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Article:	**Effects of Climate Change on Agriculture in Pakistan: A Social Media Analysis**
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ABSTRACT

Social Media has become an important element of our life as we depend on it for getting information about every aspect of life. Given study was aimed to find association between social media reporting of climate change and pattern of attitudes by the farmer in the Punjab province of Pakistan. Correlation-experimental research design was used to found the relations and effects of climate change on agriculture. Purposive sampling technique was used to collect sample of 120 male farmers from all cities of Punjab with age ranging (30-80) years. Online survey questionnaires in form of Google doc was used to collect participants' response of what type of behaviour they used to adopt when got information of climate change through social media. Two Self-constructed questionnaires (i) Measuring of Farmer's Behaviour Influenced by Social Media Reporting of Climate and (ii) Effects of Social Media Reporting of Climate Chang on Agriculture were used after finding its reliability and validity through piloting. Data was analyzed by using SPSS-21. Correlation Analysis was done to find out the relationship between social media reporting and Farmers' behaviour, Linear Regression was used to find predicting social media reporting of climate change farmer's attitude to adopt precautions to increase annual yield and agricultural production in Punjab. Discussion and conclusions was made on results obtained. Results of the study would be applied to increase agricultural and rate of annual yield through productive adaptations of behaviour of farmers.

Keywords: Agriculture; Social Media Reporting; Climate Change; Behavioral Patterns

1. Introduction

The reporting of social media is one of the easy mediums to approach and has become a very important part of modern lifestyle, educational as well as domestic and economic perspectives. Internet and social media is not only offering us to increase our knowledge and connectivity but also enable us to improve our behaviour measures to improve economy. Agricultural development and level of production is increasing with timely reporting of climate change through social media. Farmers modify their attitudes and steps taking behaviour as they receive reporting updates of climate through social media (Raja & Nagasubramani, 2020).

Agricultural development is essential for every nation not at individual level but also for industries to increase its production. Agricultural products of Pakistan are exported to other countries. Every year agricultural conditions got worse at the time of cultivation of crops due to sudden change in weathercast as farmers' usually are unaware of weather change due to lack of information. Social media is providing climate change with regards to rain patterns, fluctuations in temperature, air humidity etc. that may result in effecting variety of crops.

1.1 Social Media Reporting of Climate Change

Reporting of climate change around the globe is a big challenge to meet for the social media. Social media use telephonic service, FM radio, Facebook and WhatsApp information transmitting groups to update its audience. State taking up actions to explore the social media services to increase farmers exposures in Punjab that tend to increase agricultural outcomes in Pakistan. Social media performance and farmers' satisfaction of climate change reporting influencing behaviour change in high and low income farmers (Pinkleton & Austin, 2009).

Social media now a day's providing instructions as well as agricultural supplements to support agricultural production in Pakistan. Channels provide set of informative programs relating to irrigation of desired crops suitable for the specific area. Techniques to protect of seed before irrigation from numerous pest attacks is practiced by agricultural workers to a lay man who do not have access to social media reporting and guidance directly. Applications of social media providing learning environment even to the farmers at small level having less amount of cultivating land (Naz & Akbar, 2008).

Agriculture serves as fundamental role not for human welfare but also for industrial interest. Productivity rate and annual yield completely depends upon the climate as an important factor for agriculture productivity. This is the reason that many researchers have been of interest in this regard to find potential effects on hydrologic balances and livestock's. Heat balances, organic substances and distribution of climate are the important components of agriculture. Parameters of climate that reported by social media are including temperature validity, air humidity, rain patterns in different local languages through television transmissions, FM radio, paper presentation on agricultural developments to increase farmers awareness and knowledge. (Walthall et al., 2013).

1.2 Social Media Reporting and Farmer's Behaviour

Farmers' are the community members who at most experience lack of availability to reach social media platforms. So, many of the magazines advertise through image presentation of weather at daily, weekly and monthly time periods to get aware of farmers and make them able to precaution measures if needed. Magazines and newspapers also get reach to farmers through agricultural officers and dealers bought cheaply as they have informative, attractive eye catching attributes (Machine, 2004).

Climate change set up many challenges for both the farmers and social media platforms to transmit updates. One of the important challenges of weather change is severity of its outcomes depending upon time and place as risk could not be perceived or estimated as it's a natural phenomenon. Farmers' geographical values, social dimensions, diversity of the land and weather uncertainty tend to increase or decrease the effects of climate change. Perception of farmers and agricultural experts for future wave of weather change depends on their past experiences of climate and time of its peak that helps to regain the agricultural products. Behaviour modification related to crop selection needs high level of cognitive evaluation (Haden et al., 2012).

1.3 Objectives of the Study

Given study was aimed to find the effects of social media reporting of climate change and patterns of behavioural strategies adopted by farmers' to improve agricultural conditions in Punjab.

- To explore the role of social media reporting of climate change and its association with increase in agriculture production in Punjab.
- To find the effects of social media reporting of climate change on the patterns of farming followed by famers in Punjab.
- To find the association between social media reporting about rain patterns, frequencies of droughts, temperature change and farmers' behaviour of crop selection in Punjab.
- To identify the predicting role of social media reporting of climate change and farmer's behavior to select suitable fertilizers to reduce pest attack.
- To explore the relationship between social media reporting of rain-fed farming and farmer's behavior of crop diversification.

2. Literature Review

In the light of previous literature relationship between Social Media reporting and Climate Change was described as positively correlated. Literature has reported climate change effect negatively to agricultural outcomes and also has negative correlation with agricultural conditions.

2.1 Climate Change and Farmers' Behaviour

A research was conducted to evaluate farmer's behaviour towards crops and weather casting. 48 farmers and farm managers were selected as research sample that grew two crops of vining peas and navy beans. It was calculated that farmers perceived climate change in both positive and negative aspects as they showed little consideration of climate change towards growing plants. Farmers were reported of climate change as a challenge for the crops and as possibility of new crops. Most of them considered logistic of climate change and accordingly adjusted their behavior, and irrigation plan including cultivation time and seeds variety. This found a positive relationship between climate change and attitudes of farmers to increase agricultural products (Holloway & Ilbery, 2006).

The susceptibility of the agricultural subdivision to both climate change and inconsistency of social media reporting is well conventional in the literature. Change in climate in term of change in temperature, rain patters or air humidity result in changing farmers'

behaviour to adopt managements of land and water regimes that will subsequently affect agricultural productivity (Kurukulasuriya, 2013).

2.2 Effects of Climate Change on Agriculture

Climate change effects agriculture in many ways around the world in almost every sort of region. As because of its sudden climate change diversity the crops are difficult to manage and to protect them from weather change.

2.2.1 Economic Effects of Weather Change on Agriculture

Economic impacts of climate change also tend to change farmers' behaviour in positive and productive way. As agriculture is sensitive sector of all business that is way due to its sensitivity and size agricultural products have more tendencies to be affected by climate change. Agriculture is at high risk of harming effects in all under developed countries. In Asia, where regions are already very hot to provide less developing space for the farming and result in less yield annually. Global warming and climate change result in reducing productivity and in turn reduce commercial rates of agricultural products in market. Persistent economic loss in agriculture due to climate change is reported by many researches which could be resolved by modifying farmer's behaviour in adapting new skills to reduce economic crises in agriculture due to climate change (Mendelsohn, 2008).

2.2.2 Effects on Water Resources

Second observable effect of climate change is the availability of water resources. Effects of water resources and hydrological cycle are considered major effects of climate change on agricultural productivity. A study was conducted to check climate change effects on water cycle and production in 2020 on China's crop production. Increase in temperature also increases rate of evaporation and respiration in plants uses more water than usual. According to the analysis, agricultural water demand in south China is projected to decrease generally, and the crop land soil-moisture deficit would decrease due to climate change (Tao et al., 2003).

2.2.3 Climate Change and Famers' Behaviour towards Water Resources

Precautions of water trading by using hydro economic model that examine less water use in the process of irrigation. Farmer's behaviour towards soil fertility and tendencies of growing crops in dry extreme scenario can increase agriculture productivity in availability of less water resources. Growing the agriculture plants in basin is another technique to reduce water use in presence of climate change or global warming. Agricultural products growing in basin are less likely to effects by the wave of temperature change. Drought and tolerance crops are a less consuming water crop which leads the farmer for learning best extensions of irrigation and advanced planting (Jiang, & Grafton, 2012).

2.2.4 Hypothesis of the Study

Following proposed hypotheses were tested to be approved or disprove based on statistical analysis of farmers' responses.

2.4.1 Hypothesis of Correlation

- There will be significant positive relationship between social media reporting of climate change and crop selection to increase agriculture productions in Punjab.
- There will be significant positive relationship between social media reporting and farmers' adaptation toward the use of advance fertilizers to reduce pest attack in Punjab.

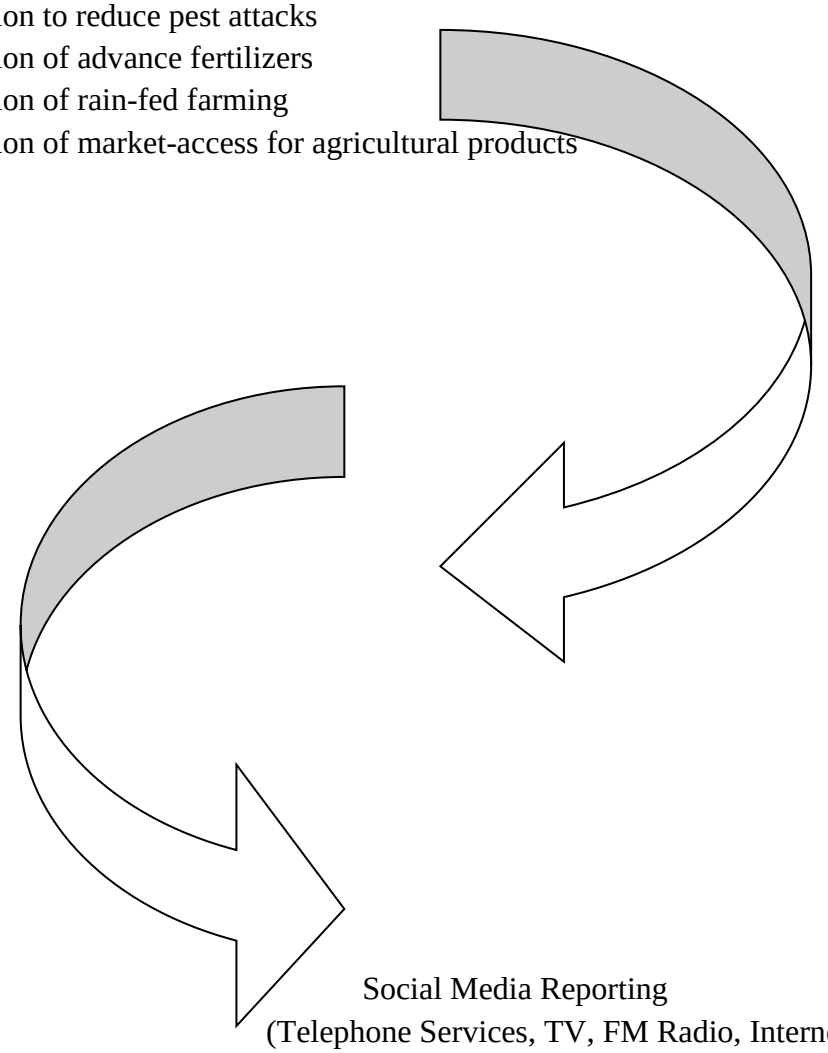
- Social media information will have significant positive correlation with farmer's strategies to store water drainage to increase yield in Punjab.

2.4.2 Hypothesis of Prediction

- Social media reporting of climate change would significantly likely to predict farmers' annual realization of weather and dynamic adaptations in agriculture
- Social media reporting of climate change would likely to predict farmer's field experiments, land values, and soil management skills.

2.5 Proposed Model of Significant Effects of Media Reporting of Farmers' Behaviour

Information of weather change, rain patterns, and temperature fluctuations
Information to reduce pest attacks
Information of advance fertilizers
Information of rain-fed farming
Information of market-access for agricultural products

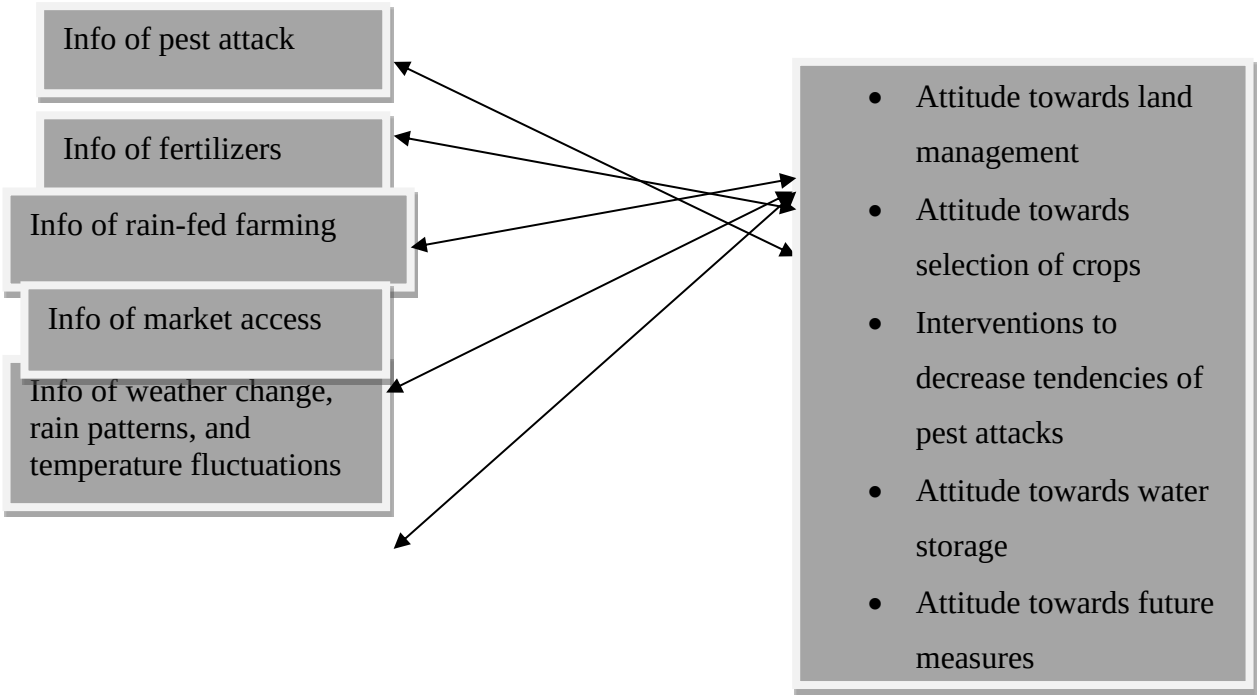


Social Media Reporting
(Telephone Services, TV, FM Radio, Internet)

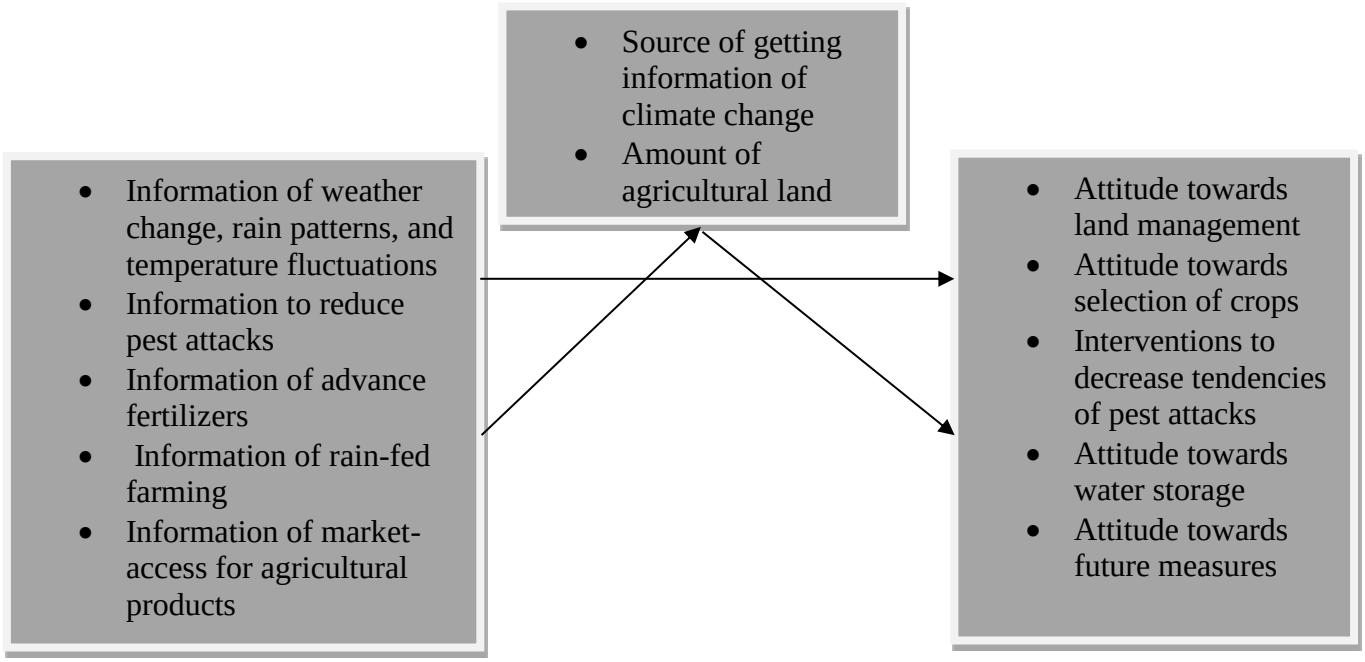
Attitude towards land management
Attitude towards selection of crops
Interventions to decrease tendencies of pest attacks
Attitude towards water storage
Attitude towards future measures

Figure.1: *Possible Effects Social Media Reporting of Climate Change and Farmers' Attitudes to Increase Agriculture in Punjab.*

2.6 Proposed Model of Association between Social Media Reporting of Climate Change and Agriculture in Punjab



2.7 Proposed Model of Prediction of Farmers' Behaviour through Social Media Reporting of Climate Change



Methodology

Under quantitative research correlation-experimental research designed was used to found the association between climate change and agricultural production rate in Punjab.

Furthermore, effects of social media reporting of climate change on farmers' behaviour adaptation were found.

3.2 Population and Sample

120 male farmers, agricultural officers and land professional were selected who had direct contact with farmers and social media sites, from different cities of Punjab based on the amount of agricultural land they had. Farmer's having more than 25 Acer of agricultural land were included as sample because of their vast level of experience of using precaution measures of weather every year and higher tendencies of behaviour adaptations in response to climate change reported by social media.

3.3 Sampling Technique

Purposive sampling technique was used to select sample for the purpose of research. As agricultural officers were contacted and questionnaires mailed so they can contact farmers and record their responses to each statement of the questionnaire.

3.4 Inclusion Criteria

Sample having following characteristics were included in the study:

- Only male farmers' were included.
- Farmers' having more than 25 Acer agricultural lands were included.
- Farmers' from different cities of Punjab were included.
- Both married and unmarried farmers' were included.
- Farmers who had irrigation and cultivation experience was included.

3.5 Exclusion Criteria

Sample with following characteristics were excluded from the study.

- Female participants were not included due to study purposes.
- Farmers' other than Punjab province were not included.
- Farmers who gave their agriculture land on lease and not had any experience of agriculture were not included as sample.

3.6 Instruments

3.6.1 Demographic Information Sheet

Demographic characteristics of the participants were collected using demographic sheet including information of age, gender, belonging city/town, amount of agricultural land, their behaviour tendencies and medium of social media they used to get information of climate change over time. Purposes to collect demographic information was to find any characteristics belongs to farmers' that can act as mediating or moderating the relationship between climate change and rate of agricultural production. Participants behavioural tendencies to adopt precautions to protect their crops from pest attacks and assuring proper water availability influenced by social media reporting was asked in demographic characteristics.

3.6.2 Measuring of Farmer's Behaviour Influenced by Social Media Reporting of Climate

Instrument measuring farmer's behaviour influenced by social media reporting of climate change was constructed for the purpose to measure behavioural tendencies of farmers. It was five-point Likert scale ranged1= not at all to 5=always for a response of asking particular behaviour after social media reporting of climate change. Questionnaire was at first administered on 25 participants to check its reliability in form of piloting study. Questionnaire

was observed having good reliability shown by the value of alpha. Statement of the scale that participants felt difficulty to understand was removed and changed into easy understandable language after pilot study. Score of the scale was calculated by simply adding numeric for each response. Scale was divided into 5 subscales to measure different behaviors. (i)Attitude towards land management (ii) Attitude towards selection of crops (iii) Interventions to decrease tendencies of pest attacks (iv) Attitude towards water storage (v) Attitude towards future measures.

3.6.3 Effects of Social Media Reporting of Climate Chang on Agriculture

Social media reporting and its effects on agriculture was measured using self-constructed questionnaire. It was also 5-point Likert scale measuring social effects ranging 1=strongly disagree to 5=strongly agree to collect farmers consent to each effect of social media reporting on agriculture. Reliability check of the questionnaire was calculated through pilot study. This scale was divided into 5 subscales measuring different effects including (i) information of weather change, rain patterns, and temperature fluctuations (ii) information to reduce pest attacks (iii) information of advance fertilizers (iv) information of rain-fed farming (v) information of market-access for agricultural products. Scores of the questionnaire was collected by computing score for each statement in the questionnaire.

3.7 Data Analysis

After proper collection and recording the data was used for suitable analysis. Pearson Product Moment Correlation Analysis was done to evaluate nature and kind of relationship between variables. Linear Regression was carried out to find predicting role of one variable for other. Independent sample t-test was used to evaluate effects of social media reporting of climate change on agriculture in Punjab.

Results

Farmers' patterns of behaviour and influenced attitudes were measured systematically in a pattern of analysis. Agricultural conditions in Punjab and annual yield affected by timely reporting of social media through various platforms were also analyzed. Constructed questionnaires were circulated and responses for the statements to measure behaviour were collected. Collected data for research study was analyzed by using Statistical Packages for Social Science, version 21(SPSS-21).

4.1 Reliability Analysis

Table below shows the value of reliability for selected items to measure the impact of climate change on agriculture reported by social media and farmer's behavior influenced by social media reporting of climate change was moderate to high.

Table 4.1

Psychometric properties of questionnaires (N=120)

Variables	***K***	***M***	***SD***	**α**
Measuring of farmer's behaviour influenced by social media reporting of climate change	13	48.62	5.52	.709
Effects of social media reporting of climate change on agriculture	7	9.672	3.110	.734

Note. k= Number of items in Scale, *M*=Mean, *SD*= Standard Deviation, α= Reliability Co-efficient.

Table 4.1 showed the results of reliability analysis for two questionnaires - measuring of farers' behaviour influenced by social media reporting of climate change and effects of social media reporting of climate change on agriculture. Value of Alpha showed moderate to high reliability of the scales showed consistency and accuracy of the responses and scale reliability what is supposed to measure.

4.2 Descriptive Statistics of Demographics of Participants

The descriptive of demographics characteristics of sample like age, gender, occupation, amount of household and agricultural land and average income were calculated by using frequencies and percentage. Moreover, participants' source of getting information of weather change was also recoded and frequencies were extracted.

Table 4.2: *Descriptive statistics of gender of participants*

Category response	Frequency	Percent
Male	120	100
Female	0	0.00
Total	**120**	**100.0**

Table 4.2 indicated that according to gender responses the male frequency of respondents were 120 and had percentage of 100% and female frequency of respondents had percentage of 0%. While (M=1.00) and (S.D. = 000).

Table 4.3: *Descriptive statistics of occupation of participants*

Category responses	Frequency	Percent
Farmers	93	77.5
Agricultural Officers	27	22.5
Total	**120**	**100.0**

According to the table 4.2 occupation frequency of respondents showed out of total participants there were 93 farmers and had percentage of 77.5% and 27 agricultural officers had percentage 22.5 %. (Mean= 1.225) (SD= .4193).

Table 4.4: *Descriptive statistics of education of participants*

Education	Frequency	Percentage
Primary	12	10.0
Middle	11	9.2
Matric	11	9.2
Intermediate	30	25.0
Above	43	35.8
Illiterate	13	10.8
Total	**120**	**100**

Table 4.4, the education of respondents showed that highest frequency of participants had above education than intermediate were 43 and had percentage 35.8% of total sample. While (M=4.00) and (S.D. =1.472).

Table 4.5

Descriptive statistics of average income of participants

Response category	Frequency	Percent
50000-100000	24	20.0

110000-200000	2	1.7
210000-30000	15	12.5
310000-400000	30	25.0
Above	49	40.8
Total	**120**	**100.0**

Table 4.4, showed average income of the participants influenced through climate change updates by social media. Table showed the higher frequency of the participants with average monthly income (310000-400000) are 49 and had 40.0%, while (M=3.6500) and (S.D. =1.5154).

Table 4.6

Descriptive statistics of amount of household land of participants

Category response	**Frequency**	**Percent**
1-2 Acer	69	57.5
3-4 Acer	51	42.5
Total	120	100.0

Table 4.6 showed amount of household land of farmers belonging different areas of province of Punjab. Most of the participants 69 (57.5) had 1-2 Acer of household land. While (M= 1.4250) and (S.D. = .4964).

Table 4.7

Descriptive statistics of agricultural land of participants

Category response	**Frequency**	**Percent**
25 Acer	20	16.7
60-100 Acer	20	16.7
110-150 Acer	47	39.2
Above	33	27.5
Total	**120**	**100.0**

Table 4.7, showed frequencies and percentages of amount of agricultural land participants had. In the category of 110-150 Acer of agricultural land got highest frequency of participants were 47 and had 39.2%. While (M= 3.608) and (S.D. =1.342).

4.3 Pearson Product Moment Co-relation Analysis

Pearson Product Moment Correlation Analysis alternate to spearman correlation was followed to found association between different aspects of behaviour of the farmers influenced by the updates of weather change and climate fluctuations by social media. Correlation between the effects of social media transmission of information for the selection of crops, prevention from pest attacks and farmers attitudes towards precaution measures was also analyzed.

Correlation analysis was aimed to test given hypothesis. (i)There will be significant positive relationship between social media reporting of climate change and crop selection to increase agricultural productions in Punjab. (ii)There will be significant positive relationship between social media reporting and farmers' adaptation toward the use of advance fertilizers to reduce pest attacks in Punjab. (iii)Social media information will have significant positive correlation with farmer's strategies to store water drainage to increase yield in Punjab.

Table 4.8

Table showing relationship between farmers patterns of behaviour and social media reporting of climate change

Variables	***2***	***3***	***4***	***5***	***6***	***M***	***SD***
1.Effects of social media reporting	-0.22	.193*	0.74*	0.15	0.24**	2.00	1.08
2.Farmers attitude for selection of crops	-	.615**	.167*	1.90*	-091*	2.06	1.145
3. Farmers attitude for land management	-	-	.147*	.089**	.110**	2.09	1.08
4. Farmers attitude to decrease pest attacks	-	-	-	.062*	.055**	2.00	1.149
5. Farmers attitude to water storage	-	-	-	-	.197*	2.39	1.1086
6. Farmers attitude for future measures	-	-	-	-	-	2.02	1.876

Note: N= 120

Table 4.8 showed association between the effects of social media reporting of climate change and different patterns of behaviour adopted by the farmers to increase agricultural outcome in Punjab. (I) hypothesis to found correlation between social media reporting of climate change and farmers attitudes towards crop selection was rejected because of the value was not significant in nature ($p>0.5$). (II) Hypothesis to test significant correlation between social media reporting and farmers attitude towards land management and decreasing tendencies of pest attacks was approved as value of ($p<0.5$) as well as in positive direction. (III) Results of correlation analysis also found non-significant relationship between social media reporting and farmers attitude of water storage, describing non-recorded measures were taken by the farmers when they got updates of sever summers or lack of water. Results found significant positive association between social media reporting and farmers attitudes to take steps for future interventions to prevent cops and management system for seed protection of next crop $p<0.005$.

4.4 Linear Regression Analysis

Linear Regression Analysis was conducted to find predicting role of social media reporting of climate change and effects on farmers' behaviour tendencies towards agricultural production in Punjab. (I) Social media reporting of climate change would significantly likely to predict farmers' annual realization of weather and dynamic adaptations in agriculture. (II) Social media reporting of climate change would likely to predict farmer's field experiments, land values, and soil management skills, were hypothesis to test through regression analysis.

Table 4.9

Linear Regression Analysis of climate change predicting farmers patterns of behaviour adopted as a result of social media reporting (N=120)

		Effects of Social Media Reporting
Predictor	*ΔR^2*	*β*
Step 1	3.41	
Control variables		0.25*
Step 2	2.43	
Farmers attitude for selection of crops		.313**
Farmers attitude for land management		.410
Farmers attitude to decrease pest attacks		.334**
Farmers attitude to water storage		1.72*
Total R^2	1.03	
N	120	

Note. ΔR^2 = Significant Change, β= Standardize Coefficient

Above table showed results of Linear Regression Analysis, effects of social media reporting acted as predicting patterns of behaviour for selection of crops, land management, attitudes to decreases tendencies of pest attacks and water storage. Hypothesis of significant prediction among variables was approved except for farmers' attitude towards decreasing tendencies of pest attack where value of significant beta was not significant in nature F (34.3) =2.56, p<0.005.

Discussion

Evaluated results of given research study showed effectiveness of famer's behaviour patterns influenced by the climate change reporting of social media. Social media is now having diverse effects on every aspect of life be its personal, political, social or economic in nature. Agricultural field is also influenced through social media implications and services. Reporting of climate change is another challenge to mold the behaviour of employees and farmers to timely implement the set of precautions leading to increase agricultural productions. Literature supporting the results of present study was related with each evaluated result and hypothesis in the light of finding measures.

4.3 Social Media Reporting and Farmers Behaviour

Social media uses different platform and social networking sites to acknowledge farmers and agriculture related economist about climate change and weather forecasting. A study concluded the weather change content on different networking platforms affecting the pattern of agricultural productions. Farmers' behaviour, actions and efficacy of the actions towards the adaptation of measures in response to climate change is highly influenced by social media reporting. NGOs in 38 community regions were selected as source of transmitting information of weather change and observation of farmer's behaviors were recorded. It was concluded that farmers change their techniques of handling crops and household farming with reporting of climate change (Vu et al., 2020).

Cite from a research was aimed to estimate the percentage of farmers behavior adaptations response to climate change. Behavioural scales and open observations were conducted to record hypothesized results. It was concluded that 66 percent of farmers showed immediate adaptations and behaviour change to show they were following global heating awareness for agriculture. As farmers affected at most due to weather change they were

reluctant to change their patterns of action to resolve future acceleration (Prokopy et al., 2015).

5.3 Climate Change Reporting and Crop Adaptation Strategies

According to a research study by Raza, biotic and a-biotic stressors of agricultural stocks had influential factors and correlate with strategies to select crops suited for specific region. Temperature fluctuation, changes rainfall patterns, heat stocks and modifications to weed and pest are commonly effect agriculture. Level of CO within soil changed with persistent change in weather. Different crops have different effects of climate change due to compositions and seal level for specific crop. Study concluded that farmer's behaviour of adapting selection of seeds and changing of crop correlated with weather change and reporting of weather change (Raza et al., 2019).

5.4 Climate Change Reporting and Adaptation to Pest Attacks

Present study found significant positive correlation between social media reporting of climate change and farmer's behaviour measures to reduce pest attacks. A study also concluded the same results by illustrating weather change causes to increase and decrease level of carbon dioxide which lead to decrease the level of nitrogen content from the leaves and lower body of the plant. Weather change makes the plants prone to pest attacks easily. Social media provides information about pest attacks and suitable for soil fertility in changing weather (Dhanush et al., 2015).

5.4 Conclusion

Agriculture in Punjab was concluded as being highly effected by weather change and climate forecasting. Production rate of agriculture also affected through the difficulties to access market due to weather change. Present study found significant correlation between social media reporting of climate change and farmers behaviour adaptations to increase agricultural productions in Punjab. Descriptive of the mediating variables, demographic characteristics of the participants were measured and reliability analysis was conducted. Study also found significant positive relation between farmer's attitude and adaptation to crop selection and social media reporting of climate change. Water storage techniques, reduction in pest attacks measures, land management and future measure of increasing soil fertility are significantly association with weather change updates by social media.

Social media reporting concluded to be significantly predicting patterns of farmers' behaviour towards the adaptation of advance measures to select crop, reduce pest attacks, land management and water storage.

5.6 Suggestions

Following suggestions should be followed in future researches to measure the relevant aspects of the study.

- Comparison studies should be carried out to find the effects of specific pesticides in weather change conditions to check before and after effects.
- Studies should be conducted to compare the behaviour adaptations of the farmers of Punjab with other provinces of Pakistan because of weather diversity.
- Qualitative research should be conducted to explore the nature of techniques farmers usually use to minimize the effects of climate.

- Research should be conducted at the time of irrigation to collect situational responses of the participants for effective phenomenon.

5.7 Implications of the Study

Present study has following implications related to agriculture.

- Study would be implement to increase the tendencies of desirable behaviour of farmers' to crops irrigation, crops protection measures, cultivation process by the use of information transmitted through social media about climate change.
- Study will increase the effectives of updates of climate change through social media as it can lead to increase agricultural productions.
- Study will increase farmers' level of reliance on social media for weather forecasting.
- Study will increase the efficiency social media forums, news channels, social sites and TV programs of weather updates because of farmer's dependency for seeking information through Social Media.

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Appendices A

Demographic Information

1. Age…….
2. Gender……..
3. Education……..

4. Occupation……..
5. Designation…….
6. City name……
7. Average Income…….
8. Amount of Household Land…….
9. Amount of Agricultural Land……
10. Have you got cultivation land on lease
    a. Yes
    b. No
11. How long you have been in the field of agriculture…….
12. Do you have access to social media for climate information
    a. Yes
    b. No
13. Do you have access to markets for agricultural productions
    a. Yes
    b. No
14. Which one is your source of getting information of climate change
    a. Television Broadcast
    b. Mobile phone
    c. Frequency Modulation
    d. Internet

Appendices B

Measuring of Farmer's Behaviour Influenced by Social Media Reporting of Climate Change

`Not at all	**To some extent/slightly**	**Moderately**	**Very much true**	**Always**
1	2	3	4	5

1. Adjustments in planting dates for better irrigation is follow by media reporting about weather change.
2. Seed protection for seasonal crops suggested by social media results in increasing agricultural income.
3. Farmers took steps to increase soil fertility after getting updates of weather change though social media.
4. Selection of crops variety is highly influenced by social media reporting about sudden change in climate.
5. Cultivation timing changes by the farmer when they know about weather change through social media.
6. Protection of crops from pest attack and maintaining yield is due to updates of climate change through Social Media.

7. Covering crops to protect soil from erosion, heavy rain fall and temperature adopted by farmers due to reporting of weather forecasting by social media
8. Farmers' efforts in building of soil organic matter and drip irrigation are influenced by Social Media reporting.
9. Advance adaptations to water storage are followed by climate change updates by social media.
10. Harvesting time and crop storage to reach markets influenced by Social media reporting of climate change.
11. Seed storage techniques for future crops are adopted by farmers due to weather update by social media.
12. Field experiments of different crops and annual weather realization are highly influenced through media reporting of temperature and rain fall patterns
13. Crop diversification, changing crop variety and change in fertilizers are adopt after social media reporting its benefits to increase growth of crops

Key Objectives

- Attitude towards Land Management
- Attitude towards Selection of Crops
- Interventions to decrease tendencies of Pest Attacks
- Attitude towards Water Storage
- Attitude towards future Measures

Appendices C

Effects of Social Media Reporting of Climate Chang on Agriculture

1. **1: Strongly Disagree 2: Disagree 3:Neutral 4: Agree 5: Strongly Agree**

1. Social media extensions are providing extreme weather events, snowstorms and temperature changing updates to increase agricultural productions in Punjab
2. Frequency Modulation radio station are transmitting information of pesticides via different local languages to increase agricultural rates in Punjab
3. Television broadcasting and community leaders become source of information regarding farming and climate change for agriculture in Punjab
4. Different news channels are providing dynamic adaptation to climate change and strategies to reduce damages in agriculture in Punjab
5. Access to climate information increase awareness about the impacts of climate change on agriculture and support in adopting actions against climate change in Punjab
6. Famers' are willing to follow suggestion given by social media platforms and external institutions giving consequent facts to increase agriculture in Punjab
7. Social media reporting about rain patterns promotes livestock and rain-fed farming with low consumptions of fertilizers in Punjab
8. Information of weather change on daily basis along with the change in prices of livestock, dairy farms and fertilizers through mobile services and social media groups are now improving agriculture conditions in Punjab
9. Farmers' of Punjab are adopting new strategies to deal with decrease in rain fall and increase frequency of droughts reporting by social media

10. Insufficient information by social media for farmers' to get access to suitable markets decrease agriculture practices in Punjab

Key Objectives

- Information of Weather change, rain patterns, and temperature fluctuations
- Information to Reduce Pest Attacks
- Information of Advance Fertilizers
- Information of Rain-Fed Farming
- Information of Market-Access for Agricultural Products