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FEASIBILITY STUDY OF ENHANCING AGRICULTURAL PRODUCTIVITY IN KANDHAR BLOCK OF NANDED DISTRICT, MAHARASHTRA

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ABSTRACT

Shekapur village in the Marathwada region of Maharashtra is predominantly an agricultural community with more than 90% of the land (over 500 acres) dedicated to cultivation. The village, surrounded by hilly terrain and situated next to the Manyad river, faces challenges such as limited access to nearby markets for crops like Sugarcane and Turmeric, as well as a lack of modern machinery. The majority of farmers are aged between 50 and 60 and rely on traditional farming methods. Intercropping is common among small and marginal farmers to maximize production on limited land. There is a need for advanced machinery to increase productivity. Groundwater depletion is a future concern as more than 50% of farmers rely on borewells for irrigation. Lack of awareness about government support schemes, market information, and workshops hinders the farmers' access to resources and knowledge. Livestock rearing is practiced as an allied activity, with buffaloes being the dominant livestock due to two local dairies. The availability of agricultural labor has reduced, and the majority of farmers have loans from the State Bank of India. Overall, the agriculture productivity of the village is moderate, and farmers believe it will take another 10 to 20 years to achieve the level of modern agriculture seen in Western Maharashtra.

KEY WORDS: *Shekapur, Marathwada, Maharashtra, Agriculture, Cultivation, Crop diversity, Machinery, Water availability, Livestock rearing, Agricultural labor*

INTRODUCTION

India, as a developing country, heavily relies on agriculture, which serves as the backbone of its economy. With approximately 60% of the population directly dependent on agriculture, it plays a crucial role in providing employment opportunities to half of the country's inhabitants. The agricultural sector contributes 18% to India's GDP and excels in the production of various crops such as pulses, rice, wheat, spices, fruits, sugarcane, and cotton. Maharashtra, the second most populous state, possesses a vast rain-fed cultivation area of 33,500 square kilometers. However, the state faces the challenge of 24% of its regions being affected by drought. Nanded, located in the Marathwada region of Maharashtra, occupies the southeastern part of the state. With a total area of 10,528 square kilometers, Nanded is home to a population of approximately 112 million. Agriculture serves as the primary occupation for the majority of the population, providing employment to around 85% of the people. The district predominantly cultivates kharif crops such as cotton, jowar, rice, tur, mung, and urid. Banana cultivation is also renowned in Nanded's horticulture sector. However, Kandhar, a block within the Nanded district, faces low agricultural productivity due to undulated land caused by surrounding hilly areas and the absence of proper irrigation systems, despite having access to the Manyad river. The livelihoods of the rural population in India, particularly small and marginal farmers who constitute about 85% of cultivators, face challenges related to declining profitability and increasing risks in agriculture. These vulnerabilities arise from factors such as limited scale of operation, lack of information, poor access to credit, weak market participation, and exploitation by intermediaries. Although agricultural cooperatives have long been the dominant form of farmer collectives, they have limitations, except for a few successful exceptions in dairy farming. In recent years, the formation of producer organizations has emerged as an effective approach to address the challenges faced by small and marginal farmers. Considering the importance of agriculture in the Kandhar block of Nanded district, Maharashtra, a study has been conducted with specific objectives. Firstly, the study aims to examine the existing agricultural practices and productivity in the selected panchayat. It will analyze factors such as cropping patterns, irrigation methods, technology adoption, and overall farming efficiency. Secondly, the research seeks to identify the risks, challenges, and market patterns in agricultural production. This includes assessing the impact of weather conditions, market fluctuations, pest infestations, and market accessibility on farmers. Thirdly, the study aims to explore existing and new techniques that can enhance agricultural productivity in the Kandhar block. This may involve promoting innovative irrigation methods, utilizing advanced farming technologies, improving soil health, and adopting sustainable practices. Lastly, based on the findings, an integrated plan will be developed to improve the agricultural pattern in the Kandhar block. This may include capacity-building programs, improved

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access to credit and markets, infrastructure development, and knowledge-sharing platforms. Overall, the study aims to contribute to the sustainable development of agriculture in the Kandhar block of Nanded district. By addressing the objectives, it seeks to provide valuable insights and recommendations that can help farmers enhance productivity, reduce risks, and improve their livelihoods. The ultimate goal is to foster a thriving agricultural sector in the region, benefiting not only the farmers but also contributing to the economic growth and food security of Maharashtra and India as a whole.

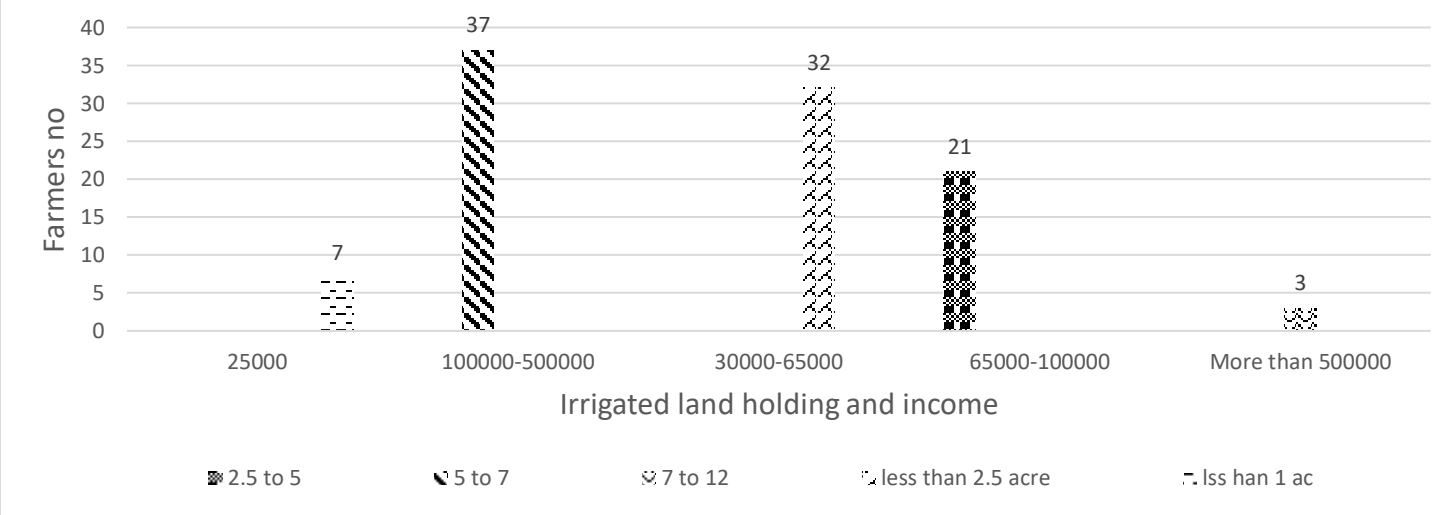
STUDY AREA AND METHODOLOGY

In the research study conducted in the Kandhar block of Nanded district in Maharashtra, a specific village called Shekapur Panchayat was chosen for investigation. The study period spanned from May 27, 2022, to July 12, 2022. The research design encompasses the overall strategy of the study, including the various components and the definition of research problems. The study employed different types of research designs such as qualitative and quantitative approaches (including surveys and case studies), experimental methods, literature reviews, and techniques like Focus Group Discussions (FGD) and Participatory Rural Appraisal (PRA) to address the research questions. The selection of the village for the study was purposive, while the respondents were chosen using the Stratified Random Sampling method. 100 farmers were selected as respondent.

RESULT AND DISCUSSION

Below are the results inferred from 100 sample survey. It is covering different factors responsible for agriculture productivity.

Land Holding and Income



Income is directly linked to the amount of irrigated land, as agriculture is the primary source of livelihood. Farmers with less than 1 acre of land earn up to Rs 25,000 annually. Over 50% of farmers earn up to Rs 100,000 with land up to 5 acres. 37% earn between Rs 100,000 and Rs 500,000 with land up to 5 acres. Only 3% of farmers own more than 7 acres and earn over Rs 500,000. The maximum landholding per farmer is 12 acres. Limited irrigated land results in lower production. Marginal farmers cultivate traditional crops like soybean and cotton due to lack of capital, while wealthier farmers focus on cash crops like sugarcane and turmeric. Marginal landholders rely mostly on traditional farming methods.

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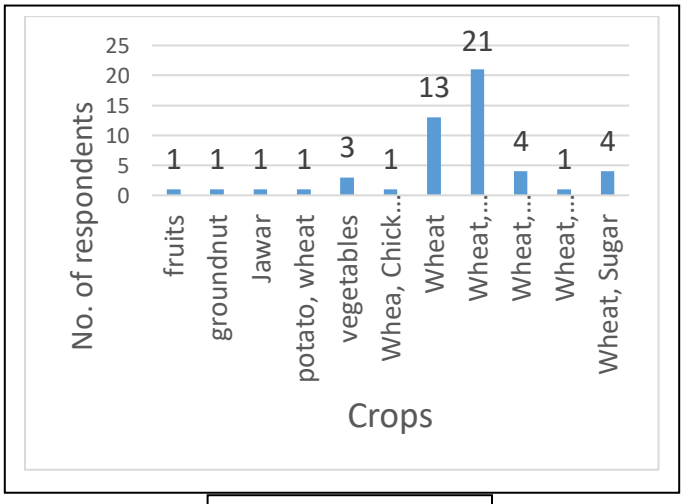
Changing trend of agriculture

Parameters	1970-80	1980-90	1990-2000	2000-2010	2010-2020
Rainfall	Drought	90%	50%	Drought	Drought+ heavy rain
Crops	Piwala, Groundnut, Moong	Zingari, White Tur, cotton,	Cotton, Chick pea, Groundnut, Til	Soyabean, vegetables.	Sugarcane, Turmeric, Fruits
Water Sources	Well, Rainwater	Well, River, Rainwater	Rainwater, well	Well, Borewells	Rainwater, River, Borewells
Irrigation system	Moat	Farrow system	Motor pump, open flood	Drip	Sprinkler
Fertilizers	Organic	Organic	Organic+ inorganic	Organic+ inorganic	Organic+ inorganic
Crop diseases	Unaware	Unaware	Aware- Boll worm, Root rot	45%	25%
Labor Availability	80%	80%	80%	35%	35%
Migration	20%-Agriculture work	20%-Agriculture work	20%-Agriculture work, Kiln making	40% Agriculture work, Kiln making, Education	45% Agriculture work, Kiln making, Education

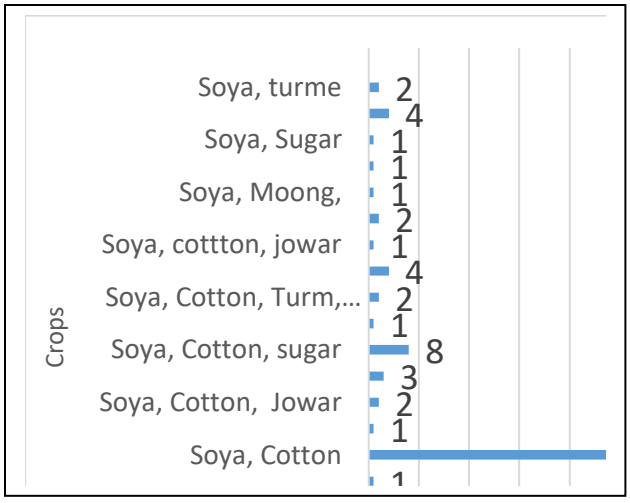
Over the years, the region experienced fluctuations in rainfall patterns. The 1970s-80s were marked by drought conditions, with limited rainfall of 90%, resulting in crops like Piwala, Groundnut, and Moong. Water sources relied on wells and rainwater, while a moat system facilitated irrigation. Organic fertilizers were commonly used, but there was limited awareness of crop diseases. Labor availability remained steady at 80%, with a portion of the population migrating for agricultural work. Throughout subsequent decades, rainfall and crop patterns varied, with periods of drought, improved rainfall, and a combination of both. Different crops were cultivated, water sources expanded, irrigation systems evolved, and fertilizers were used. Labor availability and migration patterns also changed over time.

Cropping Pattern

Among the 100 farmers surveyed, 76 of them engage in intercropping while only 24 practice monocropping. The prevalence of intercropping can be attributed to the fact that the majority of farmers in the village are small and marginal, opting to cultivate two crops on the same land. Specifically, they intercrop tur, moong, and groundnut. In contrast, farmers with larger landholdings prefer monocropping as they focus on large-scale production and perceive intercropping as a potential disruption to their crops. Therefore, small and marginal farmers play a significant role in cultivating tur and moong.



Type of Rabi crops



Type of Kharif crops

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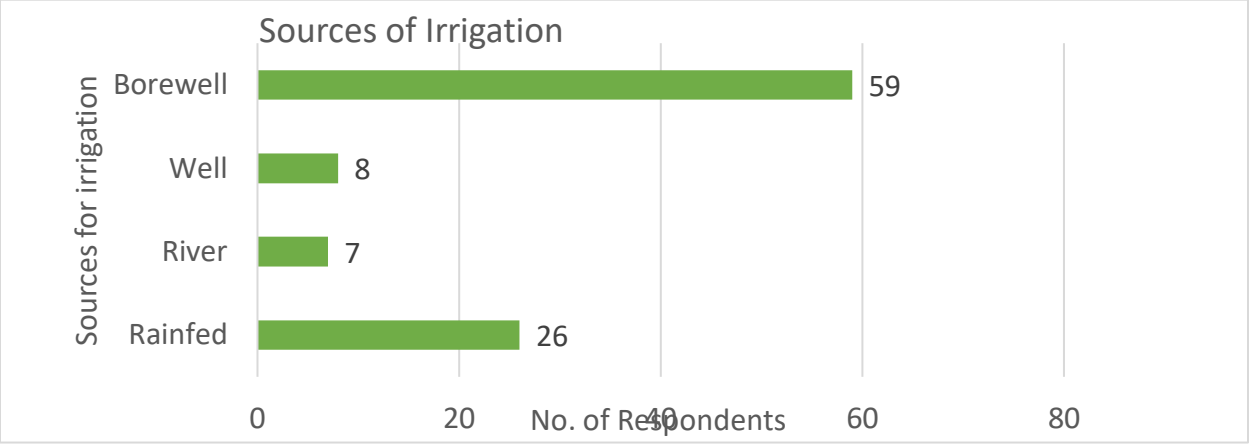
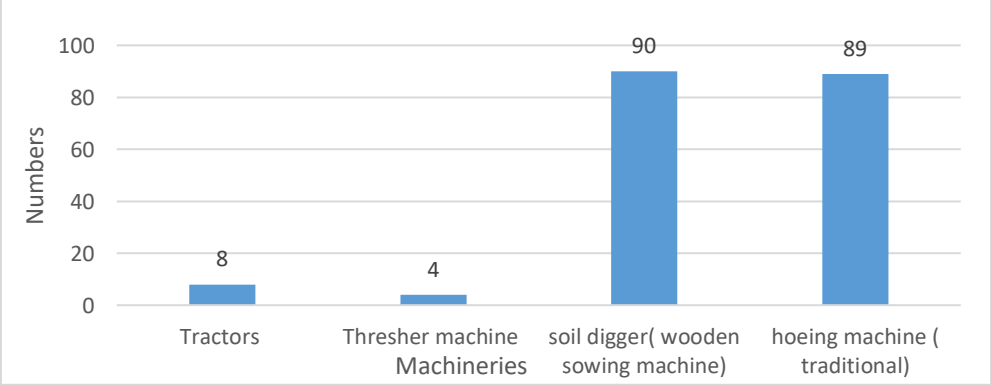
All the farmers in the village cultivate Kharif crops, and out of the 100 samples, 51 also cultivate rabi crops. Those with sufficient water availability and larger landholdings engage in both seasons of farming. In the Kharif season, all 100 farmers grow cotton, while only 4 do not cultivate soybeans. Some farmers also cultivate sugarcane and turmeric, although the limited market access in Ardhapur and Nijamabad, which are located 80 and 130 km away, respectively, poses challenges due to high transportation costs. Additionally, the farms are accessible only via dirt roads, making it difficult for large transportation vehicles to enter. During the rabi season, wheat production is prominent, and some farmers also grow groundnuts and chickpeas alongside wheat.

Irrigation



A majority of the farmers, over 50%, rely on borewells as their primary source of irrigation. Around 26% of the population depends solely on rainfed agriculture. Only a small percentage, 7 individuals, who own land near a river, utilize electric motors in the river for irrigation purposes. The excessive use of borewells poses a threat to the village's future, as it can lead to a decline in groundwater levels. Moreover, farmers do not receive any subsidies for adopting advanced irrigation techniques. Some individuals resort to borrowing from moneylenders to fund the construction of borewells. Given this data, it is evident that the village requires a comprehensive plan for water harvesting and conservation to address these challenges effectively.

Agriculture Machinaries



The villagers in this community lack knowledge about advanced agricultural machinery. With a total of 507 farmers in the village, there are only 8 tractors available, resulting in a significant gap in modern agricultural techniques. On average, each tractor is shared among 63 farmers for their cultivation needs, highlighting the scarcity of machinery. As a result, most farmers still rely on traditional agricultural instruments like wooden sowing machines and hoes. During a Focus Group Discussion (FGD), farmers expressed several reasons for this reliance. The high cost of machinery makes it unaffordable for them, and the village is not covered under the POCRA scheme, which provides subsidies for agricultural equipment. Additionally, farmers are unaware of the MAHA-DBT scheme. Renting machinery is also financially burdensome, and the limited availability of machinery restricts their reliance on it. Furthermore, the village lacks

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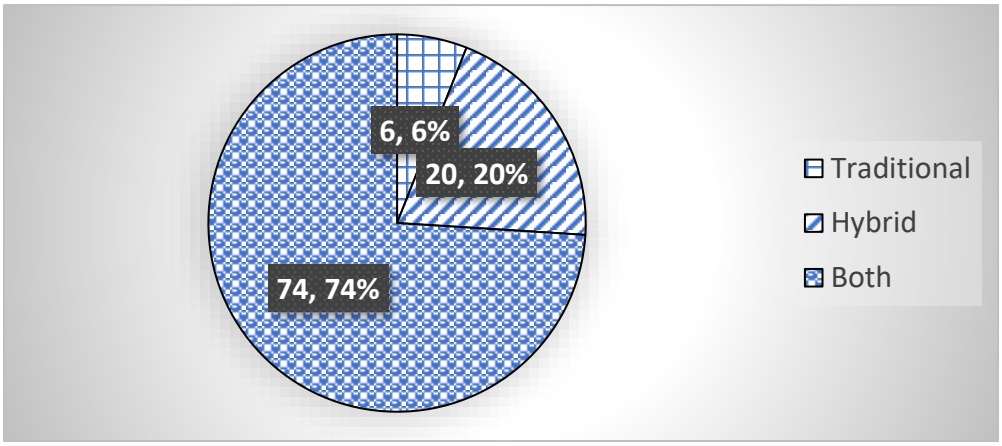
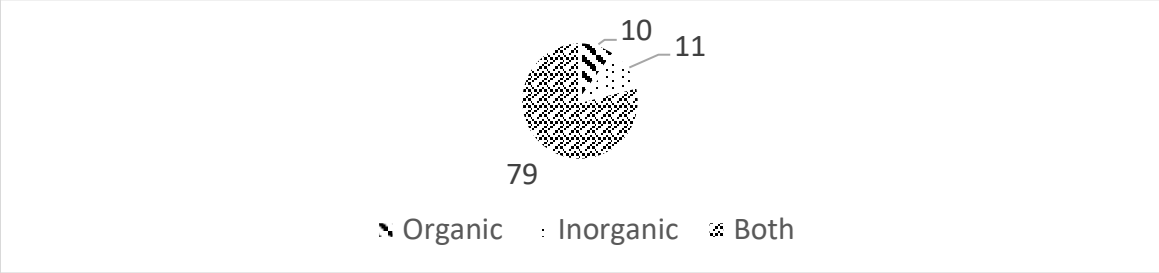
proper road infrastructure, preventing the entry of advanced machinery. There is no custom hiring center in the Kandhar block, exacerbating the situation. Although traditional instruments are less efficient, farmers are more comfortable using them. Some farmers have individually applied for machinery through the Panchayat but have not received any response. Farmers expressed their interest in adopting modern agricultural techniques but lamented the lack of information, training, and subsidies for such practices. The continued use of traditional instruments not only consumes more time and energy but also affects the quantity of agricultural produce.

Seed variety



Only 6 percent of the people are completely depending on traditional seeds. 20 percent farmers are totally depending on only hybrid seed varities.74 percent farmers are using both traditional and hybrid seeds. People are not believing that traditional seeds are good. They are not aware about the preservation techniques of traditional seeds. They are taking seeds from private shops. They are unaware about different varieties. Whatever shopkeeper is preferring them they are taking it for cultivation. This year 8 people got seeds from government after online registration under seed and fertilizers scheme.

Fertilizers



From the above chart it is inferred that 79 percent people are using both organic and inorganic fertilizers for their crops. Only 10 % people are completely using organic fertilizers like animal dung and vermicompost for their farms. 11 percent people are completely using chemical fertilizers for their agriculture. The organic fertilizer of animal dung is available in the village. Because more than 50 percent of the people are having livestock. But people are believing that it will not give more production. Another issue there is no any availability of manure pit in the village. Because of that the animal dung is not properly stored for decomposition.

Women participation

Out of the 100 individuals surveyed, only 8 women were identified as the primary decision-makers and landholders in farming. These women independently manage their agricultural activities. Among the sampled women, 74 had no formal education, 15 received primary education, and only 11 had education beyond the seventh grade. The village follows a system of early marriages, which contributes to limited education opportunities for girls. As a result, girls as young as 13 years old begin working in agriculture, gaining practical farming skills through hands-on experience. On average, women in the village dedicate 6 to 7 years of their working hours to agricultural activities, developing expertise in tasks like sowing, weeding, and harvesting. However, not all women possess technological skills related to modern agricultural practices.

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Cost Benefit Analysis

The chart is about the cost benefit analysis. This is showing the profit and loss to farmers.

Particulars	Kharif Crops				Rabbi Crops		
Crops	**Soya**	**Cotton**	**Jowar**	**Turmeric**	**Sugar**	**Chick Pea**	**Wheat**
Land preparation cost	1000	1500	1000	1500	1500	1000	1000
Sowing (labor cost)	1500	800	1500	1600	1600	1500	1500
Cost on Machineries	2500	3000	2500	3000	3000	2500	2500
Cost on seeds	3700	1500	700	10000	10000	3500	2000
Crop protection cost	1400	3200	1500	2000	2500	1400	1400
Organic fertilizers	5000	5000	2000	5000	5000	0	0
Chemical fertilizers	1700	3400	1700	6800	7200	1400	1700
Weeding (labor cost)	4000	3000	2000	5000	5000	0	0
Irrigation cost	2000	6000	2000	5000	10000	3000	4000
Harvesting and processing	5000	4000	4000	7000	12000	4000	3000
Transport and others (opportunity Cost)	3000	5000	1000	3000	7500	2000	3000
Total Expenditure	25800	36400	19400	54400	49900	23300	25100
Total yield	8 quintals	8 quintals	12 quintals	10 quintals	50 ton	8 quintals	15 quintals
Income	40000	56000	26400	69800	110000	32000	34500
Profit, Income-Expenditure	14200	19600	7000	15400	40200	8700	9400

There is formula ‘profit= income – expenditure’ used for the calculating the profit. Here two costs are their input cost and output cost. In input cost it covered the land cultivation cost, sowing, fertilizers, pesticides, opportunity cost, etc. Whatever the production it will come under the output cost. The data from the table indicates that the highest profit is obtained from cultivating sugarcane. However, the area dedicated to sugarcane cultivation is limited due to the absence of a nearby sugar factory. Cotton, on the other hand, has the largest cultivated area and provides the second-highest profit after sugarcane. However, the profit from sugarcane is twice as much as that from cotton. Turmeric, despite yielding profits exceeding 15,000, is cultivated on a smaller scale due to transportation challenges.

Conclusion and Way Forward -The village of Shekapur has a total of 507 agriculture cultivators and encompasses 662 hectares of land. The fact that 536 hectares of land are under cultivation highlights the significance of agriculture as the primary livelihood. Cotton and soybean are the major crops, occupying over 75% of the land. More than 90% of the farmers in the village are classified as small and marginal farmers, with 466 falling into this category. In recent years, some farmers have begun cultivating cash crops such as sugarcane and turmeric. However, these crops only occupy 10% of the total land area. Since the year 2000, advanced irrigation techniques like drip and sprinkler systems have been introduced.The changing climate has posed significant challenges to agricultural production in recent years, with both floods and droughts affecting yields. Income levels of farmers vary based on the size of their landholdings. Those with less than one acre of land earn up to Rs. 25,000 annually, while those with 2.5 to 5 acres earn up to Rs. 100,000. Farmers with more than 7 acres of land generate an income of around Rs. 500,000.The villagers face several agricultural-related issues, including the lack of machinery, the absence of government seed and fertilizer centers, limited access to advanced irrigation systems, the unavailability of a nearby sugar factory, and the absence of agricultural product processing units. Proposed solutions include the establishment of custom hiring centers, promoting organic and integrated farming, and implementing watershed programs.The village has a bank located 6 kilometers away in Kandhar, and 35% of the villagers take loans from this bank. Approximately 23% of the farmers have benefited from loan waivers, which are granted based on repayment history and crop losses exceeding 50%. However, those who do not qualify for loan waivers and also face crop losses often turn to moneylenders to repay their bank loans, creating a paradox regarding the belief that bank loans rescue farmers from the clutches of moneylenders. Overall, the village has potential water availability, but productivity is hindered by small and marginal landholdings as well as the lack of advanced machinery. The villagers aspire to adopt advanced farming practices akin to those observed in western Maharashtra. Achieving this goal necessitates focusing on soil conservation, implementing advanced agricultural techniques, and receiving proper guidance from agricultural offices. With these measures in place, the villagers' dream of advancing their farming practices can be realized.

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