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IDENTIFY THE CHALLENGES OF RICE PRODUCTION AND COPING STRATEGIES IN NAROWAL

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ABSTRACT
Rice is the major source of food. Globally, rice also provides food security and nutrition. The demand of rice increased day by day because the world population increased rapidly, and the demand of food also increased. The good production of rice depends on water management, pest control disease, soil fertile and seed. Climate change, water scarcity, fertilizer, labor shortage, market access and famer literacy rate are the common challenges that inter linked and faced everywhere. The aim of this article is to describe the demand for rice socially, culturally and globally. Water is the most important component for the production of crops. Rice is the second staple food for Pakistan after wheat but in some countries, it is the primary staple food for more than half the world's population, and Asia, South America and Sub-Saharan Africa are the largest consuming regions. Rice exports increased Pakistan agricultural revenue, employment and famers livelihood. This research was conducted in district Narowal, Punjab, Pakistan. The questionnaire method was used for data collection. Field notes and observation checklist were the tools that were used to collect data. The sample size was 40 and probability sampling technique was used. Simple random sampling techniques (SRS) was used. All respondents were farmers. Statistical Package for the Social Sciences (SPSS) software was used for analysis of data. Rice is major source of food for Pakistan and sustainable rice production is important to meet the world's expanding demand for this staple commodity to reducing environmental effect and increase the effective and adorable use of technology.
Key words: Rice Production, climate change, food security, Soil fertility, Water scarcity, export and sustainability.

INTRODUCTION
Rice is the second staple food in Pakistan. But rice is the first staple food in some countries example China. More than the half of world population relying on this crop especially Asian countries. 508.7 million tones production of rice globally estimated 75% rice produced in the flood areas. Rice crop grown in kharif season. Many others crop also like groundnuts and cotton are also grown in kharif season. Various methods are used for rice growing. One method is direst seed sowing which is used in flood areas. 75% of rice transplanted in flood condition. The growth or production pattern of rice varies because annually our climate and weather pattern gradually changed. That has a strong impact on the agriculture sector in the world, not any particular country. Every country faces climatic challenges and loss of much portion of agriculture crops. according to the National Bureau of Statistics, China is world 1st rice producer's country in the world. 65% of the population considered that rice is their staple food. (Huang, M. 2022).

In 2021, 210 million tons' rice produced in China by utilizing of rice land almost 30 million hectares. Various kinds or types of rice are growing in China like Indica, and japonica are much. Ministry of Agriculture in China introduced a new type of rice is hybrid rice after breeding of rice. Pakistan also included world top ten countries that face all these issues. Water scarcity is the main issue in today's world that tell us whole crop production depends on water. Turbines and generators fall under agriculture equipment. China used various technologies and methods for better production and sustainable development of their agriculture especially rice. (Nadeem and Farooq, 2019; Nawaz et al., 2019).

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Today the world population has increased rapidly, and demand for food has also increased. In 2019, China export 4.5% rice in the world and beat the competition of rice producers' countries included India, Pakistan, Bangladesh, Indonesia, Brazil, and Thailand. and this production are much more increased in 2020 and 2021 after the use of good fertilizers, pesticides and used good and essential nutrients that maintained the soil fertility and help out the plant growth and production. In economically way, China is the stable and independent country. According to area wise Pakistan has 10 number in the world for high aroma, quality, and basmati rice production. (Aski et al., 2019).

Basmati rice is highly prized in globe some reason good taste, smell, aroma, long grain size. Super Basmati also famous and good in taste are useful. And Pakistan also export rice like super Basmati to foreigner countries. The rapid increase in population, cost of crops and economic growth, per capita income and other foods all influence the cost of rice. used alternative ways for more production in less water by the use of technology. And technologies are those types which are less friendly to environment. Without a healthy environment we cannot survive. Toxic environment generated list of diseases that have strong impact on human beings, plants and animals as well as (Maclean, Dawe, Hardy, and Hitter 2002).

Climate has much influenced on every crop, in fact human health. So, there are two sections of crop described. One is Rabbi and second is Kharif. The kharif and Rabi crop have their own time of sowing, seeding, cutting, harvesting. So, set some rules of crop polices for profitable and better production to achieve sustainable goals in future. Also, good production ensures food security in the country or world. China has less chance of crop effected diseased raised through filed. Wat is the reason behind this. China is economically strong country. That has the capacity to import and export its material to foreign countries (Ray et al. 2019; Almeria et al. 2020).

Climate has much influenced on every crop, in fact human health. So, there are two sections of crop described. One is Rabbi and second is Kharif. The kharif and Rabi crop have their own time of sowing, seeding, cutting, harvesting. After wheat and maize, Rice is the second staple food in Pakistan, but rice is also considered 1st food in very poor's country that have not enough food. 25 °C and 30 °C are suitable for rice germination. above or below this temperature effect crop production strongly. For agriculture, fresh water is getting harder to come by in Asia. Climate patterns have changed in recent years. So, set some rules of crop polices for profitable and better production to achieve sustainable goals in future. Also, good production ensures food security in a country or world (Cetin et al. 2019).

REVIEW OF LITERATURE

Greenhouse gases become the source of heat and temperature on earth. Due to greenhouse gases the sun rises never reflect back and penetrate into house. Due to the increase of the temperature of earth by many reasons the sea level. Disease of crops also rose, and pesticide used affected both crop and human health and environment. So, the government of every country must make eco-friendly practices of agriculture adopted that are beneficial for both environment, human health and vice versa. Through this we brained profit and sustainable agriculture (Fahad, et al 2019).

China has less chance of crop effected diseased raised through filed. Disease of crops also rose, and pesticide used affected both crop and human health and environment. So, the government of every country must make eco-friendly practices of agriculture adopted that are beneficial for both environment, human health and vice versa. trading policies and international rice cost might be affected on rice export and income ratio in Pakistan .Though this we brained profit and sustainable agriculture (Zhang et al., 2019) .

Rice production depends on climate and temperature. in future if climate and temperature zone is changing then automatically production ratio will also low and high. Water scarcity is also a major factor in coming years for humans, animals included marine animals and crop that edaphic qualities, sweet aroma, long grain size and good Basmati rice are much populist and people like to cook and eat (Akhtar, Haidar 2020).

Basmati rice is highly prized in globe some reason good taste, smell, aroma, long grain size. Super Basmati also famous and good in taste are useful. And Pakistan also export rice like super Basmati to foreigner countries. The rapid increase in population, cost of crops and economic growth, per capita income and other foods all influence the cost of rice (Maclean, Dawe, Hardy, and Hettel 2002).

To overcome Climate pattern, change in recent years. The crop rice accounts for nearly 80% of all irrigated freshwater resources. Various agricultural practices, including drying irrigation, non-flooded straw mulching cultivation, alternate wetting and post-a thesis-controlled soil drying, might be significantly improve water usage efficiency and maintain or even increase rice grain output. The alternating ways of soaking and drying might be a crucial tactic to lower water use and greenhouse gas emissions in rice farming. To overcome climate issues, the researchers set some standards and used alternative ways for more production in less water using technology (Livsey et al., 2019).

Toxic environment generated list of diseases that have strong impact on human beings, plants, and animals as well as. The rise of temperature also affects rice. Urbanization is the main factor that raised temperature in cities. Pollution and others environmental hazards are damaged. Pakistan also included world top ten countries that face all these issues (Cetin et al. 2019).

Governments of every country must make eco-friendly practices of agriculture adopted that is beneficial for both environment, human health and vice versa. Greenhouse gases become the source of heat and temperature on earth. Due to greenhouse gases the sun rises are never reflect back and penetrate into house (Fahad, et al. 2019).

METHODOLOGY

I have chosen the area Narowal. Narowal city is fall under Gujranwala division province of Punjab, Pakistan. Narowal area especially Hafiz Abad is famous for production of rice. Questionnaire method was used for data collection. Field notes and observation checklist were the tools that were used to collect data. The sample size was 40. Simple random sampling techniques (SRS) were used. All respondents were farmers. Statistical Package for the Social Sciences (SPSS) software was used for analysis of data.

RESULTS AND DISCUSSION

Data was collected in 3 weeks different 4 villages in district Narowal Punjab, Pakistan. I have generated all these figures and percenatge graphs through SPSS and Excel. The finding/results of my studeis are following:Farmers used new technology , new machines for more production. Technologies are reduced time and labour force. Through the use of Biotechnology: The Agricultural - scientist modified new crops with desirable traits and genes. Through Crop Monitoring and Management technologies like GPS framers easily monitor their crop health, growth and production rate. Technologies play vital role in farmer life because it consumes time and labor force also reduce environmental impact and increase the livelihoods of farmers through profitability in crops. Agriculture plays important role in farmers as well as country because agriculture is the backbone of Pakistan. Pakistan generates 25% agriculture sector generate 4.45% GDP**.** Impact of climate on rice production showed that 80% farmers agreed on this statement that climate has both positive and negative impact on crops.

Challenges that respondents have faced in rice production.50% farmers faced water scarcity problems.16% farmers faced pest diseased on their crop.3% farmers faced lack of technology during crop sowing and harvesting process. Government subsidies for farmers. 80% of farmers have no carry out any subsides. But 13% farmers took interest free loan for their crop and 6% farmers have taken subsides on seed for rice crop. Pakistan has included top ten countries that are good rice producers in the world.

Climate is most important for any crop. Climate change has a strong effect on rice. If we see international rice producers' countries. the 1st rice producer's country is China. China is the big rice producer's country in the whole world. After China India, Bangladesh, Indonesia, and the number 10th is Pakistan. If we see globally rice production, then we see China and India are the top two producers of rice in globe. India also cultivates various varieties of rice for consumer's preference. Asia region is the best producers of rice in the world. Pakistan earns lot of profit by export of basmati rice across the border.

Water Management:

Rice is a water-intensive crop, and in regions with limited water resources, farmers may face challenges in providing an adequate water supply. Due to seasonal and climate change the rain pattern total changed in Pakistan. Due to shortage of water farmers faced issues in their crop production. Rice is water containing crop. Without water, good production is not possible. Tubewell vital role to sort

out this problem. But inflation in Pakistan increased day by day and farmers faced difficulties to buy fuel. In Punjab the irrigation system is very good. But resources decreased day by day. Excessive water or poor drainage can lead to waterlogging and flooding, which can damage rice crops.

Pest and Disease Management:

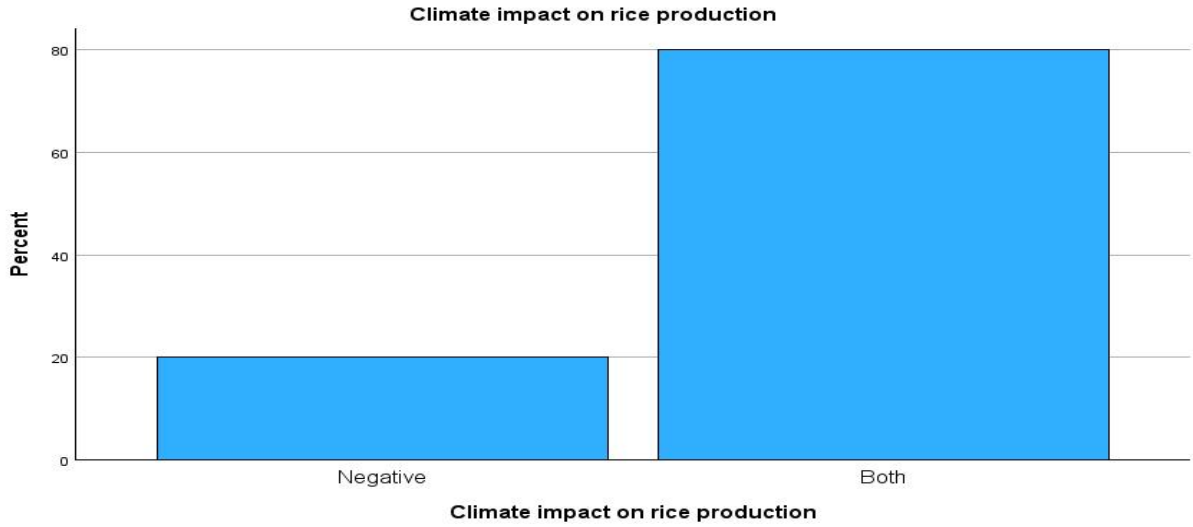
Rice plants are susceptible to various diseases, such as blast, sheath blight, and bacterial leaf blight, which can impact yield and quality. But it is not easy for farmers to buy these products. Sometimes farmers totally relied on nature. Pest damaged crop. And it affected the food security not for farmers but also country. Pest attack on crop and stop the growth. pesticides are very helpful against pests and also increased the production of crop.

Soil Health:

Weeds compete with rice plants for nutrients, water, and sunlight, reducing crop yield. Effective weed control is crucial for successful rice cultivation. Erosion can lead to loss of topsoil and nutrient runoff, affecting soil fertility and productivity. Farmers used fertilizers for more and good production. In fact, fertilizers are helpful, but it also has an impact on soil health and environment as well. Through rain fertilizers mixed water flow into rivers and it is toxic for marine species. Farmers should check the ph. of soil and then add products into soil according to need. But they don't this.

Climate Change:

Unpredictable rainfall patterns, droughts, or excessive rainfall can impact rice cultivation. Climate is very important for every crop. Floods occurred and it damaged the crop and human life vary badly. glaciers melt and their water becomes the source of flood. Smog has increased in Punjab especially in the area of Lahore that has toxic for human health. Climate has both positive and negative impact on crops. Seasonal change is short time, but climate change is long term, and it has strong impact on crop production.



Seed Quality and Availability:

Ensuring the availability of high-quality seeds is essential for a successful crop. Poor seed quality can lead to reduced germination rates and weaker plants. Migration of rural labor to urban areas can lead to a shortage of skilled farm labor during critical stages of rice cultivation. Rotation of crop in missing in Pakistan. Farmers are used to old traditional methods and do not easily adopt technology. Seed quality standards also disappeared. Availability of seed is for farmers, but they are not accepting. Farmers grow only some three to four regular crops.

Market fluctuations:

Farmers may face challenges related to fluctuating rice prices, affecting their income. Access to market: Limited access to markets can hinder farmers' ability to sell their produce at fair prices. Market access is also not available for farmers. They sell their crops at very low price. Because at that time they have need of money.

Research and Development

Precision Agriculture Utilize precision farming technologies, such as drones and satellite imagery, to optimize resource use and monitor crop health. For good production and to overcome hunger, the agriculture department should increase research and know the farmer's issues. Develop strategies to sort out all these issues. Pakistan has Rice Research Institute, Kala Shah Kaku (RRI): RRI is the primary research institute dedicated to rice in Pakistan.

- Rice Exporters Association of Pakistan (REAP)
- National Agriculture Research Centre (NARC) in Islamabad.
- University of Agriculture, Faisalabad (UAF).

Addressing these challenges often requires a combination of improved agricultural practices, technological advancements, research and development, and supportive policies from governments and agricultural institutions. Jaffer has been a pioneer in introducing new technologies in Pakistan in the agriculture sector and the most recent one is introduction of Mechanized Rice Sowing and Harvesting Machines for rice farmers.

CONCLUSION

The role of agriculture in farmer's life not as source of food but it also sources of income, preserving cultural practices, rural development, preserving natural environment, indigenous culture and food security. Agriculture also runs the food chain and maintains the natural environment. Various types of rice are cultivated: Basmati 370, Basmati 385, Super Kernel, Super Basmati, Super fan, Kainaat, Sela, Satho.farmers used these fertilizers in much time for their crops including rice DAP (Diammonium phosphate), Urea , Nitrogen (N), Phosphorus (P), Potassium (K), Zinc Sulphate. Pest Attack on Rice also much strong . Some of these insects damage rice crop e.g. Armyworms, Green plant Hopper, Rice Hispa, Stem Borer , Brown plant Hopper, Rice leaf roler. About half of the population depends on rice

Water Management very important for rice and every crop .In 2025 the irrigated rice fields might be suffered from water scarcity issue. Improved Varieties: Plant high-yielding and disease-resistant rice varieties to enhance overall productivity. Choose varieties that are well-adapted to local soil and climatic conditions.

Climate Change: Extreme temperatures, both high and low, can affect rice growth and yield. Unpredictable rainfall patterns, droughts, or excessive rainfall can impact rice cultivation. Seed Quality and Availability Ensuring the availability of high-quality seeds is essential for a successful crop. Poor seed quality can lead to reduced germination rates and weaker plants. Selecting rice varieties that are well-adapted to local conditions is crucial for optimal yield. Nutrient Management: Conduct soil tests to determine nutrient deficiencies and apply fertilizers accordingly.

So, at the end government should provide subsides to farmers that helpful for farmers to do agriculture in more techniqical ways that make sure more production in less time and also less water. Rice is major source of food for Pakistan and sustainable rice production is important to meet the world's expanding demand for this staple commodity to reducing environmental effect and increase the effective and adorable use of technology.

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