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Rural realities: Investigating the multi-faceted problems confronting sugarcane farmers

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Abstract

The agricultural sector, particularly sugarcane cultivation, serves as a linchpin of Uttar Pradesh's economy. However, despite its prominence, sugarcane farmers in this region face a gamut of challenges undermining their productivity and socio-economic well-being. This research delves into the multifaceted issues confronted by these farmers and endeavors to explore viable strategies to ameliorate their predicaments.

The objectives encompass identifying and scrutinizing the prevalent challenges impacting sugarcane farming, assessing their socio-economic ramifications, and delineating potential policy interventions. Employing qualitative methods, the study embraced purposive sampling, targeting experts and stakeholders to garner comprehensive insights through interviews, surveys, and observations.

The findings underscore several critical challenges. The lack of irrigation infrastructure emerged prominently, with Uttar Pradesh grappling with deficient access to water resources, Consequently, sugarcane farmers contend with diminished crop yields, poor quality produce, and heightened vulnerability to pests and diseases. Furthermore, the unavailability of improved sugarcane varieties and Inadequate extension services add complexity to the scenario. Addressing these predicaments necessitates a multifaceted approach. Proposed solutions encompass modernizing irrigation infrastructure, facilitating affordable seed access, augmenting extension services through training and collaborations, streamlining administrative processes, and advocating for the rights of sharecroppers.

This study advocates for holistic interventions, inclusive policy frameworks, and community participation to foster a sustainable, equitable, and technologically adept sugarcane farming landscape in Uttar Pradesh. Realizing these recommendations demands concerted efforts from policymakers, stakeholders, and the agricultural community at large.

Keywords: Irrigation infrastructure, seed access, extension services, agricultural mechanization and sharecroppers' rights

1. Introduction

The agricultural sector forms the backbone of economies in many developing countries, including India. In the Indian state of Uttar Pradesh, sugarcane cultivation plays a vital role, both in terms of economic contribution and livelihood sustenance. However, despite its significance, sugarcane farmers in Uttar Pradesh encounter a multitude of challenges that hinder their productivity, profitability, and overall well-being. This research paper aims to shed light on the problems faced by sugarcane farmers in Uttar Pradesh and explore potential strategies for addressing these issues.

Objectives

This research paper aims to achieve the following objectives:

A. To identify and analyze the key challenges faced by sugarcane farmers in Uttar Pradesh.
B. To examine the socio-economic impact of these challenges on the livelihoods of farmers.
C. To explore potential strategies and policy interventions for mitigating the problems faced by sugarcane farmers.
D. To contribute to the existing knowledge base and generate insights that can inform policymakers, agricultural organizations, and stakeholders in their efforts to support sugarcane farmers.

Methodology

To create a methodology for a research paper involves outlining the approach, methods and techniques used to gather and analyze data. Here is the structure of methodology, which we followed for research.

Research design: In this study we used qualitative methods because it provides rich, contextual insights.

Sampling: We chose the participants purposely because we needed sugarcane farmers for this study and we selected participants who were experts in a particular field or possessed specialized knowledge relevant to the study. This helps in gathering in-depth insights or perspectives.

Data collection: We used interviews, surveys and observations for data collection.

Analysis: We used a qualitative analysis method for a systematic examination and interpretation of gathered information.

Findings

Lack of irrigation

Uttar Pradesh is a major sugarcane producing state in India,

but it also faces a major challenge of lack of irrigation. According to the 2019-2020 agricultural census, only 59.2% of the total cropped area in the state is irrigated. This is significantly lower than the national average of 68.2%. In 2023 most farmers still depend on natural water resources, which is an issue.

There is a lot of problem with irrigation in the sugarcane dominated areas of Uttar Pradesh, due to being situated in the semi-arid region, there is less rainfall compared to other areas and the irrigation infrastructure of the state is very old which needs repair for a long time. Sugarcane farmers are still dependent on this old system. The situation is so poor that many farmers are still without their own irrigation system.

Many schemes are being run by the Government of India to deal with the problem of irrigation, out of which the scheme of Drip Irrigation is very important, but the sugarcane farmers could not get the full benefit of this scheme. This scheme is also limited to achieving the targets of government departments and personal profit of the dealers.

Lack of electricity is also the reason for the problem of irrigation. Most of the sugarcane farmers depend on electric tube wells, but due to high consumption of electricity in summer, electricity is not available even for irrigation in the villages and this continues for many days. that is not good for the quality of the sugarcane crop.

The Uttar Pradesh government has taken some steps to address the lack of irrigation. In recent years, the government has invested in a number of irrigation projects, including the construction of new canals and reservoirs. The government has also provided subsidies to farmers who install irrigation systems on their own. However, more needs to be done to address this issue.

This is how lack of irrigation can affect sugarcane crop.

- **Reduced crop yield:** Sugarcane plants that do not receive enough water will grow slowly and produce fewer stalks.
- **Shorter stalks:** When sugarcane plants are under water stress, they will produce shorter stalks.
- **Poor quality sugarcane:** Sugarcane that is not properly irrigated will have a lower sugar content and be more difficult to process.
- **Increased susceptibility to pests and diseases:** Sugarcane plants that are under water stress are more susceptible to pests and diseases.
- **Death of plants:** If sugarcane plants do not receive enough water for an extended period of time, they will eventually die.

We can easily assume that with lack of irrigation, the economical condition of sugarcane farmers can be distressed.

Non availability of improved/desired varieties

Improved seeds are those that have been bred to be more resistant to pests and diseases, produce higher yields, and mature faster than traditional varieties. They can play a significant role in increasing crop productivity and farm incomes, especially in rural areas where farmers often have limited access to resources.

However, there are a number of factors that can contribute to the lack of improved sugarcane varieties in rural areas. These include:

1) **High cost:** Sugarcane seeds have always been made available to the farmers by research institutions in weight, the price of which used to be around ₹ 450 per quintal, but currently a new method has been developed by the institutions in which sugarcane seed price depends on the basis of number of eyes or buds present in sugarcane. The price of one bud has been fixed at ₹ 1.30 to ₹ 1.60 by research institutions, now we will understand this business mathematics in simple words.

Land area	Required Seed	Cost	Total Cost	Method
1 bigha	5 quintal	450/qui.	2250	Traditional/Old
1 bigha	2500-3000	1.3-1.6 ru./bud	3250-4800	Trench

*labor cost is not included.

From the above table, we can easily understand how much the adoption of new varieties is costing the farmers at present. Research institutes and farms are selling seeds with the budding method, but here is the problem with this method. They don't provide treated buds, they only provide sugarcane, which adds extra labor cost for farmers, this is like giving potatoes by saying chips. Government institutes are doing their best to cut the cost but it is very hard to provide 'good for cheap' these days and research institutes should understand that their aim is to provide cheap and good seeds to the farmers and not to set up a business model.

2) **Inaccessibility:** Rural areas have to wait a long time for new species. It is often seen that improved/new species get distributed around research institutes/research farms and it takes a long time for them to reach remote areas. Besides, some farmers also become victims of misinformation. Sugarcane councils, sugarcane societies and cooperative sugar mills purchase seeds in large quantities and make them available to the farmers, in which the farmers do not have to pay for transportation. Even in such a situation, seeds can be made available only at one place in the district. Because it is not possible to take transport everywhere. Due to the lack of tractor trolleys, some farmers are also deprived of adopting new varieties.

3) **Lack of awareness:** Laggardness is a problem of our farmer brothers and sugarcane farmers are not untouched by it. The basic quota of farmers is increased by the department if the seeds of the research institute/authorized farms are taken through the District Sugarcane Council and there is also a provision of grant for setting up a nursery. Even after this, farmers are not able to take full advantage of the new variety. For example, in the greed of cheapness, farmers buy seeds from sugar mills, from different farmers or through other means, on which they do not get the benefit of any kind of grant and increment in basic quota. There was a problem of red rot in sugarcane in the year 2021-22, but some districts of Uttar Pradesh have completely ignored this epidemic and are still adopting CO-238 variety, which shows lack of awareness.

Inadequate extension services

In Uttar Pradesh, two people are responsible for the promotion of sugarcane cultivation, first is the field staff of a government organization and the second is field staff of a sugar mill. First let us talk about the government employees, the session 2023-24 is going on and the world has moved from petrol-diesel to electric but still the government field staff is being given a bicycle allowance of ₹ 200 per month and in this ₹ 200 they have to take care of 800 to 2000 hectares of sugarcane area per month, do sugarcane survey work, conduct displays, do membership certification and when time permits, medicines and fertilizers also have to be distributed, the work of extension gets lost somewhere in all these activities.

Now comes the turn of sugar mill staff, most of sugar mills prefer local employee because:

- Lower hiring costs and cost-effectiveness
- Better understanding of the local market, laws and culture
- Stronger ties to the community
- Pre-established network

But there is a downfall with this local hiring-

1. **Very limited talent pool:** Depending on the location, there might be a limited number of qualified candidates for specific roles, it affects introduction of new technology & variety.
2. **Limited Cultural Perspectives:** Relying solely on local hiring may limit exposure to different cultures and ideas, it doesn't help farmers nor sugar mills because it discourages the adoption.
3. **Conflict:** Because 'Sugar Industry & Cane Development Department' has 'no locals' policies for their field staff which is just opposite of sugar mills policy which generates a cold wall between these employees.
4. **Low interest:** most local employees took field jobs as a side hustle, so they never give their hundred percent.
5. **Lack of training:** Various training programs are organized by the Sugar department/Research institutes from time to time, which benefit both farmers and employees. But no such work is done by the sugar mills, hence lack of training is seen among the sugar mill employees.

During the study we found that sugar mills put their benefits first, so they share limited knowledge and information with farmers, for example: sugar mill employees promoting CO-15023 variety for its recovery and weight without telling about its softness.

Mis-management

In any business or farming, mismanagement is a big problem for every sector and sugarcane farming is also not deprived of it. We can understand the mismanagement of sugarcane farming according to their source:

Timing: February to March is the right time for sowing sugarcane in spring and at this time an abundant amount of seeds is available in research institutes, which ends by April-May. Due to this, many farmers who wait to sow sugarcane after harvesting the wheat crop are deprived of the seeds of new and improved varieties of sugarcane.

Departmental: Although the sugarcane department tries to take care of the interests of all the farmers, just as everyone cannot be made happy in a democracy, similarly not every decision taken by the department can benefit every farmer. This is how we can understand it:

- The department is often unable to provide timely payment of sugarcane price to the farmers.
- Small farmers often do not receive supply slips in time.
- Decisions often get delayed due to various paperwork, for example: The sugarcane variety which should be early to general or rejected before the survey is amended at the time of running of the sugar mill, which creates confusion among the farmers.

Sugar-mills: Sugar mills play the role of backbone in sugarcane agriculture and even a little flexibility in them can create problems for the farmers. which are as follows:

- Errors in surveys: such as survey in wrong name, species being entered wrongly and survey being missed etc.
- Lack of interest in agricultural extension work
- Nonpayment of sugarcane price on time

Farmers: If sugarcane farming is an ecosystem, then the farmer is its biological component. During the study, it was found that most of the problems occurring in sugarcane farming arise due to lack of awareness on the part of the farmer, for example:

- **Varieties:** Despite the huge efforts made by the department to deal with the problem of red rot, farmers neglected to adopt new varieties and due to the adoption of CO-238 variety, they faced losses in the year 2023.
- **Fertilizers & insecticide/pesticide:** Like the above, the same is seen with new fertilizers and insecticide, like instead of granular urea, liquid urea is being made available to the farmers at reasonable prices, but still the farmers are not able to give up the attraction of granular urea. Even in case of pesticides, our farmer brothers remain dependent on one medicine, due to which soil fertility has to bear the brunt.
- **Irrigation:** The problem is the same with the means of irrigation, despite 80 to 90 percent subsidy, drip irrigation is being adopted by the farmers at a very slow pace.
- **Sugarcane supply system:** Sugarcane committees and sugarcane councils try to ensure easy supply of sugarcane, but farmers are less aware of how accountable they are to the farmers, we can understand it this way: The higher of the average of sugarcane supply of 2, 3 and 5 years is the basic quota of the farmer. If the farmer supplies sugarcane as per the prescribed basic quota every year, then his basic quota remains normal. Now farmers often complain about receiving less supply slips despite sowing more sugarcane. This happens only with those farmers who have supplied a lot of sugarcane in some years and negligible supplies in other years. Sugarcane farmers who do not cultivate ratoon and plants in the ratio of 60 and 40 also do not receive their slips within the stipulated time.

- **Survey:** The most problems among sugarcane farmers occur due to irregularities in sugarcane survey, such as survey on wrong species and wrong name and omission of survey. These errors often arise due to the farmer himself not being present in the field during the survey.

Agriculture mechanization

Agriculture mechanization offers numerous benefits, but it also presents challenges that need to be addressed for its effective implementation:

1. **High Initial Investment:** Purchasing machinery, equipment, and technology for mechanization can be expensive. For small-scale farmers or those in developing regions like Uttar Pradesh, the initial investment cost might be prohibitive, leading to limited adoption.
2. **Access and Affordability:** Accessibility to modern machinery and technology might be limited in rural or remote areas. Additionally, the ongoing maintenance, repair, and operational costs could be a burden for farmers with limited resources.
3. **Training and Skill Gap:** Operating complex machinery often requires specialized skills and training. Lack of proper training programs or educational resources might lead to improper use of equipment, reducing efficiency and increasing the risk of accidents.
4. **Compatibility with Farm Size and Terrain:** Some machinery might not be suitable for small or irregularly shaped farms or for areas with challenging terrain. Large-scale machinery might not be efficient or feasible in smaller plots of land, limiting their applicability.
5. **Environmental Impact:** Intensive mechanization, especially when coupled with inappropriate land management practices, can have adverse environmental effects such as soil compaction, loss of biodiversity, and increased energy consumption.
6. **Dependency on Technology and Inputs:** Heavy reliance on machinery and technology can lead to dependency on specific inputs, such as fossil fuels, which can be subject to price fluctuations or supply chain disruptions.
7. **Social Impact:** Increased mechanization might lead to reduced demand for labor in agriculture, potentially causing unemployment or the migration of laborers from rural to urban areas. This could impact local economies and social structures.
8. **Adaptation and Maintenance:** Farmers might face challenges in adapting to new technology or machinery due to cultural or traditional farming practices. Additionally, access to maintenance services or spare parts could be limited in some regions, affecting the sustainability of mechanization.
9. **Risk Management:** Breakdowns or malfunctions of machinery during critical periods, such as planting or harvesting, can pose significant risks to farm operations and productivity.
10. **Government support:** ‘Pahle aao pahle pao’, lottery system and etc. are the government ways to provide subsidies to the farmers which are unable to follow equity and equality completely.

Other issues

During the study with the help of farmers, sugar mill employees, Government employees and extension experts we observed various issues and most of them we discussed above, but we also found some other issues which are indirectly responsible for sugarcane production, adoption and extension.

Batai system: Uttar Pradesh is the largest state in the country and agriculture is the major enterprise here, as about 68% of the population is dependent on agriculture and 25% of the total agricultural land comes under share cropping. There is no rule sharing system in sugarcane agriculture, only those who have their own land are considered as sugarcane farmers and only those farmers who have cultivable land get the benefits of all the schemes and rules of the sugarcane department. Due to this, the sharecroppers have to depend on the land owners and this often leads to exploitation and dissatisfaction. At present there is no law to protect the rights of sharecroppers.

Failure of government schemes: Many schemes are being run by the government to benefit the sugar farmers, but this is the problem here. upagriculture.com is the portal through which farmers of the state get acquainted with the schemes run by the state government. But this portal has become more complex with time, the schemes of the sugarcane department are lost on this portal. During the study, the sugarcane farmers faced the following problems in availing the benefits of the departmental schemes-

- wrong farmer’s registration no.
- forgotten registration no.
- wrong ADHAR no. (which act as password)
- wrong bank account/ IFSC code

and not a single way to correct all of them.

Stray and wild animals: In Uttar-Pradesh stray cows and cattle are a big problem for every crop. In the case of sugarcane, wild boar, monkeys and cows are primary foes. Boars are aggressive animals they even attack on humans. In sugarcane farms they attack on roots to eat white grub, in this process they damage stem, leaves and roots. Similar damage is done by cows and monkeys for food.

Solution and suggestion

Addressing the myriad challenges in Uttar Pradesh's sugarcane farming requires a multifaceted approach. Here are some potential solutions:

Lack of Irrigation

Modernization of Irrigation Infrastructure: Invest in upgrading and repairing existing irrigation systems and introduce more efficient methods like drip irrigation, supported by government subsidies and technical assistance. Promotion of Alternative Irrigation Methods: Encourage rainwater harvesting, small-scale water storage solutions, and promote water-saving techniques like mulching to optimize water use in sugarcane fields.

Electricity Accessibility: Enhance electricity supply during peak seasons by implementing better grid management

strategies or exploring alternative energy sources for powering irrigation systems.

Unavailability of Improved Sugarcane Varieties

1. **Affordable Access to Quality Seeds:** Collaborate with research institutions to subsidize costs for farmers accessing improved seeds. Ensure transparency in pricing and distribution to minimize financial burdens.
2. **Timely Distribution:** Establish efficient distribution networks to swiftly disseminate new varieties to remote areas, involving cooperatives, sugarcane societies, and leveraging existing agricultural extension services.
3. **Enhanced Awareness Campaigns:** Conduct awareness programs, workshops, and farmer-centric education initiatives to familiarize them with the benefits and techniques of adopting improved sugarcane varieties.

Inadequate Extension Services

1. **Training and Capacity Building:** Organize regular training programs for both government field staff and sugar mill employees, focusing on modern agricultural practices, new technologies, and effective communication skills.
2. **Collaborative Knowledge Sharing:** Foster collaborations between government agencies, research institutions, sugar mills, and local bodies to facilitate the exchange of information and best practices directly with farmers.
3. **Incentivize Information Dissemination:** Encourage sugar mills and field staff to share unbiased and comprehensive information on seed varieties, farming techniques, and best practices with farmers through incentives or rewards.

Mismanagement Issues

Streamlined Administrative Processes: Simplify paperwork and administrative procedures related to sugarcane farming, ensuring timely payments, accurate surveys, and transparent supply chain management.

Support for Sharecroppers: Introduce policies safeguarding the rights of sharecroppers, ensuring fair treatment and access to benefits, irrespective of land ownership.

Enhanced Government Scheme Accessibility: Revamp digital platforms, like upagriculture.com, to be more user-friendly, facilitating easy registration, correction of details, and comprehensive access to scheme benefits.

Agriculture Mechanisation

Addressing these challenges requires holistic approaches that consider the socio-economic, environmental, and technological aspects of agriculture. It involves providing access to appropriate and affordable machinery, offering training and support programs, promoting sustainable practices, and ensuring that mechanization aligns with the specific needs and contexts of different farming communities.

Overall Improvement Strategies

1. **Public-Private Partnerships:** Foster collaborations between public and private sectors to bridge gaps in resources, technology, and knowledge dissemination, ensuring a more holistic approach to problem-solving.
2. **Research and Development Funding:** Allocate resources towards ongoing agricultural research to develop drought-resistant varieties, efficient irrigation systems, and sustainable farming practices.
3. **Community Engagement and Participation:** Encourage active involvement of local communities, farmer cooperatives, and stakeholders in decision-making processes, ensuring solutions align with on-ground realities and needs.

Implementing these solutions will require concerted efforts from policymakers, agricultural experts, farmers, and stakeholders, aiming for a sustainable, technologically advanced, and socially equitable sugarcane farming landscape in Uttar Pradesh.

Conclusion

In Uttar Pradesh, the cornerstone of agricultural sustenance, particularly in sugarcane cultivation, faces an intricate web of challenges stemming from inadequate irrigation facilities, unavailability of improved varieties, and systemic mismanagement. The dearth of irrigation infrastructure in semi-arid regions significantly hampers the potential of sugarcane cultivation, as most farmers still rely on archaic systems, leading to reduced yields, poor quality produce, and increased vulnerability to pests and diseases.

The struggle to access improved sugarcane varieties exacerbates the situation. Factors such as high costs, inaccessibility in remote areas, lack of awareness, and mismatches in timing inhibit farmers from benefiting from advanced seed varieties. The pricing structure and distribution logistics often burden farmers, highlighting the disparity between research institutions' goals and farmers' needs.

Moreover, inadequate extension services further compound these issues. While efforts are made by government agencies and sugar mills, the limited talent pool, conflicting policies, lack of training, and vested interests hinder effective knowledge dissemination. This results in a lack of crucial information reaching farmers, impacting their decision-making and overall productivity.

Mismanagement, whether in timing, administrative decisions, or farmers' practices, amplifies the challenges. Delayed payments, errors in surveys, and insufficient accountability in the supply chain create further obstacles. The situation is exacerbated by the lack of protective measures for sharecroppers and the failure of government schemes due to cumbersome administrative processes.

The cumulative effect of these multifaceted challenges not only affects the agricultural yield and quality but also impacts the socioeconomic conditions of sugarcane farmers. To achieve sustainable and thriving sugarcane cultivation in Uttar Pradesh, a holistic approach is imperative, one that addresses infrastructural gaps, streamlines distribution systems, enhances extension services, and fosters collaborative efforts among stakeholders. Only through concerted actions and policy reforms can the plight of sugarcane farmers be alleviated, ensuring a resilient and prosperous agricultural sector in the state.

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