical improvement. Additionally, usage of economic diversification policy arrangement and rural infrastructure will promote supplement the interest for reasonable agriculture development in Pakistan.

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