

**AN IMPACT OF CORPORATE SOCIAL RESPONSIBILITY (CSR) ACTIVITIES
ON AGRICULTURAL GROWTH AND WOMEN EMPOWERMENT IN VILLAGES
OF CHHATRAPATI SAMBAJINAGAR (AURANGABAD) DISTRICT
IN MAHARASHTRA, INDIA**

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GOKHALE INSTITUTE OF POLITICS AND ECONOMICS

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**An Impact of Corporate Social Responsibility (CSR) Activities on Agricultural Growth
and Women Empowerment in Villages of Chhatrapati Sambhajnagar (Aurangabad)
District in Maharashtra, India**

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DECLARATION

I, Madhav Rangrao Inchure, hereby declare that this thesis on the topic entitled, **“An Impact of Corporate Social Responsibility (CSR) Activities on Agricultural Growth and Women Empowerment in Villages of Chhatrapati Sambhajnagar (Aurangabad) District in Maharashtra, India”** is submitted for the award of Degree of Philosophy in Economics to the Gokhale Institute of Politics and Economics, Pune 411004. It is an original contribution and was completed during my tenure as a research scholar at Gokhale Institute of Politics and Economics, Pune.

This thesis has not been submitted by me elsewhere for the award of any degree or diploma-part or full. The information gathered by me elsewhere for the thesis is original, true and factual. Such material as has been obtained from other sources has been duly acknowledged in the thesis. I hereby request that you consider the thesis for the award of the degree of ‘Doctor of Philosophy’.

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CERTIFICATE

Certified that the work incorporated in this thesis entitled “**An Impact of Corporate Social Responsibility (CSR) Activities on Agricultural Growth and Women Empowerment in Villages of Chhatrapati Sambhajnagar (Aurangabad) District in Maharashtra, India**” submitted by Madhav Rangrao Inchure was carried out by a candidate under my supervision. It is an original contribution and has not been submitted elsewhere for the award of any other degree. Such material as has been obtained from other sources has been duly acknowledged in this thesis. I recommend that the thesis should be considered for the award of the degree of 'Doctor of Philosophy'.

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LIST OF ACRONYMS

AAGR	Average Annual Growth Rate
CAGR	Compound Annual Growth Rate
CEI	Composite Entropy Index
CI	Cropping Intensity
CSR	Corporate Social Responsibility
CSR-IP	Irrigation Present
CSR-MI	Corporate Social Responsibility Micro irrigation adopter
CSR-NIP	Corporate Social Responsibility Irrigation is not present
CSR-NMI	Corporate Social Responsibility Micro irrigation non-adopter
GCA	Gross Cropped Area
GIA	Gross Irrigated Area
HA	Hectors
HI	Herfindahl Index
K.	Kharif
MCA	Ministry of Corporate Affairs
MEI	Modified Entropy Index
MHA	Millian Hectors
NAI	Net Annual Income
NIA	Net Irrigated Area
NMSA	National Mission for Sustainable Agriculture
NSA	Net Sown Area
PMKSN	Pradhan Mantri Kisan Samman Nidhi
PRA	Participatory Rural Appraisal
PSM	Propensity Score Matching
PSU	Public Sector Undertakings
R.	Rabi
SHG's	Self-Help Groups
VDC	Village Development Committee.
WUC	Water Use Committee

ABSTRACT

The key platform has been set by the New Economic Policy (1991) that benefited business development, benefiting companies both in India and internationally. The same policy effects in the context of the rural economy are understudied. While firms have benefited from village resources, such as water, electricity, land, and skilled labour, it is equally essential for them to give back to these communities. Whether they have adequately reciprocated these benefits to the communities raises a responsibility that cannot be overlooked. The question remains as to which firms have returned to the rural communities and in what proportions have benefited from these villages.

This study adopted a descriptive case study approach using primary and secondary data. It employed quantitative and qualitative research methods, including the Propensity Score Matching (PSM) method, to achieve the research objectives. The study covered all treatment and control villages with the nearest prioritisation score to each treatment village within each taluka. The present study involved a rigorous sample selection process, with 194 farmer households from CSR villages and 168 from non-CSR villages carefully chosen to identify the impact of CSR on agricultural development. Eighty women households from CSR villages and 80 from non-CSR villages were selected to determine the effect of CSR on Women's Empowerment. Notably, out of 80 women from CSR villages, 40 have directly benefited from CSR activity. A total of 522 households were selected for a sample from 1913 households, nearly 27.28 per cent of the total households.

The CSR spending trends and patterns vary for India and Maharashtra during 2014-15 to 2021-22. Despite annual fluctuations, the 14.5 per cent CAGR and 15.4 AAGR were in India, reflecting strong overall growth in CSR spending in India. Meanwhile, Maharashtra's CAGR was 16.43 per cent. The education sector received the largest share of CSR spending, which accounted for 28.2 per cent of all expenditures. Along with the education sector, the highest CSR spending was observed in health care and rural development projects, 21.6 per cent and 9.2 per cent, respectively. CSR spending varies significantly across districts in Maharashtra, leading to inequalities in fund allocation. Mumbai City, Pune, Thane, and Chhatrapati Sambhajnagar districts have received the highest CSR spending in eight years. In contrast, districts like Hingoli and Yavatmal have received negligible CSR spending.

We employed multiple regression models using primary data to determine whether CSR activities (soil, water conservation, and water resource management) have significantly impacted the agricultural growth variables. The coefficients of final regression models show that explanatory variables such as status of being a CSR village, irrigation present, micro irrigation adoption, and education have a significant role in determining agricultural production, productivity, net annual income of farmers, net yearly income from agri allied activity, crop diversification, cropping pattern, cropping intensity and employment in the agriculture sector. The final regression model underscores the significance of irrigation and water management in agricultural growth in villages.

We have developed the Women Empowerment Index to assess the impact of CSR activity on women's empowerment. Overall, women's empowerment was lower in non-CSR villages compared to CSR villages. Economic, social, and political empowerment were higher in CSR villages than in non-CSR villages. A multiple regression model was employed to identify the relationship between women's empowerment and age, education, category, and type of family. The regression result found that higher education levels from a nuclear family and belonging to NT/SC/ST communities were associated with improved women empowerment scores. Women's empowerment was negatively related to living in a joint family and positively associated with higher education levels.

The study also highlights the challenges faced by companies and NGOs while working at the village level. It found that companies and NGOs face many problems, such as misconceptions about them, a lack of awareness about CSR activities for the development of villages, expectation for immediate results, political salience, a lack of political vision, and legal permission. Despite such enormous challenges, substantial and long-lasting change is still possible with persistence, attention to local requirements, and flexible strategies.

Chapter-1

Introduction

“Business should be pursued with a view to benefit the poor, not just to become a millionaire or a billionaire.”

- Sri Jamnalal Bajaj

1.1 Background

In India, Corporate Social Responsibility (CSR) has been seen as philanthropy since ancient times. It has been referred to as integrating ethical, social and environmental concerns into business operations. The initial philanthropy practised by Indian businesses was based on religious beliefs and practices. But over time, the approach has evolved significantly, leading to a shift in its oldest forms. Philanthropy and the Gandhian trusteeship model were included in earlier forms of CSR. In India, CSR has evolved from traditional philanthropy and charity to a multi-stakeholder approach which aligns with current global trends (Sharma, S., 2009).

CSR is an integral part of corporate houses. When social costs exceed private costs, an externality occurs in the society, which is the primary cause of conflicts between corporations and it. Some activities impose costs on the society, known as negative externalities. Pollution, global warming, acid rain, etc., are examples of negative externalities. Inconsistencies between the business pursuit of profit on the one hand and safety and the well-being of the society and ecology on the other indicate risks in sustainability (Heal, G., 2005). CSR alone does not guarantee the solution to inconsistencies and promote self-regulation. A well-designed CSR program can solve these inconsistencies and ensure corporate houses take social responsibility seriously (Matthew & Jon, 2011). It can reduce or compensate for the gap between private and social costs. For example, in 1997, British Petroleum (BP) implemented a firm-wide restriction on greenhouse gas emissions, which raised net revenue by almost \$600 million while also raising costs. BP has worked as if social cost were a private cost (Heal, G., 2005). CSR bridges corporate objectives with societal needs, which is essential for sustainable development.

India is the first country in the world to adopt CSR spending and reporting, which is mandatory for certain firms after passing the New Company Act, 2013. Mandatory CSR could result in contradicting qualitative and quantitative anchoring effects (Deodhar, S., 2016). Under the new law, business model transformation and operational efficiency improvement are not considered eligible activities for CSR. Unwillingly, businesses will have detached themselves

from CSR initiatives that mutually benefit the world, people, and their bottom line. This may force firms to spend on simple philanthropic donations as specified in the eligible list (Deodhar, S., 2016). In terms of quantitative anchoring effects cut back on their CSR spending to meet the mandated minimum requirement, which may be lower than what expenditure would have been without minimum spending norms for example, Ambuja Cement (3.5%) to Zenith Fibers (7.6 %) were CSR spending under the heading, Donation, and Community and Social Spending (DCSS, 2014) which were more than 2 per cent. After mandated minimum spending, such firms and even other firms may reduce CSR spending to the minimum norms. This may lead to decreased CSR expenditure in India (Desai, Pingali, and Tripathy 2015). Implementation of mandatory CSR presents a significant challenge for businesses. This may create a substantial administrative burden. Owing to mandatory CSR spending and reporting, the administrative burden of firms may increase (Karnani, 2013).

In 2013, the Indian government made CSR mandatory to address these inconsistencies. Making it mandatory is one step, but an entirely different thing is to implement it at the micro level, and addressing the fundamental issues of rural areas is an entirely different challenge. According to the FICCI (2016), CSR implementation has several challenges. For instance, difficulties securing land clearances for rural infrastructure projects, delays in project execution brought on by issues obtaining a NOC from the appropriate authorities, and a lack of qualified human resources ready to work locally. In rural locations, the community frequently has doubts and does not understand the project's development aims. Getting physicians and medical personnel to operate primary care clinics in isolated areas is another major worry for businesses if the CSR initiative includes the provision of healthcare services.

CSR plays a crucial role in contemporary society. It affects all aspects of rural community lives and potentially alleviates challenges related to limited government funding for rural development. As such, in-depth studies are needed to examine how CSR initiatives impact rural development at the micro level.

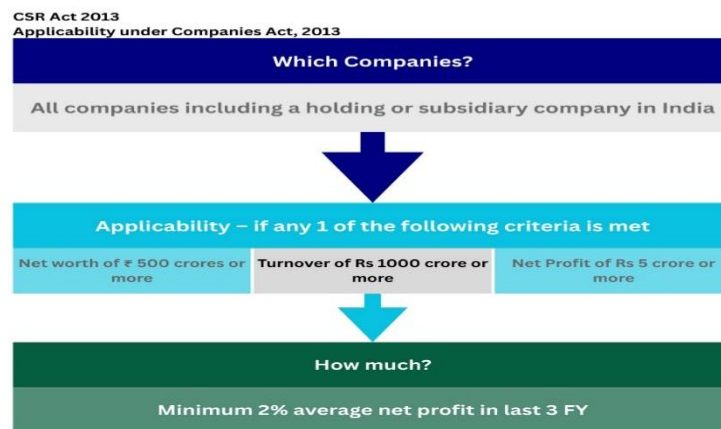
1.2 What is corporate social responsibility?

Carroll (1979) defines corporate social responsibility as the societal expectations that corporations have at any particular time regarding economics, ethics, law and discretion. CSR is defined as an enterprise's ongoing commitment to act morally, support economic growth and enhance the standard of living for employees and their families, as well as for the local community and society at large (WBCSD, 2000). CSR is the voluntary incorporation of social and environmental issues into business operations and stakeholder interactions (European

Commission, 2001). The definition of CSR is expanding daily. Its scope broadens to include a broader range of activities and impacts. CSR is a global concept that focuses on morality and social welfare. Every nation acknowledges CSR's economic, legal, social and ethical aspects. It helps in brand building and addresses social and environmental challenges. It is an essential part of business conduct.

1.3 CSR applicability under the CSR Act 2013

Figure 1 1:CSR applicability under the CSR Act 2013



Source: Author's Creation Based on MCA.

1.4 What is village/ rural development?

Rural development is a strategy to improve the social and economic well-being of a specific segment of the rural poor (World Bank,1975). It focuses on delivering development benefits to the most disadvantaged groups in rural areas such as tenants, landless individuals and small-scale farmers actively seeking employment. Rural development can empower specific groups, particularly impoverished rural women and men, to secure more of the resources they need and desire for themselves and their children. Demanding and controlling more of rural development's advantages involves supporting the poorest individuals seeking employment in rural areas. The group comprises landless people, small-scale farmers and renters (Chambers, 1983).

1.5 What is village adoption?

Village adoption involves collaborating with the local community to empower it to pursue village development in alignment with the SGDs. It focuses on understanding what works and what doesn't, and developing a model of village development for training and replication (NIRD&PR, 2017). Essentially, village adoption is just the process of engaging the communities for a specific objective which could be developed in this situation.

1.6 What is agricultural growth?

A consistent rise over a period of time in output, productivity and efficiency within the agricultural sector is collectively called agricultural growth. Areas such as forests, fisheries, livestock and crop productivity are included in it.

1.7 What is women's empowerment?

Women's empowerment is the process that helps women understand unfair treatment based on gender. It gives them the confidence to speak up at home, work and in the community. This has involved women taking control of their lives such as setting agendas, gaining skills, solving problems and developing self-reliance (UNESCWA, 2022). Women's empowerment is a dynamic and multifaceted process that empowers women to realise their full potential in all areas of life (Pillai, J., 1995). Women's empowerment is composed of five key elements: access to resources and opportunities, self-worth, freedom to choose, ability to govern own life and capacity to shape social change to establish a more equitable social and economic order on a national and worldwide scale (EIGE, 2024). To achieve all other SDGs, Goal 5 (Gender Equality: Achieve gender equality and empower all women and girls) must succeed. Women's equality and empowerment are fundamental to the 17 SDGs, as well as to inclusive and sustainable development. Girls and women must be allowed to live without prejudice or violence and have equal rights and opportunities.¹ People who have been denied the capacity to make wise decisions can learn to do so through a process of transformation known as empowerment.² It is crucial to remove the barriers that hinder them from identifying and achieving their goals (World Bank Gender Strategy, 2024-2030).

1.8 Research problem

Around 68.8 per cent of the population lives in rural India in about 6,40,867 villages and 54.6 per cent is still dependent on agriculture (Census, 2011).³ Agriculture and the allied sector contributed only 19 per cent to India's Gross Value Added (GVA).⁴ The contribution of rural communities to GDP is disproportionately low compared with the large population that depends on agriculture for its livelihoods. The existence of rural poverty is directly correlated to this unbalanced relationship. The proportion of the population below the poverty line in rural India was 25.7 per cent and in rural Maharashtra 24.2 per cent in 2011-12. The percentage of the population below the poverty line in urban India was 13.7 per cent and in rural Maharashtra

¹ UN Economic and Social Council, 2017.

² <https://www.unescwa.org/sd-glossary/women%E2%80%99s-empowerment>

³ Register General of India.

⁴ Government of India, Ministry of Agriculture & Farmers Welfare. Agricultural statistics at a glance 2022.

9.1 per cent in 2011-12 (NITI Aayog, India, 2024). BPL population is higher in rural areas than in urban areas, which shows income inequalities between rural and urban population and highlights the income disparities between the two. Significant investment is required in rural India to improve the rural economy's contribution to GDP, reduce dependence on rain-fed agriculture and low productivity, inadequate social security system, poor infrastructure, credit inadequacy and poverty traps in rural communities.

The key platform has been set by the New Economic Policy that benefited business development, benefiting companies both in India and internationally. The same policy effects in the context of the rural economy are understudied. While firms have benefited from village resources such as water, electricity, land and skilled labour, it is equally important for them to give back something to these communities. Whether they have adequately reciprocated these benefits to the communities raises a responsibility that cannot be overlooked.

The New Economic Policy has provided the private sector with a platform for business development. Both Indian and foreign business houses have benefited from this. However, its impact on rural development remains a subject of debate. Firms have gained access to many resources from the village such as water, electricity, land and skilled labour). The question remains as to which firms have gone back to the rural communities and in what proportions benefitted from these villages. Despite economic growth, 21.9 per cent of the Indian population lives in poverty (NITI Aayog, India, 2024). This presents ample opportunities for Indian companies to step forward and contribute to societal welfare through CSR initiatives. India is a developing nation and CSR needs to focus on fundamental questions. But as per the study by Dima, J., & Ramez, M. (2007), companies focus on implementation performance, and they do not focus on profound fundamental questions. Nor have they developed clear targets, metrics and due diligence in their pursuit of CSR.

1.9 Research questions

1. How have CSR initiatives in various sectors evolved over the past decade?
2. What were the CSR spending patterns and trends in India?
3. How does CSR spending affect the rural community?
4. How does CSR spending impact agricultural growth and women's empowerment in rural India?
5. What role does CSR spending play in improving agricultural productivity and promoting gender equality in rural communities?

6. Are companies promoting community involvement in planning and executing CSR activity in the adopted villages?
7. What are the various issues the companies face in implementing CSR activities in adopted villages?

1.10 Objectives of the study

1. To analyse the trends and patterns of CSR expenditure incurred by firms from 2014-15 to 2021-22.
2. To assess the impact of CSR activities on village development.
3. To identify challenges while implementing CSR activities in villages.
4. To recommend a policy to implement better CSR activities for agricultural growth and women's empowerment in the villages.

1.11 Research hypothesis

1. CSR spending tends to be higher in India's industrially developed states and districts.
2. Crop intensity and diversification are relatively higher in CSR villages than in non-CSR villages.
3. Changes in crop patterns in CSR villages differ from those in non-CSR villages.
4. Crop productivity per hectare is relatively higher in CSR villages than in non-CSR villages.
5. Adoption of environment-friendly technologies is relatively higher in CSR villages than in non-CSR villages.
6. Women's empowerment is observed in CSR villages.

1.12 Significance of the study

The development of the agricultural sector and women's empowerment in India continues to lag behind that of developed nations such as Australia, the USA, China, etc. With CSR being a legal obligation for corporate entities, this research is timely and essential. This study will analyze the current CSR practices in India and offer preliminary recommendations for its future direction. The current study's findings will simplify reforming the CSR framework and potential systemic weaknesses to rework the plans and ultimately coordinate them for the government's strategy on women's development and agricultural growth. It will explain how CSR can reduce poverty and empower women, impacting how CSR initiatives affect India's rural economy and village development. The study will provide policymakers with relevant information to design regulatory frameworks to create sustainable and effective CSR practices.

It also looks into the challenges with CSR implementation in rural areas. Examining them will help determine the methods and strategies that should be integrated into the linkages for developing effective CSR programmes in villages.

1.13 Scope of the study

The present study focuses on the Chhatrapati Sambhajnagar (Aurangabad) district in Maharashtra. The impact of CSR activities on agricultural growth and women's empowerment in the villages of this district has not been extensively studied by scholars primarily due to the scarcity of data and the scattered sample of recipient families. This study reveals the enormous potential of CSR to bridge the development gap between households in Maharashtra. The state continues to have the highest CSR spending in India (MCA, India, 2022-23). The need to conduct more research on the viewpoint of villages rather than that of corporations on CSR investment has been underlined by earlier studies. Therefore, there is a need to study the impact of CSR on agricultural growth and women's empowerment in the villages of Chhatrapati Sambhajnagar district.

1.13 Limitations of the study

The study's compactness limits generalisation and the investigator acknowledges an individual effort's distinct scope and activities. Due to constraints of resources and time, the study does not cover all CSR and non-CSR villages. Instead, it is limited to JBGVS-adopted villages in the Chhatrapati Sambhajnagar district. The study is confined to the period from 2014-15 to 2021-22, with data derived from household responses. It is based on three CSR villages and three non-CSR villages. In village development, the study has focused explicitly on agricultural growth, women's empowerment and water availability at the village level, providing a comprehensive understanding of these areas due to JBGVS CSR activities' focus on soil and water conservation, water resources management and livelihood programmes at the village level.

1.15 Outline of the study

This study is divided into eight chapters. The first chapter outlines the foundational aspects of CSR. It gives an insight into the research problem, questions, objectives, hypotheses, significance, scope, limitations and concepts used in the study. The second chapter presents a comprehensive literature review of CSR, village development, agricultural development and women's empowerment. It covers different aspects of these topics. It also highlights key trends, challenges and effects of CSR efforts. Chapter three has two sections. The first section looks at how CSR has developed over time, both globally and in India. The second section explores

a range of CSR theories, including the CSR Pyramid Theory, Shareholders' Theory, Triple Bottom Line, Stakeholders' Theory, Cross-Cultural Theory and theories related to rural and agricultural development and women's empowerment approaches. The research methodology and the study area profile comprise the two sections of Chapter 4. The study's research method is the main topic of the first part. It describes the methodology, layout, and methods for collecting and evaluating data. This section explains the research process, ensuring transparency and credibility in the subsequent analysis and findings. The second section presents a detailed profile of the Chhatrapati Sambhajnagar district, offering insights into its geographical, socio-economic and agricultural landscape. Additionally, the profile covers details about the adopted and non-adopted villages under CSR activities by JBGVS (Jankidevi Bajaj Gram Vikas Sanstha), Pune. This section also includes a profile of Jankidevi Bajaj Gram Vikas Sanstha Akurdi, Pune, the CSR implementing organisation of the Bajaj Group. These profiles provide the essential background information for understanding the studied area and the organisations involved in CSR activities. Chapter Five analyses the trends and patterns in CSR spending in India from 2014-15 to 2021-22. In Chapter Six, the impact of CSR on agricultural growth has been assessed. In Chapter Seven, the impact of CSR on women's empowerment and the availability of usable/drinking water has been assessed. Chapter Eight, concludes with recommendations to promote effective CSR implementation strategies and maximise the positive outcomes of CSR activities.

1.16 Summary

Research on CSR and its possible impacts on agricultural growth and women's empowerment in villages is relevant, as one could conclude after reading this introductory chapter. This results from several dynamic processes co-occurring both domestically and abroad. With the passing of the Companies Act 2013, India became the first country in the world to make CSR mandatory for companies. The next logical step is to determine how these CSR initiatives can best fit into national and international agendas so that everyone works together rather than competing.

Chapter -2

Literature Review

2.1 CSR background

Globally a multitude of scholarly articles have been penned and published on the subject of CSR. The last two decades have witnessed a rigorous discourse amongst different levels of the intelligentsia fraternity. The mainstream debate among the experts, business fraternity, academia and corporate leaders has brought the attention of intellectuals towards the field. This has resulted in a multitude of interpretations of CSR. Owing to this, academia witnessed a growth in the number of scholars who study the significance of CSR for the society. In this section, we delve deeper into various studies that address CSR and its significance for the society. Here, we examine the contributions of these studies in the last few decades.

2.2 CSR concept

As aforementioned, there is a substantial body of academic work that has tried to interpret various dimensions of CSR. "Corporate social responsibility is the commitment of business to contribute to sustainable economic development by working with employees, their families, the local community, and society at large to improve the quality of life in ways that are good for business and good for development," states WBCSD (2003).⁵, While delving deeper into this noble commitment, multiple layers come forth. Frederick (1960) defines social responsibility as having a public perspective on the society's financial and human resources, and ensuring that they are utilised for broader social objectives instead of specific individual interests. In contrast to this, Friedman (1962) has a profit-centric view. He argues that businesses have a single societal responsibility to use their resources to participate in profitable activities and to adhere to fair competition and ethics. Unlike Frederick and Friedman, Carroll (1979) provides a structured model encompassing legal and ethical duties, not just economic or social priorities. According to him, a business's social responsibility is the society's financial, legal, moral and discretionary expectations of organisations at any particular time. CSR's legal and ethical duties include voluntary and moral obligations towards public welfare. Similarly, Jones (1980) acknowledges the idea of CSR as the duty a business has to members of the public besides its shareholders, above and beyond what is mandated by law and union agreements. As CSR Europe (2003) highlighted, businesses can create value for stakeholders

⁵ WBCSD, 2003.

and shareholders. This can be done through innovating their strategy, organisation and operations to manage and enhance their social and environmental impact. The United Nations Development Organisation also put weight on the stakeholders' approach, stating that environmental considerations are vital in CSR activities. It states that "... corporate social responsibility is a management method by which businesses incorporate social and environmental issues into their operations and stakeholder interactions. CSR is commonly believed to be the process by which a business balances the Triple-Bottom-Line Approach economic, environmental, and social imperatives, while simultaneously meeting stakeholder and shareholder expectations." On a similar line, the European Commission (2003) states that businesses "... should have in place a process to integrate social, environmental, ethical, human rights, and consumer concerns into their business operations and core strategy in close collaboration with their stakeholders..." to fulfil their social duty fully.

While environmental management has been the primary emphasis of sustainable development scholars and practitioners, CSR participants have concentrated on social and ethical problems such as philanthropy, working conditions, and human rights (Sharma, S., and Ruud, A. 2003). Even among companies encouraging global environmental efforts, the social concepts of fairness and inclusivity in sustainable development have barely appeared on the business or research agendas. In the same way, Andersen (2003) investigated social, environmental, and economic issues, stakeholders, and voluntariness. He described corporate social responsibility (CSR) as behaving with consideration for the environment and the future generation while expanding one's immediate interests to include one's fellow citizens and the society in which one now lives. Frederick W., Post J., and Davis K. E. (1992) defined CSR as the idea that businesses should be held responsible for the consequences of their actions on their employees, their families, the local community and society.

2.3 CSR and legitimacy

Multiple studies have demonstrated that CSR helps businesses gain and maintain legitimacy by meeting society's expectations and building trust. Richa, G. and Anju, S. (2010) highlighted that stakeholders' pressure and performance have led to the presentation of CSR as an all-encompassing corporate strategy. Businesses consider the impact of their operations on society and their relationships with stakeholders as significant concerns. Profit and turnover influence CSR policies. Gautam and Singh (2010) suggest that business and CSR strategies are convergent, leading to the integration of these two areas throughout the organisation. As many

as 229 of the top 500 corporations were filtered because they failed to report on their CSR activity. Of the remaining 271 businesses, 49 per cent reported on CSR. Up to 229 of the top 500 companies were eliminated due to their failure to disclose their corporate social responsibility (CSR) activities. Of the remaining 271 companies, 49% submitted a CSR report. Few businesses have a structured CSR strategy, while many engage in token gestures. Numerous businesses spread their CSR budgets across multiple initiatives. This resulted in defining CSR differently based on their needs. Philanthropy is the primary driver of CSR, which is on an upward learning curve. Kavita, P. (2018) analysed the evolving trends in CSR expenditure during both voluntary and mandatory CSR periods in India. The study found a major rise in CSR spending by manufacturing firms. This increase was especially noticeable after the Companies' Act of 2013 was passed. At first, CSR efforts were mostly about giving donations. Later, during the mandatory period, the focus shifted to social and community development. Polluting firms consistently outspent non-polluting firms in both periods. Firms that previously spent less than 2 per cent of profits on CSR increased their expenditure post-act, while those spending more than 2 per cent reduced their spending. Firms carried out CSR through charitable trusts and foundations during the voluntary period. In the mandatory period, they began directly implementing CSR activities. The study also found regional differences in CSR spending. Industrially developed states received more benefits than less-developed ones. Moreover, most CSR funds were allocated to health and education, underscoring CSR's potential to complement the government's efforts for social and economic development. However, Section 135 of the Act limited the scope of CSR, constraining companies from adopting a more holistic approach.

Amit, M. (2024) explores the evolution of CSR in India, highlighting its legal frameworks, practical implementations and future directions. It has transcended from philanthropic gestures to a strategic imperative for businesses, integrating economic objectives with broader societal responsibilities. The Companies Act of 2013 mandates CSR spending and amendments in 2021 improved accountability and transparency. The future of CSR in India depends on legal reforms, more straightforward guidelines and rigorous oversight to mitigate greenwashing risks and align efforts with national priorities.

Komal, M. (2022) examined the legislative framework for CSR in company law, focusing on India's evolving CSR regime. The study finds that the Companies Act of 2013 is restrictive and focuses on charitable responsibility. However, the value theory advocates

institutionalising charitable responsibilities once a company fulfils its moral, legal and ethical obligations. The study suggests prioritising and systematically implementing economic and legal responsibilities first. Correspondingly, Akanksha, J. and Jean du P. (2022) examined the current regulatory framework of CSR in India. The study focused on the differing motivations, approaches and challenges of privately owned and government companies. Indian CSR regulations are too broad and prone to misuse, requiring legislative amendments for greater accountability and transparency (Akanksha, J. and Jean du P., 2022). The study also suggests that many companies still focus on shareholder interests despite a stakeholder-centric legal approach. It suggests strengthening the regulatory framework with stricter monitoring and auditing initiatives for third-party agencies and impact assessment.

Meera, S. (2017) underscores the shift from CSR to Corporate Social Obligation and the need for organisations to meet the 2 per cent mandatory CSR standard. The study highlights effective legal measures to guarantee partners' social, financial and environmental rights under the Act of 2013. The study also highlighted businesses' fear of damaging their reputation among shareholders and stakeholders. Government may force their companies to facilitate national projects, delegating responsibility for nation-building and social well-being to public sector undertakings. The CSR Act 2013 focuses on corporate philanthropy and charity rather than CSR. The MCA is moving towards making non-meeting spending requirements a criminal offence, raising concerns about whether such steps can guide companies towards more stakeholder-centredness and social responsibility. The current approach of relaxing CSR obligations is insufficient to address issues related to compliance with India's CSR regulatory framework.

2.4 CSR practices of companies

Several studies in the past decade have examined companies' CSR practices. These practices primarily claimed to balance profit-making and social responsibilities and reflect broader stakeholders' aspirations. Dipak (2017) examines the attitude of Amul Dairy's stakeholders regarding its CSR activities. The study found that linking CSR with corporate governance helps its growth and stakeholders' understanding. It shows that companies are more focused on societal issues. Michaels, A. and Grüning, M. (2018) made three main points. First, they argued that a company's CSR development stage is connected to its corporate identity traits. CSR disclosure strongly correlates with corporate identity traits that show a developed CSR idea. Firms with a shallow or early-stage CSR approach reveal much less information about CSR. Second, a company with low CSR engagement has more introverted corporate

identity traits, while those with high levels of CSR demonstrate value chain and forward-looking aspects. Third, the perceived need for legitimacy influences how much a company discloses about its CSR. In a like manner, the study of Savita Sharma (2016) underscores that CSR practices had a positive impact on the employees of luxury chain hotels. This participation in CSR resulted in enhanced productivity, improved job satisfaction, attracted high-potential candidates, increased morale and personal satisfaction and reduced attrition rate. Furthermore, the customers of luxury chain hotels that practice CSR improve brand value.

The study by Ulle and Ruth (2012) put forward varied outlooks. The study indicated that CSR predicts an innovation climate, particularly among younger and middle-aged employees. This is influenced by gender, age and education. Respondents with low and high educational levels did not significantly differ in terms of CSR and innovation surroundings. Women gave both aspects higher ratings, whereas males gave them lower ratings. Additionally, it is lower in middle-aged and older age groups and greater in younger age groups. Along similar lines, Marsden, C. (2001) conceptualised CSR as a form of philanthropy and offered insights. CSR is neither an optional extra nor a charitable deed (Marsden, C., 2001). Profitable operations that consider all positive and negative consequences on the environment, society and economy are operated by a socially conscious corporation.

Sree Devi Chunchu (2014) analysed the CSR activities of five companies in the public and private sectors. The study noted their compliance with statutory spending on health and education. This spending is routed through their foundations, NGOs, private agencies and public-private partnerships. There is accountability for the expenditure, lack of justification and unspent amount. In the same spirit, Shohreh, S. (2011) evaluates the CSR of selected firms in Mysore using secondary and primary data from Karmayog and a pre-tested questionnaire. Results indicate that no companies have reached the level of 5 in India. Moreover, there is a significant difference in CSR activities among public, private and multinational firms. Large and medium-sized firms prioritise social responsibility more than small ones. Still, ethical activities have no uniform pattern with philanthropic responsibility receiving more attention than economic responsibility (Shohreh, S., 2011). Public firms are better placed to contribute positively to improving India's social, economic, philanthropic and environmental conditions. In contrast, companies such as Reliance Industries, Tata Consultancy Services and HDFC Bank have been spending more on CSR since 2014 (Parmar, R., 2020). Other businesses including Bajaj Finance, Indiabulls Housing Finance, Hero Motocorp, ICICI Bank, IndusInd Bank,

Graphite India, Bharti Infratel, Adani Ports and Special Economic Zone, NHPC, Oil India and Shriram Transport Finance Corporation Ltd. have also recorded significant CSR expenditure. From a different standpoint, a study by Chetna, V. (2018) indicated that most FMCG companies meet stakeholder expectations of CSR in India. Disaster relief is the most crucial dimension, while education and training ranked fourth. The study also found that CSR initiatives have a more significant influence on satisfaction than retention in the context of FMCG companies. This results in a better corporate image and better financial performance. The motivating factors were leadership, values, ethics, brand building and individuality, while challenges were inadequate CSR culture, lack of know-how, shareholder support and societal influence. Top management should take immediate action to improve CSR initiatives and integrate them with other business activities for a competitive advantage. Seen differently, Sunit, L. (2018) examined the impact of CSR on community development through company schemes and programmes. It found a significant association between qualifications and CSR benefits, positive relationships between occupation and self-employment encouragement, and occupation and company sponsored training programmes. Conversely, no positive relationship was found between occupation and modern agriculture techniques.

Jitender, L. (2014), examines the practices of three Indian public sector undertakings (PSUs) Airports Authority of India (AAI), Steel Authority of India Limited (SAIL) and National Thermal Power Corporation (NTPC) focused on contributions to rural development. He analyses CSR initiatives across five key areas: livelihood, health, education, environment and infrastructure. Accordingly, education receives the highest priority among the surveyed PSUs, followed by health and livelihood development. CSR implementation varies with PSUs with some establishing dedicated divisions, while others depend on local management or specialised foundations. It concluded that CSR initiatives significantly benefited rural areas' socioeconomic growth. CSR in India changed from charity-based efforts to focusing on sustainable development. This shift emphasized long-term benefits. From another standpoint, Jitender, L. (2014) argued for aligning CSR programmes with national goals such as the Millennium Development Goals, engaging local communities in programme planning and execution, conducting external social audits to evaluate effectiveness and encouraging the government to act as a facilitator rather than a director in CSR initiatives.

In a corresponding study, Kaur, R. (2018) offers a comprehensive overview of CSR initiatives in India. She argues that Indian companies increasingly align their CSR strategies

with business goals to foster sustainable development. She identified four phases of CSR practice evolution. CSR in India started with a focus on charity and donations. Families like the Tatas and Birlas played a key role in supporting social causes. The second phase of CSR supported India's growth during the freedom movement. It was guided by Gandhi's idea of the "trusteeship" principle (Kaur, R., 2018). In the third phase, PSUs spearheaded CSR initiatives under the mixed economy model. The fourth and current phase integrates CSR into business strategies. India became the first country in the world that mandated corporate social responsibility with the Companies Act of 2013. Companies that make more than a certain amount are required by law to devote at least 2% of their net earnings to corporate social responsibility. It applies only to those meeting specific financial criteria. Current CSR trends show a rise in company spending on social work. Education and healthcare are key areas, led by firms like Tata, Mahindra, and ITC. Only around 500 of the 75,000 firms registered on the Bombay Stock Exchange practice corporate social responsibility. Therefore, Tata Steel's contribution is commendable. It operated in an underdeveloped area with very few contemporary medical amenities (Benjamin N., 2018). Initiatives include Mahindra's "Nanhi Kali" programme for girls' education, ITC's "e-Choupal" for empowering rural farmers, etc. More companies now work with NGOs and government programmes. However, challenges remain -unclear rules, weak enforcement, and poor alignment with company goals, which slow progress. Many firms still do not meet the 2 per cent CSR rule and spending differs widely across sectors.

Kaur R. (2018) suggests designing sustainable and scalable programmes that address the specific needs of local communities while aligning with national initiatives like "Make in India" and "Skill India." The focus is on building partnerships between businesses, NGOs and the government to share skills and resources. She also says that sharing CSR results openly shows transparency and accountability. Building on this, Ravishankar (2011) studied how international companies in India develop and apply their CSR strategies. CSR plays a bigger role in helping companies balance profit with social and environmental duties. It highlights the need for responsible business practices. The study employs an analytical framework from new institutional economics to assess CSR's impact on host community development. Ravishankar (2011) asserts that India's growing economy and global business presence exhibit a unique CSR context to tackle poverty and inequality. The study finds that local rules and systems shape CSR strategies. Their success depends on how well they fit with local customs and laws. CSR efforts have helped improve working conditions and local communities. But their overall

impact is still small due to weak support from institutions and their limited scale. CSR has redefined the relationship between business and society in India with the potential to evolve into a more significant driver of socio-economic development in the future (Ravishankar, 2011).

2.5 CSR in the context of village development

Literature in the past years has examined multiple aspects associated with CSR implementation in the context of village development, particularly in India. These studies explored themes such as improving rural infrastructure, education and livelihoods. Vivek, R. (2016) found that more women (55.3%) were aware of CSR projects in their villages and participated in them (26.2%) than men (15.6%). Most information about CSR was obtained from company representatives and relatives (26.6%). Over 70.4% felt that CSR projects were useful with 17.8 per cent focusing on education and 11.2 per cent on health. Most respondents (40.4%) felt that the asset created was a vehicle, and the more educated respondents felt that income generation was possible through CSR projects. Women felt that CSR had a more significant impact on education than men. A majority of them (55%) felt that wage employment increased due to CSR, and 27 per cent felt that it provided additional income. Most of them (47.6%) felt that CSR led to employment generation, while 24.6 per cent felt that health and hygiene had improved. The largest lifestyle change (22.8%) was due to vehicle ownership and the biggest negative impact (27.6%) was pollution. However, there are vast proportions of the population who feel negatively about CSR or are unaware of CSR activities being carried out in their villages. In another related study, Sanjay, P. and Akhilesh, R. (2010) reveal that Indian companies prioritise CSR as a crucial business issue, regardless of size, sector or location. However, there was no association found between the Millennium Development Goals and CSR projects. In the absence of having a dedicated CSR department, many businesses promote CSR programs through their foundation, human resources department, or NGOs. Another study by Miguel A. et al. (2016) examines the role of CSR in rural development. It evaluates 100 firms from various industries. The research aims to fill a gap in the literature on CSR's potential for rural development. The findings suggest a growing focus on social and environmental aspects. Edakkandi, M. (2023) studied a public sector company's CSR work in areas like education and skill development. The company's strong CSR focus shows in its management, standards and work with stakeholders. It uses a strategic approach to design and implement CSR initiatives, identifying social and environmental issues that intersect with its operations. It collaborates with local NGOs and community organisations to co-create sustainable

solutions. Effective governance of partner relations builds trust and knowledge-sharing and drives the creation of social innovations. Amruth, R. et al. (2016) explored an alternative viewpoint. They observed the current theorising on CSR implementation in rural areas lacks satisfactory guidance due to controversy over its spread, dissent regarding beneficiaries' awareness and its effectiveness in areas like livelihood, education, etc. A positive relationship was identified between CSR in education, health, environment, livelihood, infrastructure and special programmes on SCs and STs.

Several studies explored it in greater depth. Jatin, M. and Punjabi, L. (2016) look at CSR projects with an emphasis on rural development and how they impact the socio-economic growth of rural communities. Using secondary data, they explored the operating patterns of CSR. They claim that Indian companies, irrespective of their industry, scale or corporate goal, have realised the value of CSR and that their actions benefit the development of the rural sector. In the same vein, Dipti, M. and Kavita, C. (2014) assert that all companies were involved in CSR in one way or another. A majority of companies reflect their CSR philosophy in their mission and vision statements, policies and plans. Education has taken the top priority of the companies surveyed, followed by health and livelihood. For rural development, companies have focused on income-generating activities for livelihood, health, education and environment. Likewise, Nanjunda (2015) argues that CSR significantly impacts a nation's inclusive growth. It facilitates rapid inclusive growth and lessens reliance on the government for social expenditure. Businesses' CSR efforts have advanced to a level the government could not achieve. However, some reports suggest that most companies do not yet have CSR strategies. Indian corporations do participate in CSR initiatives, but it is insufficient in the light of their financial might (Nanjunda, 2015). Similarly, Muhammad, A. (2015) found that integrated CSR initiatives influence socioeconomic aspects with infrastructural development, economic growth, social development and environmental conservation as priorities. These initiatives benefit local communities which include improved environmental conservation knowledge, favourable plantation attitudes, higher rates of engagement in health and education, etc. Fatema, J. (2017) emphasises how CSR benefits Bangladesh's banking industry by guaranteeing stability and sustainability, enabling companies to compete in the world market. The studied banks had CSR policies and procedures in place, and they were carried out several projects. With a connection between the banks' CSR mission and the MDGs, the focus is moving from philanthropy to welfare and sustainable development. Alka, N. (2018) examines the impact of CSR activities on rural development in India. Most respondents are male and

have one to five years of working experience. CSR activities primarily focus on village adoption, employee support and development. The satisfaction relates positively to CSR and organisational efforts. Over 92 per cent respondents are satisfied and fully satisfied. Likewise, Rashida, H. (2019) shows that India's corporate sector is actively involved in social good with most companies implementing CSR activities related to their establishment. Some CSR activities such as civic amenities and computer literacy are less emphasised (Rashida, H., 2019).

2.6 CSR in the context of agricultural development

Multiple studies in the past decade have explored CSR in agricultural development. They examine its diverse impact. Balasubramani, N. (2017) studied Buchkewadi village with respect to empowering village-based institutions, implementing social fencing and collecting community contributions for maintenance work. A positive change has been observed in village family assets and environment has improved by cultivating 24 ha of fallow land, increasing groundwater levels, etc. The net cropped area increased by 96 ha in the kharif season and 218 ha in the rabi season whereby 281 tribal families benefited. The project also increased fodder supply, milk production and perennial irrigation. In a broader framework, Madhu (2022) says CSR is a win-win approach. It encourages companies to aim for both profit and sustainable development goals. It involves using cleaner energy and eco-friendly practices like pollution-free production. Public health awareness campaigns are another essential way CSR helps firms deal with major calamities like the COVID-19 epidemic. It gives organisations a competitive edge and has a favourable effect on financial success (Madhu, 2022). It is especially significant in India's agricultural industry as increased agricultural growth has been associated with lower poverty levels. In a more extensive context, Rajive, U. (2019) delves into CSR spending in the agriculture industry. Indian CSR spending in agriculture is significantly lower than in other sectors such as education and healthcare. Before the Companies Act of 2013, some large corporations voluntarily set aside a portion of their profits. The study underscores the necessity of a well-structured system to prevent duplication of government and CSR. Mandating CSR spending could alleviate agricultural hardships (Rajive U., 2019). Manida, M. and Nedumaran, G. (2019) examine how farms use internet-based agro-communication to support sustainable rural development and affect agricultural development through CSR. An analysis of 120 farmers' empirical data shows how private companies can support agricultural improvement practices and the advantages farmers can reap. Moreover, the prospect of e-communication in agribusiness strengthens the framework of e-farming and enhances the quality of life.

Enhancing rural officials and engaging farmers can boost e-communication's impact on agriculture through mobile apps (Manida, M. and Nedumaran, G., 2019). India has struggled to completely actualise its CSR initiatives, even though mobile platforms are used to deliver agricultural services. Marijana, D. et al. (2021) introduce an unconventional perspective. Accordingly, climate change prevents higher agrarian output due to drought and precipitation. The significance of sustainable agricultural development, legal foundations, and facets of agricultural social responsibility are all examined in this research. Comparative and logical deduction methods were used to review international and national documents and literature (Marijana, D. et al., 2021). The discussion on whether moral priorities affect economic performance will never end.

2.6.1 Irrigation and crop diversification

A substantial body of academic research and government and NGO reports on irrigation and crop diversification in India have been created. This section delves deeper into these studies. A compelling case study from Odisha by Basantaray and Nancharaiah (2017) delved deeper into the relationship between irrigation crop diversification and farm income. An inverse relationship between irrigation land and crop diversification was found. The study used the Herfindahl Index to measure crop diversification and found that increased irrigation leads to higher crop concentration and lower diversity. Paddy is a dominating crop and is water-intensive. Farmers do not use scarce resources for crops that can increase their net income. Average gross and net returns from cultivation are significantly higher in highly diversified districts than in moderately and less diversified districts. Irrigated land is mainly used for paddy cultivation; hence, the extent of irrigated land is lower than the extent of crop diversification. In a well-researched report of the AERC, Gokhale Institute of Politics and Economics, Pune, "The performance of micro irrigation in improving water use efficiency in Maharashtra's agriculture- The impact of Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) - Per Drop More Crop (PDMC), Shroff and Miglani (2021) examined the impact of the PDMC scheme on farmers. As per it, due to the PDMC scheme, the area under micro irrigation increased by 25.43 per cent. The share of cotton in total micro-irrigation is 24.04 per cent and of sugarcane 11.76 per cent. Due to micro irrigation, the area under horticultural crops increased while the cost of cultivation decreased. Labour person-days and expenses in drip irrigation decreased by 37 per cent and 40 per cent respectively. Water charges were reduced by 72 per cent and there was a 20 per cent reduction in electricity costs. Net profit by drip irrigation method was 63.37 per cent higher than the surface irrigation method. Nayak and Kumar (2019) carried out a study

of crop diversification in agricultural backwards areas vis-à-vis in relatively advanced coastal districts. Irrigation intensity, cropping intensity, agricultural income, rural road density and credit are significant factors for determining crop diversity. Irrigation intensity, high-yielding variety and credit facilities negatively impact crop diversification.

Multiple factors affect crop diversification: some are positively associated while others are not. Aheibam, et al. (2017) have attempted to identify which factor influences diversification. Using Heckman's Two-Stage Model, the first stage determines the possibility of seeing a favourable result, and the second stage calculates the amount of participation that depends on a positive outcome. Simpson Index (SID) has shown that education, farming experience, access to land, farming information, regular farming training and irrigation positively affect crop diversification. Dube L. (2016) investigated the determinants of agricultural diversification in Zimbabwe on a broader scale. Using the Herfindahl index and Tobin module, this study shows an impact evaluation of the Agricultural Innovation Support Project (GIZ AISP). The study used a control treatment method. The treatment group consisted of beneficiary farmers from GIZ AISP support and the control group consisted of non-beneficiary farmers. Age of heads of households, availability of draft power, communal tenure, number of extension visits, non-block training approach, farm commercialisation, improved commercial support and distance from town do not significantly affect crop diversification (Dube, L., 2016). This study also analysed crop specialisation factors. High soil fertility, members employed off farms, trained farmers and NGO extension service receivers are significantly associated with crop specialisation. Crop diversification is significantly influenced at the 1% significance level; the likelihood of crop diversification is favourable and increases dramatically with the number of household members with secondary education. The possibility of crop diversification rises by 2.325.43 per cent for each additional member with secondary schooling.

At the state level, Sanjive, K. and Sakshi, G. (2015) investigated trends in agricultural diversification toward high-value crops. The causes of crop diversity were identified using fixed effect and random effect models (REM) and the Hausman specification test was used for best model selection. SID has been used to identify crop diversity and it is divided into two groups: food crops and non-food crops. The studied period was split into two phases: 1990-91 to 1999-2000 and 2000-01 to 2011-12. For the regression analysis, gross irrigated area, cropping intensity and annual rainfall were considered independent and SID-dependent

variables. The area under total foodgrains exhibited negative compound average growth rates (CAGR) in Bihar, Himachal Pradesh, Kerala, Maharashtra, Assam, Gujarat, Madhya Pradesh, Odisha, West Bengal, and Tamil Nadu. At the same time, Jammu & Kashmir, Uttar Pradesh, Karnataka, Rajasthan, Punjab, Andhra Pradesh and Haryana noticed a positive but insignificant CAGR of the area under total foodgrain crops. Results demonstrated that high-value crop areas have experienced a significant increase (1.99%) during the past 20 years. As a result, the proportion of high-value crops in overall agricultural production has significantly increased. High-value farming is replacing conventional farming in Indian agriculture, as seen by SID trends and area expansion patterns. The impact of GIA was not statistically significant on the SID. Farmers tend to cultivate more cash crops than traditional crops (wheat and rice) in a state with irrigation facilities (Sanjive, K., & Sakshi, G., 2015). Annual rainfall and cropping intensity significantly impact the Simpson Index of crop diversification (SID). In another more in-depth study in Bangladesh, Rahman, S., & Kazal, M. M. H. (2015) measured crop diversity and its influencing factors over two decades (1990-2008) of data. To calculate the level of crop diversification, the Shannon index and the Generalised Least Squares (GLS) Random Effects model are used to identify the determinants of regional crop diversity.

All other crop groups experienced a decline except for the HYV rice, spices and vegetables area. The growth rate in cropped areas is highly varied across regions. Except for Khulna, Sylhet and Faridpur, crop diversity has continuously decreased throughout Bangladesh, and most regions saw a fall in their initial level of diversity from 1990 to 2008. Price and non-price variables substantially affect farmers' decisions to diversify crops. Increases in the price of vegetables and urea can substantially influence crop diversity. An increase in labour stock, average land size, extension service and growth in irrigation significantly affects farmers' crop diversity. The government promoted green revolution technology to achieve foodgrain self-sufficiency which intensively increased rice monoculture, leading to growth in its area and production. Another noteworthy study was conducted in West Bengal. Biswas, R. (2016) examined the performance of organic farming with crop diversification across various farm sizes and crop-growing seasons. Herfindahl Index (H.I.) and Modified Entropy Index (M.E.I.) have been constructed to assess the extent and type of agricultural diversification. Under organic and inorganic farming, small and sub-marginal farms saw the greatest crop diversity. Both farming systems had their most extensive diversity during the rabi season. There is greater diversification in the rabi than in the kharif and summer seasons, while inorganic farms showed greater diversification in the summer than in the Kharif.

Crops were more diversified towards high-value crops (like vegetables) in organic farming due to price premiums. A positive relationship between irrigation availability and crop diversification was revealed.

Along similar lines, Kumar, C. (2020) used Thiels' Entropy Index (TIE) to assess the level of crop diversity in Odisha and compare crop diversification between the southern tribal district Kandhmal and the coastal district Cuttack. The GCA of eight significant crops was used to measure crop diversification. Irrigation, telecommunication, tractor/power trailers, seed type, per capita income, credit and electricity were considered independent variables. CDI was regarded as a dependent variable for examining determinants of crop diversification in Kandhmal. Aggregately, all the determinants significantly impact crop diversification. Factors like credit, per capita income from agriculture and tractor/power trailers positively and significantly affect crop diversification. In contrast, irrigation, telecommunication, fertiliser and HYV seeds do not significantly impact crop diversification. Comparably, De, U.K. (2000) examined the growth and the spatiotemporal nature of crop diversification over time in the different districts of West Bengal from 1970-71 to 1994-95. It also looked deeper into its spatiotemporal patterns using various crop diversification indices. The HI, OI, EI, and MEI evaluate the degree of crop concentration or diversity.

The average acreage growth of boro rice was the highest, followed by potato, mustard and jute. The average acreage growth was negative for pulses, wheat, oats and sugarcane. Under baro rice, the CAGR was 7.78 per cent annually. It was 5.62 and 5.66 per cent for mustard and potatoes, respectively. In Bankura, Nadia, Cooch Behar and West Dinajpur, baro rice growth was exceptionally high. The highest increase in it resulted from an extension of the viable irrigation area. During the analysis, the study transformed values of HI and OI. The transformed HI was highest in Naida during 1970-73 and 1991-94. The percentage increase in the HI during the whole period was the highest in Murshidabad. The change in the HI was negative (concentration increase) in the districts of Birbhum, West Dinajpur, Purulia and Malda. OI also presented a similar value for negative diversification. The percentage increase in the OI during the period was the highest in Malda and negative diversification in Nadia, Birbhum and Purulia.. EI and MEI also examined results that were more or less similar. Nadia, Malda, Hooghly and Murshidabad districts always remain in the top five. Puraula, Bankra, 24-Paraganas, and Midnapore always stay in the bottom five in all four (HI, OI, EI, MEI) crop diversification indices.

2.6.2 Irrigation and cropping pattern

Numerous papers, studies, reports, and government and NGO publications have discussed irrigation as well as cropping patterns over the past decade. Halagundegowda, G. R. et al. (2015) assess the influencing factors of cropping patterns in different agro-climatic zones of Karnataka to evaluate changes in the cropping pattern and identify the determining factors in the period 1992-2002 and 2002-2012. To measure the extent of the shift in the cropping pattern, the Herfindahl Index (HI) and to identify determining factors, Principal Component Regression (PCR) have been used. HI was considered an dependent variable as Net irrigated area, Area under HYV (in ha.), rural literacy (%), number of agricultural labourers (numbers), number of financial institutions, number of livestock, rural road length (km), area under smallholders (ha), forest cover area (ha), number of IP sets and tractors were independent variables. The study demonstrated no shift in cropping patterns (i.e., crop specialisation) in the coastal and hilly zones. The PCR result showed that the change in the cropping pattern negatively impacted the first principal component. Variables like area under HYV, net irrigated area, number of agricultural labourers, number of smallholders, number of regulated markets and number of financial institutions were negatively influenced by the cropping shift. The second principal component positively influenced the change in cropping pattern.

The shift in the cropping pattern was positively impacted by variables such as forest-covered areas, rural literacy and rainfall. Still, the third and fourth principal components did not reach statistical significance. Another study is of significant importance in a neighbouring state, Andhra Pradesh. Mohan, G. (2017) has examined changes in cropping patterns at aggregate and regional levels from 1969-70 to 2004-05. This study relies on secondary data, and a fixed-effect regression module was used for analysis. The rice crop position was dominant from 1970-70 to 2004-05. The proportion of rice in GCA was 31.21 per cent, which decreased to 25.17 per cent in 2004-05. The area under sugarcane, maize, gram, black gram and red gram has increased in three regions and the state. An expansion in the area of high-value and vegetable crops has been observed. Common causal factors for the cropping pattern in the coastal regions have been identified through fixed regression analysis. These factors include irrigation, number of tractors, access to institutional credit, road length, rainfall, agricultural labour, average land size and population density (Mohan, G., 2017). Another notable study should be highlighted here. Praduman Kumar et al. (2003) noted that states in the northern region had seen a reduction in the area under coarse grains and pulses. Wheat and rice are now grown on significantly more land. A significant decrease was observed in the site

devoted to coarse cereals and an increase in the area dedicated to non-food grains in the western region. Rice, wheat and legumes have maintained their proportions in the die. The switch from low-productivity crops to high-productivity crops has caused changes in cropping patterns (Praduman Kumar et al., 2003).

Small farms engage in multi-diversified farming, cultivate in multi-diversified agriculture and grow multiple crops even on fragmented plots by allocating the space under seasonal fruits, vegetables, dairying, etc. The regional design in crop specialisation is rising. Taking a distinct approach, De. K. (2003) examined the evolving cropping patterns in West Bengal from an economic perspective, revealing that the development of irrigation and technology are crucial factors in determining crop patterns. Adopting different cropping systems is associated with productivity, profitability and income distribution. A better understanding of the sociocultural setting helps shed more light on the variables influencing changes in cropping systems (De.K., 2003). Following a similar approach but with a greater perspective, Ghosh B. (2011) used time series data to understand the determinants of the changes in cropping patterns in India from 1970-71 to 2006-07. Understanding agricultural diversification, it is first necessary to evaluate variations in land allocation for different crops over the years. No gross change was observed in the relative allocated area under major crops during the period. The percentage share of total cereal crops in GCA (viz., bajra, millets, jowar, etc.) has decreased from 61.39 per cent in 1970-71 to 52.21 per cent in 2006-07. Also, the percentage share of foodgrain crops in GCA declined from 76 per cent in 1970-71 to 64 per cent in 2006-07. During the period, the importance of tobacco and jute also showed a decline in GCA's percentage share. Sugarcane and oilseeds have benefited from the area allocation in GCA. The measure of HI in terms of acreage allocation shows that India's cropping pattern is skewed towards food grains due to substitution and expansion effects.

In a related way but with expanded coverage, Venkataraman, L.S., and Prahladachar, M. (1980) identified that in six states the share of foodgrains and non-foodgrains remained stationary during 1950-75. However, the percentages of wheat and rice improved. Growth in crop output was primarily the result of irrigation, the spread of HYV crops and technological transformation. As compared with Punjab, crop intensity was significantly lower in Rajasthan. Growth in crop output was less due to only 19 per cent of NIA in 1974-75. The share of foodgrains was the highest in GCA and for bajra percentage share was the highest among foodgrains in GCA from 1950 to 1975. Despite increased irrigation, productivity growth was

meagre in UP and high in Bihar compared with Punjab. However, an inferior crop pattern and relatively low yield were witnessed in Maharashtra. One primary reason is that only 9 per cent of the land was under irrigation. Changes in cropping occurred in Andhra Pradesh during 1950-75. The share of rice, sugarcane and maize was dominant in the crops. The spread of irrigation was the essential contributory factor to the growth of area and output. With a similar focus but at a micro level, Borkar, P. and Patil, E. (2011) used time series data from 1998–1999 to 2008–2009 to investigate the change in cropping pattern in the Chandrapur district. Spearman's rank correlation was used to measure the cropping pattern, revealing that there was no change in the cropping pattern in Chandrapur district between the two periods. However, land distribution among various crops was noted during the period.

2.6.3 Irrigation and water management/water conservation

Over the years, many studies have focused on irrigation, water management and conservation. They provide important insights that need further exploration. Likewise, the irrigation system's efficiency affects cropping pattern and evapotranspiration (ETc), as stated by El-Hadidy, E.M. et al. (2014). The study examines how irrigation projects affected crop patterns and water use in the north delta in 2011 and 2013, before and after the improvement. The pixels of the chosen canal were divided into seven land uses during both summer growing seasons. Cotton (42.7%), rice (33.3%), seed melons (14.5%), and maize (9.5%) were the top four crops before to the improvement. However, following the improvement, maize (6.0%), cotton (9.2%), seed melon (10.7%) and rice (74.1%) took the lead as the main crops. After the adjustment, the percentage of rice significantly increased by almost 113 per cent. However, there was a decline of 79 per cent, 40 per cent and 29 per cent in cotton, maize and seed melon respectively. When compared with the locations in which they existed before the modification. The Landsat data concluded that the water requirement/ha was reduced by around 6.3 per cent. Due to urbanisation, the cultivable land fell by almost 4.3 per cent irrigation between 2011 and 2013. However, there was a 25 per cent. irrigation rise in the uncultivated area. Another study by Asawa, A. (2018) assesses the possibilities of farmers' contribution toward capital cost in the Nira-Deodhar Project and explores current irrigation practices. A number of farmers showed willingness towards the capital cost of the proposed water canal. It is observed that farmers have diversified towards vegetables. Having membership in WUA and SHG was not found to be a significant variable where the project already exists.

A parallel study in the African context by Masha M. et al. (2021) assessed the impact of water and soil conservation (SWC) practices on farm income and crop production of 378 rural households (109 SWC adopters and 169 SWC non-adopters) in Southern Ethiopia. By limiting unobserved variability, the PSM method was applied to assess the impact of water and soil conservation strategies. The study shows that adopter households' mean values of farm income were higher (17372.67 Ethiopian Birr per year) than those of non-adopter families (13883.22 Ethiopian Birr per year). Crop production and farm income for SWC adopter households compared with non-SWC adopters showed that crop yield and annual farm revenue were more significant when farmers applied sustainable water and soil conservation methods on their farming sites. The impact of SWC adoption was higher on wheat production adopters. The average wheat production was 6.54 quintals per ha for SWC adopter households and 4.96 quintals for SWC non-adopter households. The mean value of adopter households' wheat production (6.54 quintals per hectare) was higher than that of non-adopter families (4.96 quintals per hectare). SWC practices generally enhance crop productivity, farm income, and rural life. However, focus has yet to be on maintaining demolished structures, mass adoption, or combining physical conservation with biological and agronomic methods. Some of the world's socioeconomic and environmental concerns are unsuitable agricultural practices, steepness of the field and its undulations. Soil erosion is a critical problem in some countries. A. Belachew et al. (2020) identify factors influencing the adoption of SWC. A multivariate Probit model was used to examine the variables affecting the adoption of SWC practices, which explained the relationship between various water and soil conservation practices chosen by farmers. This study considered check dam, strip cropping, soil bund and stone bund as dependent variables. Sex, age, household size, education, access to extension service, livestock size, the slope of farmland, participation in training, farm distance, land size and access to credit were independent variables. Factors such as age, sex, educational attainment, family size, livestock holding, amount of land owned, access to financing, availability of extension services and participation in training impact the adoption of particular SWC practices. The growth of the agricultural industry is limited by land degradation brought on by soil and nutrient losses. To address this issue, the Ethiopian government has implemented many Natural Resources Management (NRM) initiatives. Many activities have been carried out to promote SWC. On this front, Abebe, Y. and Bekele, A. (2014), using PSM to estimate the causal treatment effect, have assessed the impact of water and soil conservation on the income and productivity of agriculture in the Adman district of Ethiopia. They identified the positive impact of SWC activity on crop productivity and household income. However, no statistically significant

variation was observed between the two groups regarding crop productivity and household income. The potential explanation is that SWC programmes have long-term objectives and their effects will be felt over time when activities are intensified and adopted more widely.

In a different way, the Cobb-Douglas specification module was used to estimate the result by Haq, R. and Shafique (2009). The result was an R-squared of 0.84, indicating that labour and capital growth rates explain 84 per cent of the variations in total agricultural growth. Labour force and capital stock significantly affect agricultural output growth. The improvements in labour input (skills, procedures and management) and capital stock (mechanisation and advancements in seeds, fertilisers and pesticides) significantly impact output. Haq and Shafique (2009) also analysed the effect of water management on output growth rate through capital growth. The cost of electricity in Pakistan has continuously risen, negatively affecting output growth. On the other hand, credit access of farmers, water at farm gates and the presence of tube wells significantly affected output growth. Water resources are becoming scarce and there needs to be more room for expansion in irrigated areas. The irrigation system has significant issues with restrictive system design, unequal water distribution, low delivery effectiveness, inadequate drainage, water logging and overuse of groundwater in new areas. Through a distinct lens, India had been urged to double farmers' income by 2022. Therefore, many state governments took initiatives to increase productivity, improve crop diversification and increase the farmers' income. Kushwaha, T. et al. (2019) have assessed the impact of the Kshir Sagar Abhiyan programme in Madhya Pradesh on farmers' income and employment. Before the intervention, the farming families' net annual income was ₹ 67019, which has increased to ₹140623 now. Before the pond-based irrigation system was established, employment was 2,58,820 person-days/year. It generated 3,16,012 person-days/year employment from crops and animal husbandry practices.

2.6.4 Irrigation and crop intensity

Many studies in the last 20 years have examined how irrigation affects crop intensity. They have examined the nature of the relationship between irrigation and crop intensity and its overall influence on agricultural productivity. Vaidyanathan, A. & Rajagopal, A. (1992) observed that there was no significant trend in output per hectare of unirrigated land. The primary drivers of agricultural production growth in India have been the development of more extensive and superior irrigation systems, improved varieties of seeds and increased fertiliser use (Vaidyanathan A., 1994). With a moderately similar approach, Dhawan, B. (1991)

examined variations in irrigation and agricultural intensity across India, finding the link between agricultural intensity and irrigation across time. No clear pattern was found in the study of how different irrigation sources impact cropping intensity. In a partially parallel assessment, Karunakaran, K. and Palanisami, K. (1988) examined the impact of different sources of irrigation on crop intensity in the investment pattern of minor and major projects in Tamil Nadu, indicating a strong correlation between crop intensity and irrigation development. Surprisingly, post-1979–1980, tube well and dug well irrigation significantly influenced cropping intensity. In a similar context, Sivasubramannian, K. (2000) examined cropping intensity in various villages with a moderately similar approach. In both years, the cropping intensity was higher for farmers with and without wells. The availability of wells water and the location of land significantly impacted it. In cropping intensity, well farms came in first, followed by head segment non-well-tended farms, and then inside a village. Unlike the tail-reach farmers, the non-well-head-reach farmers harvested the land more intensively.

One of the best methods to increase agricultural productivity and rural employment is to increase cropping intensity. However, its degree is determined mainly by the agroecological conditions and how inputs are used in agriculture. When all agricultural inputs are considered, the cropping intensity is mainly controlled by the availability of irrigation water and its efficient usage. In an international context, in a loosely related examination. Cropping intensity within an irrigated region is increased in Nepal when subsistence farming is converted to commercial farming, according to Kaini et al. (2020). In both irrigated and unirrigated rural areas, differences in agricultural intensity have an impact on the range of job options and poverty levels. Bhattarai et al. (2002) observed that migration from low-cropping-intensity rainfed regions to high-cropping-intensity irrigated regions is observed in the rural economies of Asian nations. In a relatively comparable analysis, in a global context, Siebert et al. (2010) noted patterns of cropping intensity, high cropping intensity in areas where irrigation water is available and low cropping intensity in arid regions without irrigation facilities. In a partially parallel assessment, Mondal, T. and Sarkar, S. (2021) analysed irrigation and cropping intensity from 1996-97 to 2015-16 in North Twenty-Four Parganas, West Bengal, using partial correlation, residual mapping and hierarchical cluster analysis to assess the relationship between irrigation intensity. A low positive correlation between irrigation and cropping intensity was found in the district. Cropping intensity was also influenced by other factors such as fertilisers, technological inputs and HYV seeds of cereals. Two distinct trends were observed in irrigation and cropping intensity during the studied period. In the agricultural blocks of the

coastal saline region and Ichhamati River Basin, irrigation and cropping intensity have increased. However, cropping intensity has increased in the agricultural blocks of the Gangetic plain despite a decline in irrigation intensity.

2.6.5 Irrigation, production and productivity

Multiple studies and reports by the government and NGOs are vocal about irrigation, production and productivity. Correspondingly, Narayanamoorthy A. et al. (2018) have assessed the economic impact of drip irrigation on vegetable production in the Sivagangai area of Tamil Nadu where farmers irrigate their brinjal crops using the drip and flood systems. They employed partial budgeting to examine technical and economic aspects of brinjal with and without DMI. Drip irrigation requires capital expenditure and estimates its net present worth (NPW) and benefit-cost ratio (BCR). Even though the farm business revenue from brinjal cultivation using DMI is significantly higher than that from the conventional irrigation method, according to Narayanamoorthy et al. (2018), this cannot be treated as adequate (real) profit because they have not taken into account the cost, depreciation and interest on capital investment associated with the installation of drip system. The latter increases agricultural output by 52 per cent, saving water (40%) and power (629 kWh/acre), while reducing the usage of other inputs such as fertilisers by 31 per cent. Its use in brinjal cultivation yields 54 per cent greater net returns than the traditional irrigation strategy. In the same vein, Dhawan, B. (1989) shows a positive relationship between yield per hectare and the availability of irrigation infrastructure. The yields on irrigated land are significantly higher than those on unirrigated land, except for Bihar and Central India. In contrast to maize, kharif cotton and groundnut crops are equally good in their productivity in irrigated land. Similarly, but in a macro context, Zaware, S. (1988) explains how quantitative and qualitative changes brought about by irrigation on agricultural production increase productivity per unit area by inducing the use of other complementary inputs like pesticides, fertiliser, HYV seeds, etc. It promotes the growth of GCA by making double and multiple cropping possible. Allowing farmers to plant high-yielding, high-value and water-responsive crops on their grounds may also increase productivity. Watering has a significant impact on production increase because it prevents the use of fertilisers and other chemicals and introduces fertiliser-responsive crops during the post-irrigation phase. Using irrigation only to support rainfed crops during the monsoon can help reduce production swings. But using the same water for summer crops can further boost overall output.

Several other studies are important and require further in-depth analysis. Dunusinghe, P. (2021) examines the irrigation-productivity link (2007-2019) using the Cobb-Douglas production function ($y = X\beta + \mu$) to explore how yields relate to agricultural inputs based on data from the Department of Agriculture in Sri Lanka. Using a multiple regression approach, the impact of irrigation on crops like paddy and maize was studied. The results show a strong positive relationship between irrigation and crop productivity with yields in irrigated areas being 30-40 per cent higher than in rain-fed areas. Simultaneously, the occurrences connected to drought or floods significantly affect agricultural productivity. Moreover, extreme weather conditions in irrigated and rainfed systems reduce paddy and maize productivity by around 20 per cent. Productivity increases when pre-harvest mechanisation costs rise - a 10 per cent improvement in pre-harvest yields and a 1.5 per cent increase in productivity in maize. Increased mechanisation will enable Sri Lanka to further increase the productivity of both paddy and maize (Dunusinghe, P., 2021).

2.6.6 Irrigation and income & employment

Recent studies have proved a strong correlation between irrigation, income and employment. This makes an excellent case for the need for a comprehensive analysis in both global and local contexts. Analogously, Tesfayohannes, S. et al. (2022) using the PSM method assessed the outcome of water and soil conservation practices on crop income in Ethiopia. The propensity scores for the two groups (control and treatment groups) were determined using a logistic regression model. Farmers' participation in soil and water conservation practices was significantly influenced by training, livestock ownership, land holding, distance from home to a farmer's training center, extension contact, total acreage owned, and household age. Crop yields were higher for participants in the soil and water conservation program (Treatment Group) than for non-participants (Control Group). After examining the global context, it is essential to analyse the local perspective. Karlberg, L. et al. (2015) investigated the biophysical implications of agricultural water interventions (AWI) signifying crop yields for various cropping systems with and without agricultural water interventions from a hydrological model SWAT. AWI significantly impacted on income of farmers in the Kothapally village in Andhra Pradesh. Farmers have shifted cultivation of a high-value crop during the monsoon season (cotton), supplementing irrigation to bridge dry spells and replacing a traditional crop (sorghum), as well as by improving the capacity to produce dry-season, fully irrigated vegetable crops, in this case, exemplified by onion. Additionally, it was discovered that access

to irrigation was more crucial for farm income than crop selection and AWI. Farms with access to irrigation benefited from AWI more than those without it.

Mishra, K. (2023) assessed the impact of effective water management on income and employment generation in the Puri district using secondary and primary data. Information from respondents between April 2014 and March 2015 is included in the pre-WUA era data, whereas data from April 2018 to March 2019 is included in the post-WUA period. Also, the paired t-test is used to derive statistical conclusions and OLS is used to determine how WUA participation impacts revenue. The association's beneficiaries have increased their income through effective water use and created new jobs. The job generation between the pre- and post-WUA periods differs significantly. In other words, involvement in WUA has impacted the creation of jobs. Except for plantation crops, other crops provided significant employment potential due to WUA participation. Foodgrain crops, horticultural crops and cash crops promoted additional employment in the agricultural sector. WUA participation has a favourable and significant impact on farmers' incomes.

2.7 CSR in the context of women's empowerment

As mentioned, CSR has seen an unprecedented evolution in the past two decades. Despite that, few studies have examined its role in women's empowerment. Sudeshna S. (2018) examined women's economic empowerment in selected industries in West Bengal, revealing that only a few of them sustain their jobs and enterprises. There is a lack of long-term benefits of CSR programmes, which focus on short-term durability alone. Despite social empowerment being a precondition for economic empowerment, participation in empowerment is low. Women still act according to their dictates at home and outside the workplace despite receiving CSR-based training on livelihood activities. In Odisha, another study remains relevant. Manosmita, M. (2016) examines corporate involvement in community development through a case study of CSR activities by Tata Steel in Odisha and Jharkhand. To understand the overall impact of the company's empowerment initiative, women in the locality had fewer opportunities due to the social context and were less conscious of empowerment. Tata Steel's CSR and Community Service Programmes (CSP) have improved women's self-confidence and personality, leading to better living conditions for the villages. The company's CSR goals are based on national goals, demonstrating conformity with the nation's needs and approach (Manosmita, M., 2016). With a similar objective but on the macro level, Ramar, P. (2024) evaluates the impact of CSR initiatives on women's empowerment in India. It examines existing literature, case studies and data to evaluate how effective CSR programmes are in

promoting gender equality, economic opportunities and social inclusion. It looks at how government policies, institutions and partnership support are effective CSR programmes. These factors play a key role in making CSR interventions successful. More comprehensively, according to Uday K. and Arun K. (2013), women in India work more physical labor than males, eat less, have less access to healthcare and educational opportunities, and earn less money, yet they are still responsible for taking care of the family and raising the children. This paper explores empowerment, its relation to women, the growing role of women in society and CSR in India. Multinational enterprises play a significant role in improving women's empowerment in India (Uday K. & Arun K., 2013). Taking an entirely dissimilar approach, Jitendra S. and Litty D. (2023) discuss the CSR expenditure of companies in the Bombay Stock Exchange, focusing on social barriers and the impact of interventions on gender equality and women's empowerment. As many as 95 per cent companies spent their CSR budget on promoting women's empowerment. The article defines women's economic empowerment as the ability to compete and make the market work for women. Challenges faced in the preparatory, entry, growth and sustenance phases are categorised by caste, class, religion, geography and region. The CSR interventions must consider gender and intersectionality to address women's economic development challenges. Using a distinct method, Sowjanya, S. and Basil H. (2019) argue that CSR is the organisation's responsibility to operate socially and contribute to societal change. The CSR of selected companies considers the welfare of the society where they operate. Public awareness motivates other companies to join the confederacy and actively address issues. By adopting a separate strategy, Radhakrishnan, S. et al. (2017) argue that the livelihood loss caused by corporations is not adequately compensated, creating a false sense of welfare. CSR is a method of minimum compensation for damage caused by the corporate sector.

Further studies are necessary to explore this topic. Similarly, Akash, B. and Mridula, S. (2018), using a causal loop model, highlight the importance of a system dynamics approach in invigorating women's empowerment through CSR, also dedicating efforts from organisations and society to help women in distress and eradicating deep-rooted issues of disregard for women. CSR activities and a causal loop model can achieve a well-balanced society. With a similar approach but on a micro level, Akansha, G. and Vinod, K. (2018) explore CSR in promoting women's empowerment and its initiatives within organisations and corporate efforts to empower women from vulnerable backgrounds, focusing on responsible and sustainable societal management. Collective strategies beyond micro-credit are needed to increase

women's endowments, enhance their exchange outcomes and address sociocultural and political spaces for poverty reduction and women's empowerment (Akansha, G. and Vinod; K., 2018). From a unique perspective, Lauren, M. (2017) argues that CSR policies often focus on women's empowerment, but there are myths surrounding power and gender. Many CSR policies portray women as objects for empowerment which is criticized for casting women in the global South as voiceless victims or beneficiaries. According to Banerjee (2010), CSR literature ignores the demand side of the CSR equation as well as the agency, resistance, and choices of workers and communities. Empowerment in CSR management can be achieved through a feminist Foucauldian approach which moves away from binary gender understandings and explores power relations and consequences for certain groups. Participatory methods can offer innovative ways to understand individual experience and intention. Through a wholly different lens, Preeti, G. and Indu, B. (2022) discuss the concept of women's empowerment and its relationship with economic growth. Women are crucial in development and multinational corporations often have more economic power than small businesses. Empowering women requires the coordination of dedicated personnel, a committed community, political will and funding agencies. With a fundamentally different approach (financial), Bishnuprasad, M. (2018) examines the role of corporate welfare in women's empowerment and gender equality, highlighting significant budgetary actions, plans and programmes implemented by corporate houses and comparing state-wise expenditure. Corporations have entered the field of gender equity and women's empowerment through CSR. But their success depends on field interrogation and a clear-cut description of their interventions. Corporate houses neglect workplace issues and question the need for corporate boards to decide on gender equity and women's empowerment strategies.

2.8 Research gap

While reviewing the literature on CSR, it was found that there is a significant dearth of empirical research on how CSR impacts the development of adopted villages. Previous research primarily relies on secondary data including company reports and published sources by implementing organisations. It focuses on CSR implementation; however, core aspects of CSR policy are ignored. Furthermore, there is an absence of research assessing whether village adoption can improve CSR effectiveness through the participation of the community in the planning and execution process. The dearth of literature can be identified as to whether corporations follow minimum spending norms after the CSR mandate. Similarly, a significant contextual gap exists as no studies assess the CSR impact on adapted villages, especially in the

Chhatrapati Sambhajnagar district, from the beneficiaries' point of view. As a result, there is a need for valuing CSR's impact on adopted villages with the help of primary data.

While reviewing the literature on CSR, a dearth of empirical research was found on how CSR impacts the development of adopted villages, agricultural growth and women's empowerment. Research in this area has focused on secondary data, dependent on company reports and other published sources. Significant research has been done on CSR implementation by companies, but not on the fundamental aspects of CSR policy. Most studies tend to look at CSR from the company's point of view and not from that of the villagers. Many studies have been done on CSR, but no such study has been found on the impact of CSR on adopted villages. No studies have been done on whether village adoption is better or not for CSR activity by examining community involvement in the planning and execution process. Studies have been conducted on whether the companies follow minimum spending norms after CSR became mandatory and on the impact of CSR on adopted villages in the Pune district from the beneficiaries' point of view. Therefore, there is a need to evaluate the impact of CSR on adopted villages with the help of primary data and fill this gap. Ample research attempts to examine the determinants of agricultural growth, but hardly any attention has been given to finding the factors influencing agricultural growth due to CSR. Several studies on the impact of irrigation and the application of the drip irrigation method on high-value crops (e.g., cotton, banana, sugarcane and grapes) provide evidence of its techno-economic feasibility. However, hardly any study examines the impact of CSR activities on agricultural growth and women's empowerment in India. In light of this lack of clarity in the literature, it is necessary to evaluate how CSR initiatives affect women's empowerment and agricultural growth in adopted villages in the Chhatrapati Sambhajnagar district.

2.9 Summary

The present study highlights the impact of CSR activities on agricultural growth and women's empowerment in villages. The impact of CSR activities measures agricultural growth and women's empowerment from various perspectives. Numerous studies reveal that irrigation is crucial for agricultural growth. Accessibility, availability and utilisation of government schemes are also crucial. Literature shows the importance of soil and water conservation and water resource management for sustainable agricultural growth.

Chapter-3

Overview of Corporate Social Responsibility and Theoretical Framework

3.1 Introduction

As defined earlier, corporate social responsibility (CSR) is the ethical obligation of business towards the society to contribute positively and create positive societal good. The concept globally has seen significant evolution. It has moved from philanthropy to a stakeholder benefit approach. The movement was driven by a shift from a focus on profit maximisation to a more holistic approach, integrating social and environmental considerations. As this shift was happening, contemporary leading thinkers attempted to theorise CSR. Scholars like Frederick (1960), Friedman (1962), Carroll (1999) and others have played a significant role in this. Among these, the theoretical frameworks surrounding CSR, such as Carroll's Pyramid of CSR, emphasise a layered approach where companies first meet their economic responsibilities, and follow philanthropic obligations. These frameworks provide a structure to understand the varying layers of CSR and how businesses balance or can balance stakeholders' interests. CSR spending has grown because of legal rules and the understanding that businesses affect the society. Companies are now more aware of their social responsibility. Now CSR is a key part of business strategy, connecting profits with helping the society. Companies see it as a way to do good while earning money.

3.2 Corporate Social Responsibility Globally

The nineteenth century saw the rapid expansion of the East India Company in India. The industrial revolution that quickly spread throughout Europe and the rest of the world established the fundamentals of corporate social responsibility. In the UK, evolving capitalism has been practised for more than 150 years. The Cadburys, Rowntrees, and Hersheys are examples of Quaker families that have worked to improve their communities and the quality of life for their employees (John, 2005). In the eighteenth century, Adam Smith's model promoted the free exchange of ideas between individuals and businesses. He emphasised minimal restrictions in the economy. He believed that when people acted in their interest, it helped the society as a whole. However, he also saw that the free market wasn't always perfect. He stressed that honesty and fairness were important. These ideas highlighted the need for a balanced approach. (John, 2005).

During the nineteenth century, business executives played a significant role in shaping the society and local communities by contributing to developing infrastructure, colleges and

schools. In cities such as Manchester, Bombay, New York and Sydney, they contributed financially to public facilities like symphony halls and libraries. (Marcus and O'Connor, 2005). Driven by moral obligations and social investment, the leaders established the foundation for corporate philanthropic activity and community service. (John H., 2005). However, a similar period witnessed the rise of communism and its discontent with the capitalist approach towards the society. Communism and later on socialism aimed to replace the capitalists with state-run entitlements, social services and public control of production.

Beginning in 1917, governments across the globe - excluding the United States - took steps to regulate, thereby subjecting economic power to the state. (Marcus and O'Connor, 2005). Early proponents of this shift included chief executive officers and other corporate executives from large automotive, telecommunications and oil and energy firms. (Frederick, W., 2006). In developed nations, the nineteenth-century practice did not wholly vanish with the advent of welfare states. Despite the advent of welfare states in developed nations, the philanthropy of the nineteenth century did not completely vanish. In light of this history, scholars have attempted to define corporate social responsibility (CSR) and related words such as corporate citizenship, corporate social responsiveness, and corporate social performance since the 1950s (Bowen, 1953; Wood and Jones, 1995). The complexity of the concept is attributed to the varying conceptualisation and terminology associated with it. The origins of CSR can be traced back to the 1930s when A.A. Berle and E. Merrick Dodd debated the role of managers (Post, 2003). Two contrasting reasons have historically supported this practice. Wealthy manufacturers were expected to donate to charities because the moral imperative - often articulated by religious organisations - was that people in power and riches should assist those who do not have them (Saboji, 2011). There was also a social investment component as businesses stood to benefit from having prestigious universities, technical institutes and schools. For instance, business executives often established schools with strong corporate support (Saboji, 2011).

In the subsequent years, numerous scholars contributed to the theory of CSR. Bowen defines CSR as the ethical obligation to seek policies and practices that uphold societal values and objectives. (Maignan & Ferrell, 2004). His approach to company responsibilities, encompassing stakeholder's theory, corporate citizenship, social audit, responsiveness and stewardship, marked the beginning of the modern literature on CSR (Windsor, 2001). Social responsibility is a public attitude towards the society's financial and human resources that is open to using them for broader social goals (Frederick, 1960). The idea of CSR extends beyond

financial considerations since companies are required to uphold and enhance social order (Walton, 1967). Another facet of CSR that attracted attention was Milton Friedman's minimalist perspective on CSR (Lucas et al., 2001) and his famous comment in 1970 (Hopkins, 2003; Turner, 2006). The 1980s saw a more responsible approach to corporate strategy with R. Edward Freeman's work on the emerging Stakeholder's Theory. He identified stakeholders (including shareholders) as relevant to a firm's operations and identified four components of CSR: economic, legal, ethical and discretionary (Lucas et al., 2001; Post, 2003; Windsor, 2001).

Although the concept of corporate social responsibility (CSR) was not significantly expanded in the literature of the 1990s, it was used as a foundation for a wide range of related concepts and subjects, many of which complemented and aligned with CSR thinking. The main subjects that took center stage were corporate citizenship, business ethics theory, stakeholder theory and corporate social performance (Carroll, 1999). The literature evolved to explore related concepts further. The focus of shareholder activism shifted from ethics to the more conventional concerns of profitability, risk and shareholder value due to the connection between environmental or social issues, financial performance and the hazards businesses face. As enterprises strengthen, a once-considered domain of governments is now included in social responsibility (O'Rourke, 2003). In Carroll's view (1999), CSR will remain a fundamental component of business discourse and practice since it forms the basis for various other theories and continuously aligns with what the general public expects from the business community today.

3.3 Corporate Social Responsibility in Europe

Although it originated in the USA, CSR has developed significant literature in the UK. Since American companies pioneered the concept, procedures, social audits and corporate code of conduct, the USA is considered the leader in CSR. (Carroll, 1999; Hopkins, 2003). Global CSR dialogue is being actively advanced and promoted by governments, non-governmental groups and corporate associations in other European nations (Perrini et al., 2004). Besides, the 1980s witnessed a shift towards a more responsible approach to corporate strategy with R. Edward Freeman's work on the emerging Stakeholders' Theory. Freeman identified stakeholders (including shareholders) as relevant to a firm's operations and identified four components of CSR: economic, legal, ethical and discretionary (Freeman & Edward, 1984). The 1990s saw the literature broaden the definition of CSR. However, the authors used the

concept to explore related ideas and themes such as Corporate Social Performance (CSP), stakeholders' theory, business ethics theory and corporate citizenship. As global concerns about corporate responsibility grew, discussions around stakeholders' priorities increased. This led to questioning whether policymakers should adopt a flexible, multi-stakeholder approach. Such an approach could better promote CSR. Shareholder activists connected environmental or social issues to financial performance and risks firms face, shifting their focus from ethical concerns to traditional matters of profitability, risk management and shareholders' value (Tschopp, 2005). As corporations grow in capacity, their scope of social responsibility has broadened to include areas previously thought to be the responsibility of governments.

A significant occasion in the development of CSR was the European Summit in Lisbon in 2000, followed by the European Union Commission's Green Paper in 2001. The CSR EMS Forum and the European Business Campaign, 2005 on CSR were established to promote CSR. A majority of European states have backed the initiative. However, CSR agenda varies nationally, shaped by socio-political contexts, traditions and cultural values. For instance, whereas Germany prioritises education and training, UK embraces community projects and public-private collaboration.

3.4 Corporate Social Responsibility in Asia

Globally CSR has developed in diverse ways. Asia's economy is experiencing the most rapid growth. Since the social compact, which establishes the link between a company and the society, inevitably leads to CSR, this is unsurprising (ASIA Company Council, 2008). CSR has gained roots in Asia despite its origins in the western world (Mohan, 2001; Moon, 2002). Organisations, trade unions and regulators have initiated actions to improve the social and environmental performance of large corporations, affiliates and suppliers. International organizations, trade unions, human rights groups, lobbyists and regulators have taken various actions (Kemp, 2001). Over time, the idea of CSR has become popular in Asia. Many groups have worked to promote it and the concept has steadily gained support in the region.

3.5 Development of Corporate Social Responsibility in India

CSR has been a longstanding practice in India for centuries and many different viewpoints have shaped it. It traces its origins to ancient times when the concept of dharma emphasized moral duty. Philanthropy by wealthy individuals, merchants and rulers played a crucial role in uplifting communities, as seen in their patronage of art, education and healthcare. Hinduism and Sikhism are among the religions that have endorsed the idea of CSR. A

fundamental component of Hindu ceremonies is the belief in dharma or salvation. At the same time, Sikhism offers free langar, food and shelter in the gurudwaras (Suresh & Shankar, 2020). India's CSR history is categorised into four stages, each aligning with the country's historical evolution and producing various CSR strategies. However, the properties of one phase may overlap with those of another and the phases are not static.

3.5.1 First phase: CSR is driven by philanthropy and charity

CSR is a charitable and philanthropic initiative influenced by industrialization, family customs, religion and culture. It impacts community development and was first derived from corporate self-regulation. In ancient India, merchants dedicated themselves to the community for religious purposes, constructing temples and offering aid in times of need such as famines or epidemics. Even now, CSR procedures are influenced by these practices (Arora, 2004). Industrial families in India such as Tatas, Birlas, Godrejs and Singhanias were known for their inclination towards charity and social considerations. They focused on building knowledge capital and contributing to social activities globally. The ideology of CSR in the 1950s was based on the obligation of businesses to the society (Gautam and Singh, 2010). Initially, there was less documentation of CSR initiatives in India. Nevertheless, there has been a growing realisation of the importance of contributing to social activities and improving the environment since then (Shinde, 2005; Borgohain, 2013). These merchants also contributed to the society during famines and epidemics by offering food and financial assistance. There are multiple examples of corporate houses in pre-independence India participating in charitable initiatives.

3.5.2 Second phase: CSR and social development

Mahatma Gandhi's principle of trusteeship and the struggle for independence had an impact on the second stage (1914–1960) of Indian CSR (Mohan, 2001). Indian business saw economic growth as a way to rebel against colonial control. Indian companies actively participated in the reform movement by contributing to institutional and social advancement. The vision of a modern, free India drove their involvement (Das, 2016). Indian industries were encouraged to actively participate in the development of society during the independence movement. Gandhi introduced trusteeship which required wealth management for the common benefit (Mohan, 2001). Companies like those of Tatas and Birlas championed nation-building, empowering women and rural development through CSR initiatives. Gandhi instituted trusteeship to create modern Indian temples, prioritising the community's interests. Family enterprises made trusts for research institutes, training facilities, colleges and schools. (Mohan

2001). This resulted in socioeconomic growth consistent with Gandhi's reform initiatives which aimed to end untouchability, empower women and advance rural areas. He also created the concept of trusteeship to turn businesses become the temples of modern-day India. Businesses, particularly family enterprises, set up research and training facilities and founded trusts for colleges and universities (Mohan, 2001). This period emphasised managing business entities as trusts held in the community's interest, prompting many family-run businesses to contribute toward socioeconomic development (Arora, 2004).

3.5.3 Third phase: CSR within the mixed economy framework

The third era of CSR (1960–1980) was characterized by the mixed economy. The emergence of public sector undertakings (PSUs) and stringent legislative requirements defined the third era. Since the private sector was considered the main force behind development, laws about labour, governance, environment and corporate malpractices were passed. The state created PSUs to provide resources for the poor, but they were unsuccessful in achieving this goal. As a result of these changing expectations, the private sector began to participate actively in socioeconomic growth. A national CSR workshop was held in 1965 by Indian academics, legislators and businesspeople, focusing on stakeholders' engagement, transparency and social accountability. Moving from corporate self-regulation to stringent legal and public regulation of business operations signified India's move from a mixed economy to a public sector. The era of the 1960s is considered the era of "command and control". The private sector was subject to stringent legislative constraints. Corporate governance, labour and environmental issues became political agenda owing to the limitations placed on the private sector by high taxes, quotas and license system. To guarantee the redistribution of wealth to the poor, the state formed PSUs (Arora, 2004). Nonetheless, the public sector's efficacy was constrained by its inability to address developmental issues which raised expectations for the private sector and needed its participation in socioeconomic development (Mohan, 2001).

3.5.4 Fourth phase: CSR as an interface between corporate and philanthropic approaches

Since the fourth phase (1980 onwards), Indian companies have shifted from traditional CSR engagement to a sustainable business strategy. In the 1990s, globalisation and economic liberalisation began, eliminating controls and licensing systems (Gajare, 2014). This increased growth momentum which has helped Indian companies contribute to social causes. Globalisation has made India a significant destination for TNCs' production and manufacturing bases. Indian businesses exporting to the developed world are required to comply with

international standards as western markets are placing more importance on labor and environmental standards in developing countries. The Indian government adopted reforms during the 1990s to liberalize and deregulate the economy and incorporate it into the international marketplace. This led to growth even though philanthropic contributions remained. As businesses became more profitable, the public and government had higher expectations for them, and they were also more ready and able to give (Arora, 2004).

3.5.5 Current state of Corporate Social Responsibility in India

In the fourth phase (1980 onwards Indian companies have increasingly adopted a sustainable business strategy while incorporating CSR into their core operations. This shift has been driven by globalisation and economic liberalisation, which have reduced controls and licensing systems. Indian businesses must follow international norms as western customers increasingly worry about labour and environmental concerns in emerging nations (Garg, 2014). Traditional philanthropy gave way to more direct corporate involvement in mainstream development and care for underprivileged groups in the final ten years of the 20th century (Mohan, 2001). An ideal CSR should consider ethical and philosophical dimensions, considering the vast income and socioeconomic disparities (Bajpai, 2001). CSR has gained popularity since many Indian executives concur that companies have obligations to their suppliers, consumers, shareholders, employees, society and government (Shohreh, 2011).

3.6 Theoretical framework

An approach refers to a methodical way of dealing with problems. It encompasses a range of approaches and strategies that direct decision-making in many fields (Bryman, 2015). Depending on the situation and type of problem, approaches might be mixed methods, qualitative or quantitative (Creswell, 2014). On the other hand, a theoretical framework acts as a basis for organising theories and concepts to clarify and address specific problems (Grant & Osanloo, 2014). It offers a methodical framework for evaluating intricate issues (Eisenhardt, 1989). Stakeholders' theory (Freeman, 1984) and Carroll's CSR pyramid (Carroll, 1991), for instance, assist companies in coordinating their social and ethical responsibilities with their business goals in the context of CSR.

3.6.1 Theoretical framework of CSR

Multiple scholars have attempted to theorise CSR due to a range of theories. As per the economy's needs, one or two strategies must be employed to promote economic growth. There

is no singular CSR theory as it is an evolving process with strategies that adapt and change over time. These methods may vary periodically and from context to context.

3.6.1.1 CSR Pyramid Theory

Carroll's CSR Pyramid is a framework that lists the four societal responsibilities that firms have. First, economic responsibility requires generating revenue to ensure the continuation of a corporation. This is accomplished through long-term financial plans with multiple stakeholders, corporate operations, marketing plans and investments. According to the Win-Win hypothesis, a company's financial responsibility is positively impacted by its earnings which enhances money circulation and promotes successful CSR. Legal responsibility is the second tier of the CSR pyramid and it entails businesses abiding by rules and laws. A responsible corporation follows fair business practices because it benefits the society and economy. Businesses that manufacture harmful products, evade taxes or launder money are not considered CSR-compliant. Ethical responsibility entails upholding social values and fair business procedures, and associations and civil groups set moral standards. Philanthropic duty refers to a company's practices that are voluntary though not legally mandatory. Corporations develop these initiatives to meet community expectations and advance society. The objective is to enhance a company's reputation and image of good citizenship (Carroll, 1991). Carroll's Pyramid advises businesses to implement CSR initiatives sequentially, beginning with financial goals such as sustainability and profitability, then acknowledging moral principles and charitable obligations to the environment and society.

3.6.1.2 Triple Bottom Line

The Triple Bottom Line (TBL) notion of CSR was put forth by Elkington (1998). The economic, social and environmental facets of performance are highlighted in this paradigm. Its primary goal is to produce sustainable results that enable companies to produce recurring income and long-term social and environmental initiatives. Multiple firms and NGOs have adopted the TBL sustainability framework for their CSR initiatives. A company must consider the economic aspect to generate steady earnings over the long haul. Businesses can attain long-term financial success by figuring out expenses and taxes, predicting aspects of the company environment, assessing market standards and avoiding risks (Slaper & Hall, 2011). Businesses must consider their social and financial affairs to meet the social dimension. They must get information from national authorities on female labour force participation, human rights, unemployment rates, health care and education. The environmental aspect is essential for a

business's long-term viability and the standard of living for coming generations. Companies can make the best long-term decisions by overcoming obstacles in implementing TBL.

3.6.1.3 Stakeholders' Theory

Stakeholders are individuals or groups who can influence or benefit from an organisation's objectives. Edward Freeman highlights their significance in a corporation. The theory suggests that objectives can only be achieved by protecting and balancing the interests of diverse groups (Freeman, 2010). It has been used to characterize the nature of a firm, management and board directors' perspectives on corporate constituencies (Brenner, 1991). It also identifies the connection between stakeholders' management and the CSR approach. To apply this theory, corporations should involve all stakeholders in their boards of directors, ensuring that each stakeholder is represented and aligned with the corporation's goals (Suresh & Shankar, 2020).

3.6.2 Theoretical framework of village development

After independence, India's rural development efforts have changed. The country has adopted both decentralised and centralised planning to support social justice and rural growth. The goal of these changes is to cut down on waste and inefficiency. By focusing on these strategies, India aims to improve rural areas. This shift helps in better resource management. The goal of the Broad Front Approach was to address rural issues on all crucial fronts at once to improve the living standards of rural citizens. In 1952, the Community Development Programme (CDP) was established to address rural issues and improve the quality of life of rural citizens. Agricultural activities, cottage industries, cooperatives, education, health, sanitation, safe drinking water and economic infrastructure are a part of the CDP's focus. With active engagement, the CDP seeks to raise the standard of living of the rural community.

3.6.2.1 Sectoral approach: In India the sectoral approach to development concentrates on specific areas such as infrastructural development, housing, health care and education. This compartmentalised strategy has flaws. The Intensive Agricultural Development Programme (1960) and the Agricultural Area Programme (1963) are examples of this approach.

3.6.2.2 Participatory approach: This approach gives local people a say in planning and using funds for development. It uses their knowledge to choose what projects are needed. It also helps build local resources and skills. This strategy helps manage natural resources better. It supports

poor communities in using their resources more effectively. This strategy's primary focus is on creating resources and skill development.

3.6.2.3 Basic needs approach: This Approach focuses on ensuring a minimum standard of living for the poor. It includes rights, participation, jobs, justice and basic services. The goal is to make sure everyone has what he needs to live with dignity. It sees development as more than just economic growth. India's Minimum Needs Programme (MNP), started in 1974, is a key example. It aimed to provide essential services like housing, health and education.

3.6.2.4 Integrated development approach: Rural development focuses on reducing poverty, illiteracy, poor health and unfair land distribution. It also aims to stop exploitation and improve living conditions in rural areas. It includes several aspects of rural life including agriculture, industrialisation, education, sanitation, health, public works, social security, poverty alleviation and job initiatives. The Growth Centre Approach promotes equitable access to infrastructure, services and local administration such as training centres. Community development gives power to local groups to manage the development work. They control resources and make key decisions. This helps them improve their lives with the proper support and information.

3.6.2.5 Sustainable rural development approach: Meeting present needs without compromising the capacity of future generations to fulfil their own needs is known as sustainable development. Its main goal is to balance the economy, society, and environment. Since most poor people live in rural areas, this approach is crucial. It helps protect nature while boosting local incomes and living standards. Sustainable development also plays a key role in ending poverty. Coordinating rural development projects at the global, regional, national and local levels is vital. Strategies that offer focused approaches should consider the potential and remoteness of rural areas.

3.6.3 Theoretical framework of agricultural development

3.6.3.1 Sustainable agriculture:

Sustainable agriculture focuses on good food quality, high yields and protecting the environment. It also ensures that farming can adapt to changes and support future needs. Brown (1987) highlights the need to protect nature, grow efficiently, earn enough and meet food demands. (Altieri 1987) emphasises the capacity of an agroecosystem to sustain production throughout time, as well as ecological and socioeconomic restrictions. Sustainable agricultural development involves optimising crop and animal genotypes and environmental conditions,

managing and conserving natural resources, and encouraging institutional and technical changes to meet human requirements for both the present and future generations (FAO, 1988).

The concept of agricultural sustainability should include the enhancement of genotypes, alongside a deeper understanding of ecological and agronomic management practices (Pretty, 2002). An integrated system of plant and animal production techniques known as "sustainable agriculture" aims to fulfil the demands of people for food and fibre while also enhancing the environment, making effective use of non-renewable resources, maintaining farm operations, and improving the standard of living for both farmers and society at large. The FAO (2014) outlines five principles for food and agricultural sustainability: increasing resource efficiency, preserving and strengthening natural resources, safeguarding rural livelihoods, boosting resilience, and establishing responsible governance systems. Furthermore, a sustainable agricultural system that supports resource management, fosters ecosystems and guarantees global food security cannot be achieved with the current production systems and policies (FAO, 2015).

3.6.3.2 Aspects of sustainable agriculture

Sustainable agriculture includes economic, environmental and social aspects. These three areas are closely connected and support each other. Economic activities affect both nature and people's well-being. For true sustainability, all they must work together. Indicators are developed based on these pillars to track progress. Economic profit alone can't cover the environmental and social costs of farming. Researchers around the world are studying these important factors. Dipak, C. (2021) also highlights this concern.

- **Economic aspects of sustainable agriculture**

Key economic concerns in agriculture include net income, production costs and productivity. These factors help measure how financially sustainable farming is. Long-term economic viability, defined by productivity, stability, liquidity and profitability factors, is essential for the farming community. Productivity is measured by the ratio of output to input, and quantitative measures of profitability and productivity are commonly used. Autonomy, a social indicator, predicts long-term economic viability in agriculture (Dipak C., 2021).

- **Environmental aspect of sustainable agriculture**

Sustainable agriculture looks at environmental factors like clean water, soil health and fewer greenhouse gases. It promotes using renewable resources to protect nature. It also seeks to support wildlife and preserve natural habitats. Management strategies promote soil fertility,

such as nitrogen-fixing legumes, green manure, animal dung and reduced tillage. (Dipak C. 2021).

- **Social aspects of sustainable agriculture**

Social sustainability in farming focuses on two key areas. First, it looks at farmers' well-being through education, work conditions and living standards. Second, it values good farming methods and product quality. These are often judged through farmers' surveys and group discussions. Both aim to ensure long-term support for rural communities (Dipak C., 2021).

3.6.3.3 Approaches of sustainable agricultural development

Sustainable agriculture has different approaches. The ecocentric approach supports slow, low-growth development. It promotes biodynamic and organic farming methods. The goal is to use resources responsibly and reduce harm to nature. Another crucial perspective is that technocentric perspectives propose state-led industrial system reforms, such as conservation-oriented farming methods and several sustainability techniques such as biotechnology to meet growing food demands. The multi-functional agriculture approach underscores farm-centred practices and defines functions as outcomes of agricultural activities, encompassing functions beyond food and fibre production. An ecosystem service-centred strategy (Lkerd, 1993) integrates ecosystem services like pollination, soil formation and nutrient cycling with sustainable agriculture, focusing on biodiversity, landscape protection and management of renewable resources. Many people argue that agroecology, an ecosystem-based approach, is the best way to achieve sustainable agriculture. Expanding employment, income, and material goods and services seeks to improve human well-being under the assumption of a more excellent standard of living (Lkerd, 1993). Three fundamental tactics for sustainable development are synthesis, integration and diversification. Entire systems possess attributes and traits not present in their constituent pieces (Lkerd, 1993). Sustainability in post-industrial agriculture necessitates a systems approach that emphasizes the knowledge-based growth of entire farms and communities. At the same time, the component method, which concentrates on individual farming practices, may be appropriate for agricultural industrialisation (Lkerd, 1993).

3.6.4 Theoretical framework of women's empowerment

Women's economic empowerment means giving them the tools and opportunities to earn, own and decide. It is the key to gender equality and inclusive growth. Empowered women can improve their lives and support their families. They gain access to resources, jobs and decision-

making roles. This helps communities and boosts development. Different theories help explain how empowerment works and what blocks it. Globally, it is seen as vital for lasting progress.

- **Feminist Economics**

Feminist Economics highlights the importance of valuing women's work, both paid and unpaid. It criticizes traditional economics for ignoring the challenges women face in the workforce. Feminist economists call for sharing unpaid care work, closing the gender pay gap and giving women more access to financial resources (Elson, 1995). They believe that economic empowerment is not just about earning money, but also changing social rules and power imbalances that keep women unequal.

- **Capability approach**

The capability approach (Sen, 1999) emphasizes expanding women's freedoms and abilities to live the life they choose. It highlights the importance of providing opportunities for them to achieve their goals and well-being. In this framework, economic empowerment goes beyond income or employment; it is about expanding women's choices and opportunities to engage in and benefit from economic activities. This approach highlights the need for access to education, healthcare and social protection as enablers of economic empowerment (Sen, 1999).

- **Gender and Development (GAD) Theory**

The Gender and Development (GAD) theory focuses on breaking down barriers that limit women's empowerment. It sees women not as passive recipients but as active participants in change. GAD works to address gender inequalities in policies and society. It recognizes women as important drivers of development. GAD advocates for policies that tackle unequal access to resources like credit and land. It also highlights the role of factors like class, ethnicity and location in shaping women's economic opportunities. The approach emphasizes gender-sensitive solutions (Rathgeber, 1990).

- **Structural and institutional approaches**

Structural theories examine the macroeconomic and institutional factors that shape women's economic empowerment. They include policies related to labour markets, trade and social protection. Institutions like the International Labour Organisation (ILO) stress the importance of inclusive labour markets, equal pay and reducing workplace discrimination. Structural approaches focus on addressing barriers like access to education, childcare and legal protection. These measures support women's economic participation (World Bank, 2014).

3.7 Summary

The study uses the above theories to understand what affects women's economic empowerment. It looks at how large-scale economic factors, institutions and society influence women's roles. The theories help analyze the challenges women face in economic development. It gives a complete view of the issues women encounter. These insights help create better strategies for promoting women's economic empowerment.

Chapter- 4

Research Methodology and Profile of the Studied Area

4.1 Research methodology

This study adopted a descriptive case study approach using primary and secondary data. The study employed quantitative and qualitative research methods, including the PSM method to achieve the research objectives.⁶ It selected a few treated and control villages for analysis. The sample villages and families in both groups were chosen to have comparable features to efficiently compare the treatment and control groups. Within each taluka, the study included all treatment and control villages with the closest prioritisation score to each treatment village. Village-level and household-level surveys were conducted as part of the study (Bernadette & Roldan, 2013).

Two interview schedules were used: one focused on women's empowerment and the other on agricultural growth. The structured interview schedules included open- and closed-ended questions to help household respondents comprehensively address the research objectives. Many village stakeholders were interviewed, including Sarpanchs, JBGVS village-level officers and office-level officers actively implementing CSR initiatives at the village level. The study examined the women's empowerment index to identify the factors influencing women's empowerment in Indian communities. Data were collected from female respondents on their decision-making process, ability to work independently, awareness of various issues and overall attitude towards life (Sabina et al., 2013; Vaijyanthi, 2002; Rogers et al., 1998). Women's households in CSR and non-CSR villages provided the original data. CSR women's households were categorised into two groups: those receiving direct and indirect benefits.

A cross-sectional study was employed to collect the primary data from 2021 to 2022. Given budgetary and scheduling constraints, cross-sectional data collection and analysis were used instead of longitudinal research methods. An exploratory study approach has been adopted to create a case summary diagnosis based on the goal. Therefore, combining case studies with cross-sectional research methods proved effective in achieving the research objectives and demonstrating the impact of CSR. Key data for the study were gathered in the Chhatrapati

⁶ 1. Handbook on Impact Evaluation –The World Bank 2. Impact Evaluation In Practice –The World Bank 3. Impact Evaluation Report on the ARMM Social Fund for Peace and Development Project (The Philippines)-Japan International Cooperation Agency.

Sambhajinagar district of Maharashtra using structured interview schedules. Village development is a comprehensive concept, and JBGVS plays a crucial role in advancing initiatives like soil and water conservation, water resource management and women’s empowerment. Therefore, for this study we have focused on the following rural development variables/interventions in the selected villages :

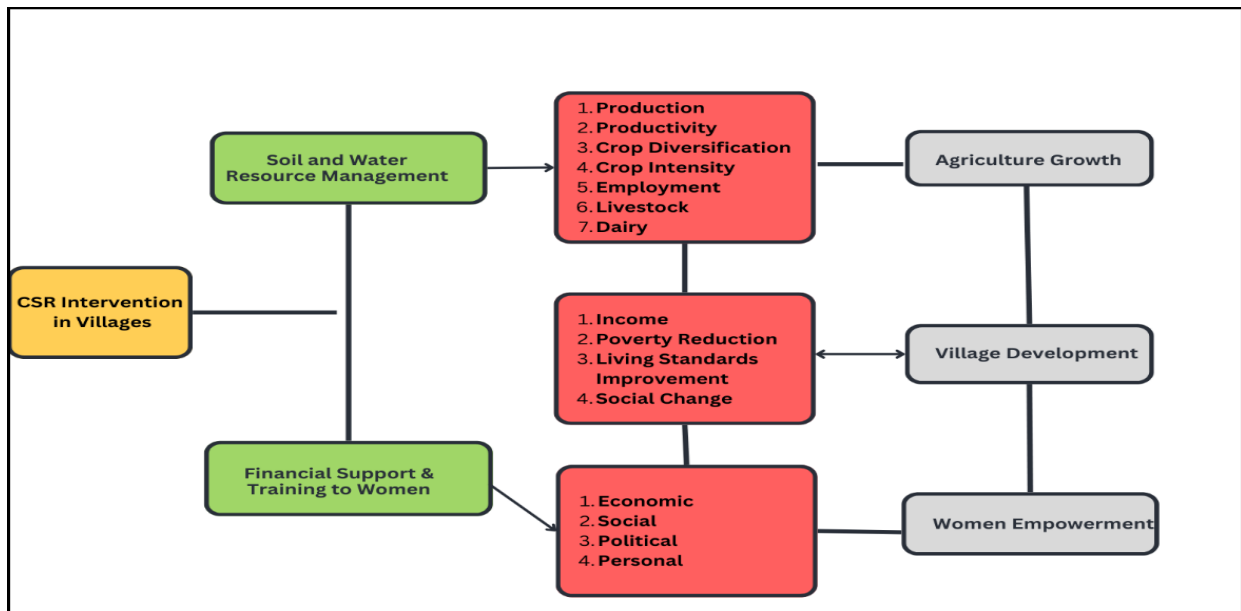
- Agricultural growth
- Women’s empowerment
- Usable and drinking water facilities

4.2 Research framework

Various factors impact agricultural growth and women's empowerment in villages.

Graph 4.1 shows how CSR intervention impacts.

Figure 4 1: Research framework

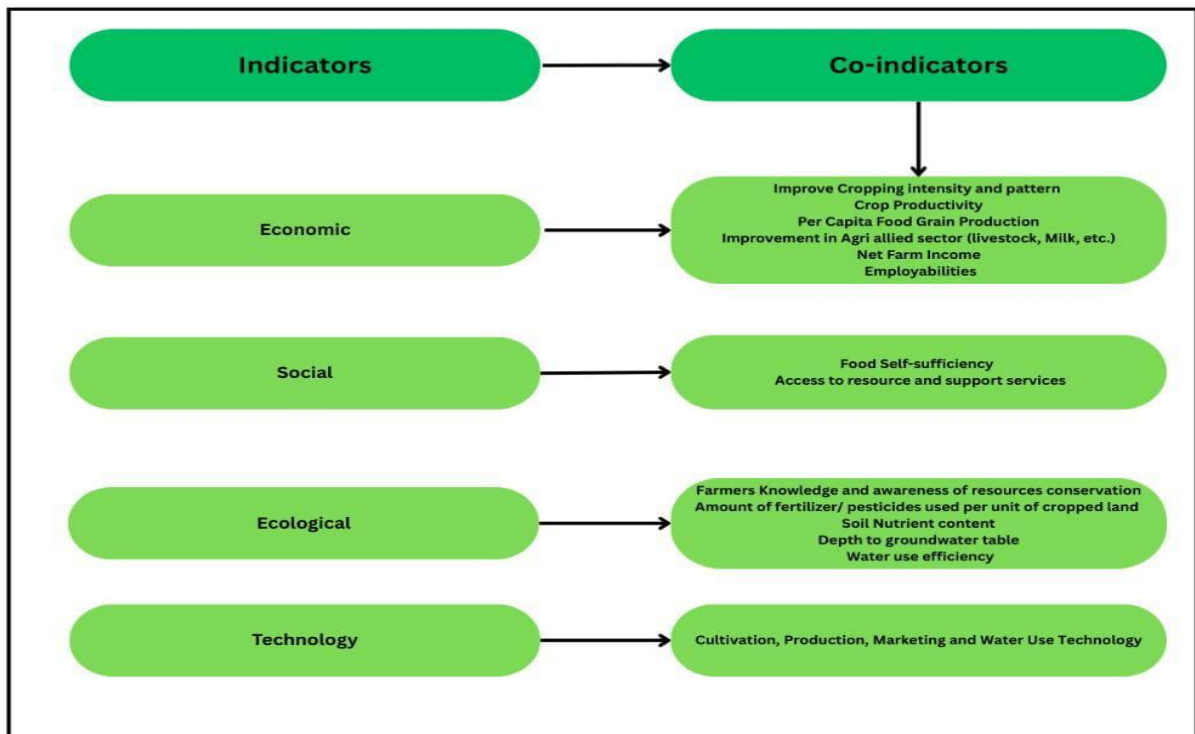


Source: Author’s creation based on the literature.

4.3 Agricultural growth and development indicators

Economic, social, ecological and technological indicators and co-indicators were considered to assess the impact of CSR on agricultural growth in the adopted villages.

Figure 4 2: Agricultural growth and development indicators

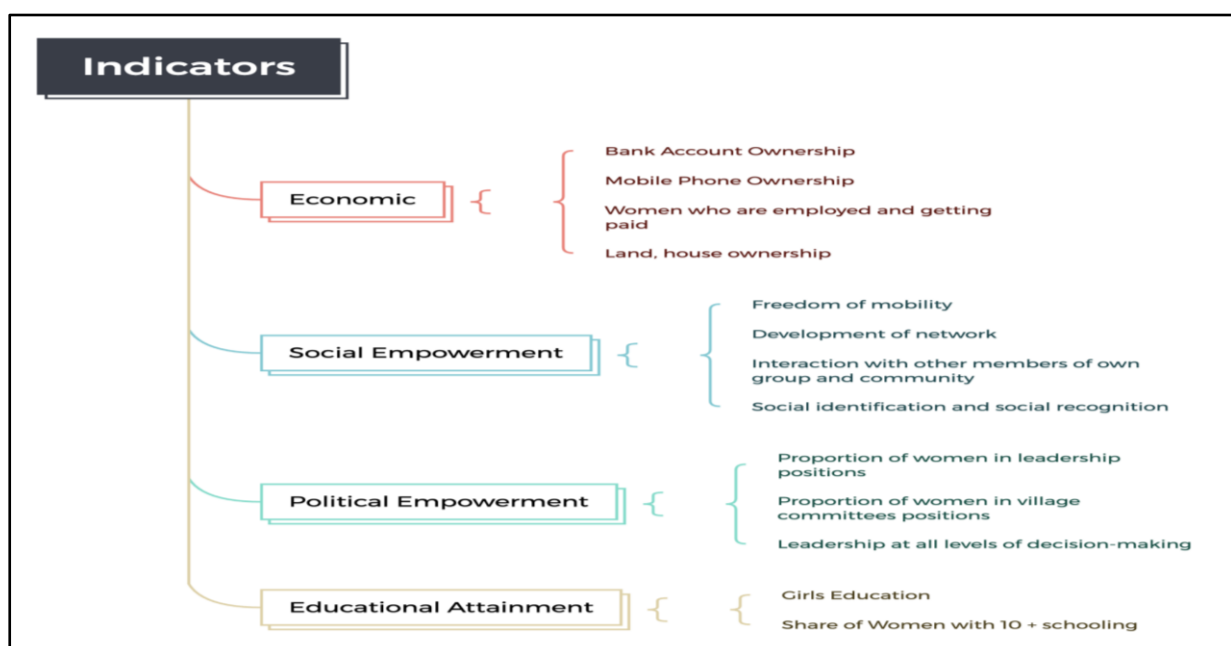


Source: Author’s creation based on Handbook on Rural Households’ Livelihood and Well-being, FAO, UN (2007).

4.4 Women's empowerment indicators

Similarly, the effect of CSR on women's empowerment in the chosen villages was assessed using economic, social, political, and educational variables and co-indicators.

Figure 4 3: Women’s empowerment indicators



Source: Author's creation based on Women's Empowerment in Rural Community Driven Development Projects, World Bank (2017), NFHS-5 India (2021), A Practical Guide to Measuring Women's and Girls' Empowerment in Impact Evaluations J-PAL (2018) and Women's Empowerment in Agriculture IFPRI, OPHI (2012).

4.5 Data sources

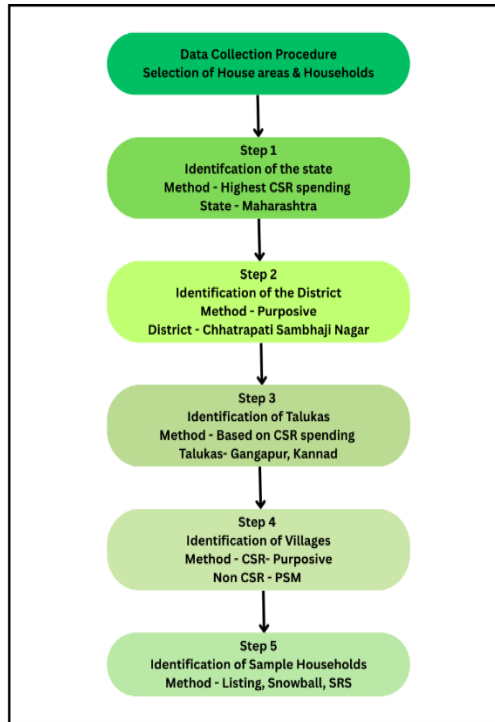
The study utilised secondary data from multiple sources to satisfy the first objective, i.e., to analyse the trends and patterns of CSR expenditure incurred by firms from 2014-15 to 2021-22. Key data was drawn from the Ministry of Corporate Affairs, India, along with other comprehensive sources such as CMIE, Census of 2011 and FICCI. Secondary data sources were used to understand sector-wise, state-wise and district-wise CSR spending. The period covered was from 2014-15 to 2021-22. Additionally, the study referred to reports from the World Bank, impact evaluation reports, and the Ministry of Agriculture's annual reports. More specific documents such as the Detailed Project Report (DPR) 2017-21 (JBGVS) and the Participatory Rural Appraisal (PRA) Report-2017(JBGVS), were also consulted. For the second and third objectives, the study assesses the impact of CSR activity on agricultural growth and women's empowerment. Primary surveys were conducted for farmers (both male and female) and female respondents representing both CSR and non-CSR population from villages in the Chhatrapati Sambhajnagar district. The study used primary data to identify the impact of CSR on agricultural growth such as production, productivity, crop diversification, crop intensity and change in cropping pattern. It is also used to determine the impact of CSR activities on women's empowerment including economic, social, political and personal variables. For the third objective, interviews were carried out with the village head, CSR implementing officers and FGD in the villages in CSR villages to identify the problems while implementing CSR.

4.6 Selection procedure for the studied area and households

Figure 4.4 illustrates the selection process for the studied area and households conducted in five steps. In the first step, the state was selected. Maharashtra, being the state with the highest CSR spending, was chosen. In the second step, a district was selected. Most CSR sending for rural development were in the Pune district during sampling selection., Bajaj Group had the highest CSR pending on rural development. Jankidevi Bajaj Gram Vikas Sanstha (JBGVS), a CSR-focused organisation based in Akurdi, Pune, was identified in the next step. JBGVS has adopted 110 villages under its rural development initiatives. Since these villages are located in Chhatrapati Sambhajnagar district, the latter was selected for the study to ensure a focused and relevant analysis of CSR impact on rural development. In the third

phase, the taluka was selected. JBGVS adopted 110 villages of Chhatrapati Sambhajnagar. So, Gangapur and Kannada talukas were selected. These talukas are adjacent to each other, and JBGVS has adopted more than 100 villages in the Gangapur taluka.

Figure 4 4: Studied area and households



Source: Author’s creation based on the literature.

In the fourth phase, villages (CSR and non-CSR) were selected. CSR villages were selected using a purposive method. In contrast, the PSM (Propensity Score Matching) method was adopted to select non-CSR villages. For the PSM method, seven variables were used to match non-CSR villages with CSR villages for the control treatment method. Households were selected by simple random sampling method in the fifth step.

4.6.1 Selection of villages

- **CSR villages (Treated): Selection**

JBGVS adopted 110 villages for rural development under the Bajaj Water Conservation Project (BWCP) 2016-17 for five years in the Chhatrapati Sambhajnagar district. Among these, three of the 110 villages have completed their work, and work in the other villages was ongoing while data was being collected. Therefore, we selected three adopted (CSR / treated villages/) and three non-adopted villages (non-CSR/control villages).

- **Non-CSR (controlled) villages: Selection**

The propensity score matching method (PSM) was used to select the control villages.⁷ Treatment villages had CSR interventions, while control villages were those without CSR interventions. For the household-level analysis, there was no baseline data available from before the research, and it only depended on the current cross-sectional data. One of the key evaluation methods using cross-sectional data is PSM, which compares treatment and control groups with similar characteristics regarding the probability of participation in the research (i.e., propensity score). Using early matching estimators, each unit in the treatment group was paired individually with a unit from the comparison group. When PSM is used, the case in the comparison group that is most similar to each treated instance is that the two would be partnered in terms of propensity. $Y_1^i - Y_0^j(i)$ is the actual programme impact for a given treated case i , where $Y_0^j(i)$ is the result for the comparison case corresponding to treated case i . The expected programme impact was calculated for this difference across all treated cases. To accomplish this pairwise matching, sampling from the comparison group was typically done without replacement, allowing each member to be included as a matched case only once (Carolyn et al., 2010).

Observed characteristics of X as $P(X) = Pr(T = 1 | X)$, the ATET of PSM was defined as

$$\beta_{PSM} = E_{P(X)|T=1}\{E[Y^T | T = 1, P(X)] - E[Y^C | T = 0, P(X)]\},$$

or more specifically,

$$\beta_{PSM} = \frac{1}{N_T} [\sum_{i \in T} Y_i^T - \sum_{j \in C} \omega(i, j) Y_j^C],$$

The propensity score was determined based on the observed characteristics of X , where N_T represents the number of villages in the treatment group and $w(i, j)$ is the weight used to combine outcomes from the matched control villages. The weight was defined differently depending on the choice of the matching algorithm.

- **Propensity Score Matching (PSM)**

We adopted the nearest-neighbour matching approach, where each treatment village was matched to the control village with the closest propensity score. In Table 4.1, 38 villages from Chhatrapati Sambhajnagar district and 07 variables are considered for the villages' matching purpose, ensuring a robust matching process. Ten were CSR villages and 28 were non-CSR

⁷ Impact Evaluation Report on the ARMM Social Fund for Peace and Development Project (The Philippines)-Japan International Cooperation Agency (2016).

villages. For the study, three CSR and three non-CSR villages were selected from these groups.

The following variables were considered for village matching:

1. Total households
2. Total geographical area (in hectares)
3. Total population of village
4. Sex ratio
5. Sub district headquarters (distance in km)
6. Net area sown (in hectares)
7. Area irrigated by source (in hectares)

Table 4 1: Propensity Score Matching (PSM)

Distance Matrix for Propensity Score Matching										
(CSR Treatment Villages vs. Non-CSR Control Villages)										
CSR /non-CSR villages	Lasur gaon	Matega on	Chamb harwadi	Vitkh eda	Deoli	Deolana	Tad Pimpalg aon	Shankarpu r	Mahebu bkheda	Akoli Wadg aon
Dinwada	1.213	0.520	1.888	0.525	0.396	2.082	1.892	0.151	2.744	1.644
Maliwadgaon	0.630	0.062	1.306	1.108	0.186	1.500	1.31	0.431	2.162	1.061
Derhal	1.048	0.355	1.723	0.69	0.231	1.917	1.727	0.014	2.579	1.479
Kinhal	1.721	1.029	2.397	0.017	0.904	2.591	2.401	0.660	3.253	2.152
Raipur	2.057	1.365	2.733	0.319	1.241	2.927	2.737	0.996	3.589	2.488
Padalsa	0.790	0.097	1.465	0.948	0.027	1.659	1.469	0.272	2.321	1.221
Babhulgaon	1.189	0.496	1.864	0.549	0.372	2.058	1.868	0.127	2.720	1.620
Vairagad	1.497	0.804	2.172	0.241	0.680	2.366	2.176	0.435	3.028	1.928
Pimpalgaon	1.751	1.059	2.426	0.013	0.934	2.621	2.430	0.689	3.283	2.182
Diwashi	7.904	7.212	8.579	6.166	7.087	8.774	8.583	6.842	9.436	8.335

Source: Author's calculations based on the census of India, 2011.

A 95% confidence interval was used for village matching, providing a high level of confidence in the study's findings. The study included all treatment and control villages within each taluka, with the nearest prioritisation score assigned to each treatment village.

Table 4 2: Matched villages

Matched villages				
Treatment villages	Logit (propensity score)	Control villages	Logit (propensity score)	Distances
Dinwada	0.359	Shankarpur	0.208	0.151
Maliwadgaon	-0.223	Mategaon	-0.161	0.062
Derhal	0.194	Deoli	-0.036	0.231
Kinhal	0.868	Vitkheda	0.885	0.017
Raipur	1.204	Lasurgaon	-0.853	2.057
Padalsa	-0.064	Akoli Wadgaon	-1.284	1.221
Babhulgaon	0.335	Chambharwadi	-1.529	1.864
Vairagad	0.643	Tad Pimpalgaon	-1.533	2.176
Pimpalgaon	0.897	Deolana	-1.723	2.621
Diwashi	7.050	Mahebubkheda	-2.385	9.436

Source: Author's calculation based on the Census of India, 2011.

In Table 4.2 treatment villages display the logit-transformed propensity score for villages in the treatment group. In contrast, control villages represent the logit-transformed propensity score for villages in the control group. The distance represents the absolute difference in propensity scores between treated and control villages. A lower distance indicates that the treated and control units are more similar based on propensity scores.

Dinwada and Shankarpur are relatively close in terms of propensity scores, with a slight difference of 0.151 in their propensity scores (Dinwada: 0.359 vs. Shankarpur: 0.208, distance: 0.151). Similarly, Maliwadgaon and Mategaon show a minimal difference of 0.062 in their propensity scores, suggesting they are well-matched. On the other hand, Pimpalgaon and Deolana are close to each other with a difference of 2.621 in their propensity scores (Pimpalgaon: 0.897 vs. Deolana: -1.723, distance: 2.621). That suggests that they are matched. Diwashi and Mahebubkheda are poorly matched, with the largest difference in propensity scores (Diwashi: 7.050 vs. Mahebubkheda: -2.385, distance: 9.436). This significant difference in propensity scores is for them, where the difference is 9.436. This is a poor match and indicates that the treated and controlled individuals are dissimilar in their characteristics. This could be problematic when estimating the treatment effect. For this study, we selected well-matched villages:

1. Dinwada and Shankarpur
2. Maliwadgaon and Mategaon
3. Pimpalgaon and Deolana

These were chosen as the three matched groups of villages. Dinwada, Maliwadgaon, and Mategaon are CSR (treatment) villages, and Shankarpur, Mategaon, and Pimpalgaon are non-CSR (control) villages.

4.7 Sample design

The pilot study (field visit) involved meeting all panchayat officers and JBGVS officers to understand the data sufficiency for the sample collection. The proportion to population size method has been used for household sampling selection (Holmes, 2015; N. Salkind, 2010; A. Delice, 2010). Two types of households, CSR village households and non-CSR village households, have been surveyed to identify the impact of CSR on village development. This sample is subdivided into two parts based on agricultural development and women's empowerment variables.

Table 4 3: Sample design

Type of village	Villages	Total households (as per Census, 2011)	Sample households for agricultural growth (male & female)	Sample households for women's empowerment (female)	Total
CSR villages	Dinwada	195	43	22	274
	Maliwadgaon	565	112	38	
	Pimpalgaon	237	39	20	
Non-CSR villages	Shankarpur	225	50	21	248
	Mategaon	277	50	23	
	Deolana	414	68	36	
Total households		1913	362	160	522

Source: Author's calculation based on the Census of India, 2011.

Our study involved a rigorous selection process, with 194 farmer households from CSR villages and 168 from non-CSR villages carefully chosen to identify the impact of CSR on agricultural development. Eighty women households from CSR villages and another 80 from non-CSR villages were selected to determine the effect of CSR on women's empowerment. Of 80 women from CSR villages, 40 have directly benefited from the CSR activity. A total of 522 households were selected for a sample from 1913 households, nearly 27.28 per cent of the total households.

4.7.1 Sampling and type of farmers

Table 4.4 is for the sampling division to ensure a similar proportion of CSR and non-CSR village samples.

Table 4 4: Sampling and type of farmers

Type of village/ type of farmers	CSR-villages		Non-CSR villages	
	No. of farmers	Farmers (%)	No. of farmers	Farmers (%)
Marginal farmers	56	28.9	49	29.2
Small farmers	72	37.1	63	37.5
Semi-medium farmers	55	28.4	46	27.4
Medium farmers	10	5.2	9	5.4
Large farmers	1	0.5	1	0.6
Total	194	100.0	168	100.0

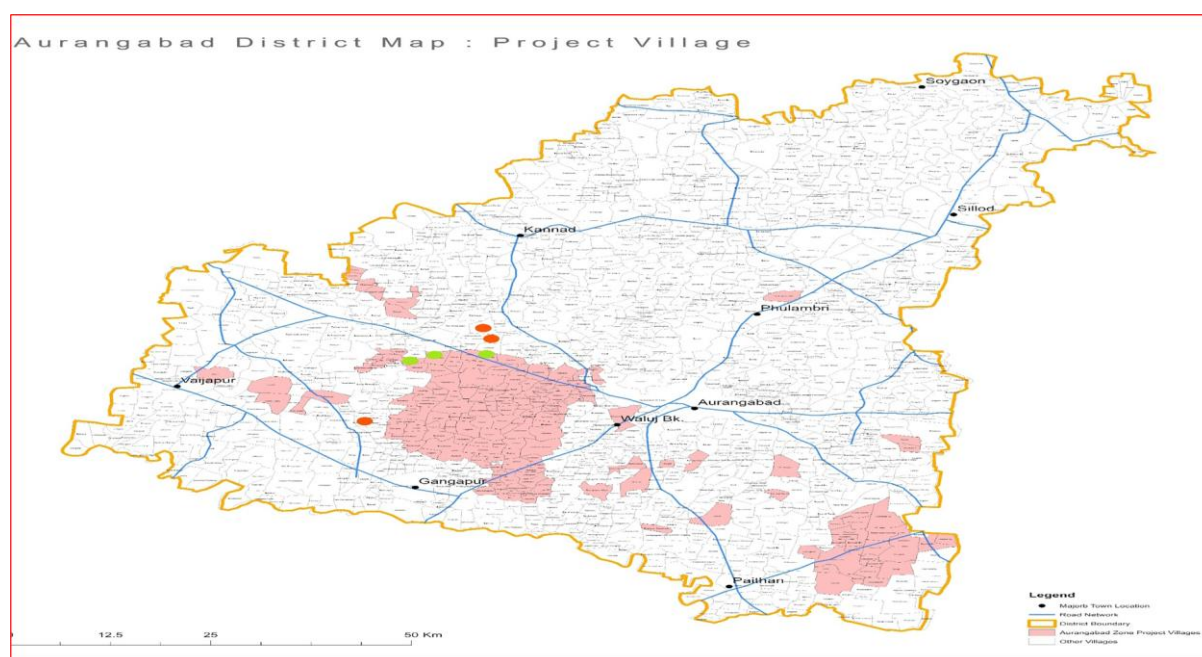
Source: Author's calculation based on sample data.

Due to certain limitations, we could not collect the same proportion of data from each village. However, we could collect near or equal the ratio (marginal farmers, small farmers, semi-medium farmers, medium farmers and large farmers) of CSR and non-CSR villages.

4.7.2 CSR village map

JBGVS has adopted 110 villages in Chhatrapati Sambhaji Nagar. The study has 11 clusters, each consisting of 10 villages. JBGVS has adopted villages for five years.

Map 4 1: CSR village map



Source: JBGVS, 2021.

The work of the first three villages (Maliwadgaon, Dinwada and Pimpalgaon) was completed during my research. For this study, we selected three CSR villages as a treatment group and another three non-CSR villages as a control group, ensuring a comprehensive and balanced approach to the research. The non-CSR villages are those where no organisation has undertaken CSR activities or spending. JBGVS adopts the 110 villages shown in pink on the map above. The three villages shown in green are CSR villages and have been taken for the study, while the villages shown in red are non-CSR control villages and have been selected for analysis.

4.7.3 Conditions for selecting sampling units

As shown in Figure 4.4, the selection process followed a hierarchical order: state → district → taluka → villages → households. While selecting each household the simple random method has been adopted. The study focused on two key development variables: agricultural growth and women's empowerment with two different sample groups:

1. Agricultural development - 362 samples (both male and female respondents), and
2. Women's empowerment - 160 samples (female respondents only).

The characteristics of non-CSR households, such as household type (joint or nuclear), closely resemble those of CSR households. In addition, the landholding size of the non-CSR households is more or less similar to that of the CSR village households. Although the proportion of samples from both CSR and non-CSR villages was kept equal, the sample selection conditions differed for the control and treatment groups.

4.7.3.1 Selection of sample households for agricultural growth

Samples were selected from both CSR and non-CSR villages. However, the conditions for selecting farmer respondents were different in both villages.

I. Conditions for selecting the sample units for agricultural development

(treatment group):

- Sample households must have land-holding ownership.
- In CSR villages, the sample households were selected based on whether they had benefited directly or indirectly from CSR activities in the village.

II. Conditions for selecting the sample units for agriculture development (control group):

- Sample households must possess land-holding ownership.

4.7.3.2 Selection of sample households for women's empowerment

Samples were selected from both CSR and non-CSR villages. However, conditions for selecting women respondents were different in both villages.

I Conditions for selecting the sample unit for CSR village households (treatment group):

- Women should be members of SHGs.
- The sample household should have benefited directly or indirectly from CSR activities in the village.

II The conditions for choosing the sample units for women's empowerment (treatment group):

- The sample households should be members of SHGs.

4.7.3.3 Conditions for selecting the sample unit for the usable/ drinking water facility:

- Selected households (agricultural development and women's empowerment) were considered for this section.

When selecting the sample units from the studied area, households that did not meet the criteria for the CSR and non-CSR groups were excluded. As a result, it is one of the study's sample selection issues.

4.7.4 Calculation of sample size

The study adopted a systematic approach to finalise the sample size for CSR and non-CSR households. The procedure of sample selection is mentioned below. The total household size of the selected six villages is approximately 1,913. The proportion to population method has been used to calculate sample households (Schoereder et al., 2004; Rosenberger et al., 2021). The sample size formula was applied to select the required sample size based on the total households. The sampling calculation was based on the following formula:

The correct mathematical notation for the sample size formula should be written as:

$$\text{Sample size} = \frac{Z^2 * P(1-P)}{e^2} \div \left(1 + \frac{Z^2 * P(1-P)}{e^2 N}\right)$$

Or, more clearly:

$$\text{Sample size} = \frac{Z^2 * P(1-P)}{e^2} / \left(1 + \frac{Z^2 * P(1-P)}{e^2 N}\right)$$

Alternatively, in a more readable fraction format:

$$\text{Sample size} = \frac{Z^2 * P(1-P)}{e^2 + \frac{Z^2 * P(1-P)}{N}}$$

Where, N = population size, z = z-score, e = margin of error, p = standard of deviation

For the calculation, population N=1913, Z=Confidence level (Z) 95% (Z value 1.96), P (SD, Proportion) 0.5, and Margin error (e) 0.05 were considered. A total of 1,913 households were considered for the sample calculation. The minimum recommendation sample for members per the above formula is 320 with a 5 per cent margin of error. However, the survey selected a larger sample of 522 households to ensure comprehensive coverage. This included:

1. 362 households for the agricultural development study.
2. 160 households for the women's empowerment study.

The 362 farmer households were proportionally divided between CSR and non-CSR villages based on the population proportion. Within CSR and non-CSR villages, farmers were selected based on land size. They are proportionally equal. For the women's empowerment study, the 160 chosen households represent nearly 10 per cent of the total CSR and non-CSR households, providing a balanced and representative sample.

4.8 Tools used

The study employed various statistical tools to analyse both primary and secondary data, including Multiple Regression Analysis, Independent Samples T-test, F-test in One-Way ANOVA, One-Sample Z-test for Proportion, Indicators, Chi-Square Test and Independent Samples Mann-Whitney U Test. Additionally, the study used technical tools such as MS Excel, Gretl, PSPP, XL-Stata, and QGIS for data analysis and visualisation.

4.9 Duration of interview

The interview included both closed- and open-ended questions. The significance of open-ended questions in the overall study led to their thorough listing in the questionnaire. Each sample household took 50 minutes to one hour to finish the structured questionnaire. All the required information was collected from the household respondents and each participant answered the questions. Data has been gathered from a variety of stakeholders (farmers, women and village sarpanch) for village-level drinking water and usable amenities, women's empowerment and agricultural growth. Almost every question was incorporated in the final analysis.

4.10 Data editing and entering process

The questionnaires were reviewed and updated on the interview day. It is to ensure that they were clear and complete, capturing all relevant information. Any misplaced content, differences or data errors were carefully checked and corrected. These revisions were essential

for preparing the data for analysis. Once the data was collected, it was ready for further processing. PSPP and Gretl software were then used to analyze the data from Excel. This process ensured the data was accurate and suitable for drawing meaningful conclusions.

4.11 Concepts used

The research analyzed agricultural development and women's empowerment concepts to assess CSR's impact. The findings highlight key effects on both areas.

- **Crop intensity**

It refers to raising several crops from the same field during one agricultural year.

- **The cropping intensity index**

It measures how cropping intensity has changed from a base year to a specific year for a crop.

Cropping Intensity Index = (cropping intensity in the current year/cropping intensity in the base year) * 100

- **Crop diversity**

Crop diversification refers to growing multiple crops on the same piece of land. Horizontal diversification adds crops to the current cropping system, primary type and widely accepted idea. Crop diversification includes, for example, producing different kinds of other crops in uplands or cultivating field crops in rice fields. Nevertheless, this kind of crop diversification entails expanding the system's base by adding additional crops to the current cropping system using strategies like multiple cropping in conjunction with other effective management techniques (FAO, 2001).

- **Cropping pattern**

It refers to the arrangement and combination of different crops in a specific area, taking into account farming practices, market demand, soil characteristics, climate and water availability.

- **Gross cropped area**

It is the total area sown to crops and orchards once or more a year, including the net-sown area.

- **Gross irrigated area**

The area irrigated under various crops during a year includes the total irrigated area, where the same land is counted multiple times if it is irrigated for more than one crop in the same year.

4.12 Socio-economic profile of Chhatrapati Sambhajnagar district

This study examines the historical, geographical, demographic and agricultural features of the Chhatrapati Sambhajnagar district. It aims to offer a comprehensive understanding of the district and explores its key characteristics to highlight its unique aspects.

4.12.1 Historical significance

Chhatrapati Sambhajnagar has a historical background. It was a prosperous city in ancient times. Its ancient cave area witnessed development along with Pitalkhora, Ajanta and Verul which were then known as Rajtadag. This city was developed in the time of Malik Amber who was the wazir of Nizamshahi kingdom. His son Fateh Khan conquered the city and named it Fatehnagar, after which it was included in the Mughal Empire. Aurangzeb stayed here twice as a subedar and changed the name of Fatehnagar to Aurangabad in 1653. The government changed the name of Aurangabad city to Chhatrapati Sambhaji Nagar on September 15, 2023. It is rich in archaeological and architectural remains. The colourful paintings in the interior of Ajanta Caves dates back to the 4th century BC. The capital of Satavahana kingdom, Pratishtan, is present-day Paithan. It had become a major centre of the silk industry. Built-in the eight centuries, it has beautiful sculptures in the Verul caves. The Devagiri fort at Daulatabad, built by King Bhilama Yadav in 1187 AD, is considered a masterpiece of Asian architecture. Daulatabad was the capital of India for a short period during the reign of Mohammad Tughlaq. Chhatrapati Sambhaji Nagar district was part of the Qutubshahi kingdom till the Mughals conquered it. In 1956 Marathwada was separated from Hyderabad state and merged with the Bombay state. Verul and Ajanta have been recognised as two world heritage sites by UNESCO. The government changed the name of Aurangabad city to Chhatrapati Sambhajnagar on September 15, 2023.⁸

4.12.2 Geographical information:

Chhatrapati Sambhajnagar district is located in the north-central part of Maharashtra. It is spread in 11°18 to 20°40 northern latitude and 74°34 to 76°04 eastern longitude. It is located in the centre of Maharashtra. Most of this district is in the Godavari Valley. The slope of the district is generally to the south and east, and the north lies in the southern plateau. Its east-west length is about 201 kilometres, and the north-south length 161 kms. The southern part of the district is generally 520 to 575 mtr. above sea level, and some parts of the northern

⁸ DSA-Chhatrapati Sambhaji Nagar -2023-24.pdf

part are 600 to 670 mtr.⁹ The district's total area is 10136.61 sq. kms., which is 3.28 per cent of Maharashtra. Of this, 0.309,35 thousand sq. km. are in the urban division and 9.828 sq. km. in the rural area. The total cultivable area in the district is 1007475 hectares, which is 99.97 per cent of the total area. According to the recommendations of the Sukhtankar Committee, Chhatrapati Sambhajnagar, Gangapur, Kannad, Paithan, Khultabad and Vaijapur talukas of this district have been included in the drought-prone zone. It has an area of 75.52 sq. km and is 74.72% of the total area.¹⁰

Map 4 2: Chhatrapati Sambhajnagar district map



Source: <https://chhatrapatiSambhajiNagar.maharashtra.gov.in/en/map-of-district/>

- **Geology**

Most of the district is composed of igneous rock, limestone of medium age and varying depths and different layers. The land in some areas of Soygaon, Kannad, Khultabad and Sillod tehsils is light. Land on the banks of the Godavari river in Vaijapur, Gangapur, and Paithan talukas is deep black and fertile.

- **Rivers**

Chhatrapati Sambhajnagar district falls in the Godavari and Tapi River valleys. Other rivers except the Waghoor River in the Tapi Valley of the district are minor. Godavari River is the main river in the district, originating at Trimbakeshwar in the Nashik district and entering Vaijapur tehsil in the Chhatrapati Sambhajnagar district. The Purna Shivana Kham Dudhna,

⁹ Directorate of Economics and Statistics.

¹⁰ Directorate of Economics and Statistics.

Gulati Girja, etc., are tributaries of Godavari. Most of them originate from the hills of Kannad tehsil and usually dry up in summer.

- **Weather and precipitation**

There are three parts of the year in terms of weather. From June to September, the air is normal, but due to the rains it is a bit cold. From October to February, the air is dry and cold. October is sunny during the day, but the air is a little cold from evening to morning. From November to January there is an occasional cold wave. The district's weather is hot and dry from March to May. The temperature in the second fortnight of April increases. Agriculture is the main occupation of the people and agriculture depends on rain. However, the rain scanty and not timely and regular, causing an occasional drought. The district received an average of 749 mm of rainfall in 2023, with Soygaon taluka recording the highest rainfall at 890.9 mm compared with significantly less rainfall in Vaijapur taluka at 587.2 mm.

4.12.3 Agriculture:

- **Types of land**

The land in the northern taluka of the district is light and dry, while the southern characteristics of Godavari Kachi land are deep black, and the city supplementary is fertile and good. Although crops are grown in both the kharif and rabi seasons in the district, in several areas, the soil depth extends several meters, but water availability is limited.

- **Forests**

The district has a total forest area of 782.34 sq. kms. from 2000 to 2023–24, but the forest cover in many areas is of low quality. Considering the total geographical area of the district, the forest area is 7.72 per cent, while the area under forest cover should be 33 per cent. The Department of Forestry and Socialisation is making efforts to increase the cover (National Forest Policy, 1998).

- **Crops and cropping systems**

In the district crops are grown in the kharif and rabi seasons. The main crops include hybrid jowar, bajra, tur, urad, cotton, kutkudi and groundnut, while sugarcane and banana are significant perennial crops. Additionally, in summer the district has a total cultivated area of 1,24,237 hectares with cereals on 3,52,349 hectares, cotton on 1,10,347 hectares and sugarcane on 3,19,180 hectares.

4.12.4. Animal husbandry, veterinary and dairy resources

The district has a total livestock population of 11.64 lakh (20th Livestock Census, 2019). Its cattle population is 539,000, buffalo population 94,000, cows 131,000, buffaloes

38,000, goats 431,000 (typically sold for slaughter around one year old), sheep 88,000, and chickens 580,000. There are 440 dairy cooperative societies with a membership of 2240. In 2023-24, these societies collected 32.955 lakh litres of milk.

4.12.5 Population of the district

According to the 2011 census, the district population was 37,01,282, out of which the rural population was 20,81,112 and urban population 16,20,170. The decadal growth rate was 27.76 per cent.

Table 4 5 : Population of Chhatrapati Sambhajnagar district

Sr. No.	Taluka	Total geographic area (in hectares)	Total villages	Total cities	Total male population	Total female population	Total population	Total households	Sex ratio	Projected population (1st Oct. 2021)
1	Kannad (Rural)	1496.27	211	-	156496	143764	300260	59680	919	317752
	Kannad (Urban)	4.5	-	1	21144	19615	40759	7707	928	49577
2	Soegaon (Rural)	653.74	85	-	58896	54191	113087	23566	920	119675
	Soegaon (Urban)	0	-	0	0	0	0	0	-	-
3	Sillod (Rural)	1153.74	131	-	156949	144784	301733	59545	922	319310
	Sillod (Urban)	35.83	-	1	30074	28156	58230	10973	936	70827
4	Phulambri (Rural)	718.78	92	-	83591	77421	161012	31550	926	170392
	Phulambri (Urban)	0	-	0	0	0	0	0	-	-
5	Chh. Sambhaji Nagar (Rural)	1129.82	185	-	147919	133349	281268	56131	902	297653
	Chh. Sambhaji Nagar (Urban)	176.56	-	5	681052	628054	1309106	267342	922	1592311
6	Khuldabad (Rural)	506.77	76	-	53113	49466	102579	20166	931	108555
	Khuldabad (Urban)	5.12	-	1	8112	7637	15749	2861	941	19156
7	Vaijapur (Rural)	1520.96	166	-	139583	130492	270075	56173	935	285803
	Vaijapur (Urban)	10.52	-	1	21243	20053	41296	8135	944	50230
8	Gangapur (Rural)	1235.63	221	-	132914	123254	256168	53003	927	271091
	Gangapur (Urban)	63.71	-	5	53643	48344	101987	23051	901	124050
9	Paithan (Rural)	1412.55	189	-	152364	142566	294930	61136	936	312111
	Paithan (Urban)	13.11	-	2	27376	25667	53043	10896	938	64518
	Total Rural	9828.26	1356	-	1081825	999287	2081112	420950	924	2202347
	Total Urban	309.35	-	16	842644	777526	1620170	330965	923	1970669

Source: Census 2011, India & Socio-economic survey-2024, Chhatrapati Sambhajnagar.

The area of the district is 3.29 per cent of the area of Maharashtra, and its population was 3.29 per cent of Maharashtra in 2011. The density of population in the district was 365

persons per sq. km. According to the 2011 census, Maharashtra has 929 females per 1000 males and the district has 923 females per 1000 males. According to the 2011 census, the district's overall literacy rate was 79.02 per cent while in Maharashtra it was 82.34 per cent. The literacy rate in Chhatrapati Sambhajinagar taluka was the highest at 85.03 per cent and the lowest at 70.57 per cent in Soegaon taluka in the district.

4.12.6 Tourism

The caves at Ajanta-Verul are among the World Heritage Sites. Daulatabad fort, Chhatri Chhatrapati Sambhajinagar caves, watermill, Bibi Ka Makbara, Sulibhanjan, Khuldabad, Pitalkhora, etc., are sightseeing sites. Similarly, Shri Grishneshwar Temple is the twelfth Jyotirlinga at Verul and Paithan has the samadhi of Shri Eknath Maharaj of Maharashtra. Paithani saree is famous too.¹¹

4.13 Profile of the selected villages

The selected villages comprise CSR villages of Dinwada, Maliwadgaon and Pimpalgaon, and non-CSR villages of Shankarpur, Mategaon. and Deolana. Dinwada, Maliwadgaon, Pimpalgaon and Shankarpur are in Gangapur taluka and Mategaon and Deolana in Kannad taluka of Chhatrapati Sambhajinagar district. The cluster of CSR villages is geographically situated between N19°56'34"-20'0" and E75'0"0"-75°08'38" on the state highway no. 30.¹²

4.13.1 Demography

The population of the project villages is 13270, distributed among 2611 households. Male: Female ratio is 934 and the average family size is five members. The population of scheduled caste households is 15 per cent and scheduled tribe households 7 per cent. (Table 2). The Maratha community is dominating with a total of 1274 households (49%) in the cluster, followed by 519 households of Mali, i.e., vegetable growers (20%), 389 Bauddha households, and 46 Muslim households. GIVE %. Dhangars (142 households) and Bhilla (176 households) are other communities. Dhangars are engaged in goat and sheep rearing. Bhilla is a landless caste dependent on wages from farm labour and brickwork. Marathas are farmers as well as small-scale traders. Buddhists are engaged as wage labourers on masonry work as well as on farms. Muslims are engaged in agriculture, dairy, transport lines and seasonal trading of vegetables like tomatoes and ginger. Of 2611 households, 656 (25%) are below the poverty level.

¹¹ DSA_Chhatrapati Sambhajinagar -2023-24.pdf

¹² Bajaj Water Conservation Project, Cluster No.7 DPR 2017-18, JBGVS.

Table 4 6 : Population of selected villages

Population of villages (Census of 2011)								
Village type	Village name	Total households	Total population	Total male population	Total female population	Total SC population	Total ST population	Sex ratio
CSR	Dinwada	195	914	479	435	39	31	908
	Maliwadgaon	565	2853	1464	1389	260	275	949
	Pimpalgaon	237	1142	580	562	229	28	969
Non-CSR	Shankarpur	225	1004	525	479	180	30	912
	Mategaon	277	1421	732	689	73	107	941
	Deolana	414	1973	1011	962	76	145	952
Grand Total		1913	9307	4791	4516	857	616	943

Source: Census of India, 2011.

4.13.2 Climate

This cluster area is located in the Deccan Plateau, Western Maharashtra scarcity agro-climatic region, and the Hot Semi-Arid Eco-Region. It is distinguished by hot summers and year-round dryness, except the southwestern monsoon season, which runs from June to September. The end of November marks the start of the winter season. The coldest month is December when the average high temperature is 28.9°C, and the average low temperature is 10.3°C. The hottest month is May, when the average high temperature is 41°C and the average low temperature is 24.6°C. By roughly the second week of June, the southwest monsoon had arrived and the temperature had significantly dropped.

4.13.3. Rainfall

Gangapur taluka suffers from low rainfall of less than 730 mm in less than 45 days which is uncertain and ill-distributed. Also, Kannada taluka suffers from little rainfall of 741 mm. The rainfall pattern is bimodal, i.e., there are two peaks of rainfall, first in June-July and second in September.¹³ Average annual rainfall for the decade 2007-2016 was 535 mm.¹⁴

4.13.4. Geography and land use

The entire project area is ten villages spread over 6389.18 ha. It is categorized as 510.27 ha as non-cultivated, 334.76 ha as cultivable wasteland and 5544.15 ha as under cultivation.

¹³ NIDM report-[https:// www.didm.in/PDF/DP/MAHARASHTRA.PDF](https://www.didm.in/PDF/DP/MAHARASHTRA.PDF)

¹⁴ Bajaj Water Conservation Project, Cluster No.7 DPR 2017-18, JBGVS.

Out of the cultivable area, 4840.54 ha is un-irrigated and only 703.61 ha (12.7%) has irrigation facilities (Table 4.6).

Table 4 7: Geography and land use

Agricultural land and irrigation details (Census of 2011)						
Village type	Village name	Net area sown (in hectares)	Total unirrigated land (in ha)	Area irrigated by source (in ha)	Canals irrigated area (in ha)	Wells/tube wells irrigated area (in ha)
CSR	Dinwada	447.81	131	316.81	0	131
	Maliwadgaon	606.48	32	574.48	0	32
	Pimpalgaon	587.88	45	542.88	0	45
Non-CSR	Shankarpur	303.09	36.4	266.69	0	36.4
	Mategaon	497	96	401	0	96
	Deolana	788.75	127	663.75	2	125
Total		3231.01	467.4	2765.61	2	465.4

Source: Census of 2011.

This table shows that CSR villages have fewer cultivated lands than non-CSR villages. The percentage of unirrigated land in CSR villages is higher than in non-CSR villages. In general, non-CSR communities have more irrigated land than CSR villages. In these villages, wells or tube wells irrigate most of the land. Non-CSR villages often have more irrigated and sown land than CSR villages. The primary source of irrigation is a well or tube well, while canals are utilised only in a few acres. While some villages still rely heavily on unirrigated land, others (especially in B Type) have large irrigated areas, suggesting better access to water resources.

4.14 Profile of Jankidevi Bajaj Gram Vikas Sanstha

4.14.1 History

The Jankidevi Bajaj Gram Vikas Sanstha (JBGVS), which was founded in 1987 and is named after Padma Vibhushan Jankideviji, is dedicated to bridging the gap between rural and urban India by emphasising on comprehensive rural development work that is in line with the Sustainable Development Goals of the UN, with a focus on economic, environmental, and social development as well as health and hygiene and education. Through JBGVS, Bajaj Auto and Bajaj Group carry out their CSR initiatives, especially in rural regions of Maharashtra, Rajasthan, and Uttarakhand, where they impact the lives of the underprivileged.

4.14.2 Integrated Rural Development Project

JBGVS works to carry out integrated rural development projects in over 350 villages in the districts of Sikar, Rajasthan; Udham Singh Nagar, Uttarakhand; and Chhatrapati

Sambhajinagar, Pune and Wardha, Maharashtra. The programmes are implemented with government agencies, other NGOs and villagers. JBGVS has developed 45 villages in the last 32 years.

4.14.3 Community development initiatives

Samaj Seva Kendra (SSK) carries social development initiatives in metropolitan areas. SSK's operations in Akurdi began in 1974. Peasants initially objected to SSK's activities, but eventually they became agreeable. Over time, SSK evolved into a hub for women and kids to interact, exchange stories, create and participate in various programmes.¹⁵

4.14.4 Environment

JBGVS runs the Bajaj Water Conservation Project (BWCP) in Marathwada and the drought-prone areas of Rajasthan and Uttarakhand in response to the increasing need to develop a water-efficient nation. With a total donation of Rs. 24 crores from the Bajaj Group, the first phase of the Bajaj Water Conservation Project (January 2015-December 2017) was initiated in 51 villages in Paithan, Gangapur Taluka, Chhatrapati Sambhajinagar district. In light of the community-led interventions, the communities also contributed Rs. 2 crores. The Bajaj Group provided a total of 199 crores to support the second phase of the Project which was implemented in 110 villages across Gangapur and Chhatrapati Sambhajinagar Talukas from December 2017 to March 2022. In Phase 2 of the project Rs. 46 crores were collected as community contribution (JBGVS, 2025).

4.14.5 Health

JBGVS has up to 150 partners, and its health programs are designed to meet community needs, support local partners, create sustainable models, and use knowledge from global partners to fortify regional alliances. (JBGVS, 2025).

4.14.6 Livelihood

With the help of its committed support systems and partners at different levels. Three interventions were created to accomplish this goal: 1) the career progression and skill development model, 2) the group enterprise model, and 3) the individual enterprise model.¹⁶ Career advancement, empowering impoverished individuals in rural and urban areas, mentoring support, inclusion and outcome-led designs, and capacity building-pre and post-employment assistance are the main focuses of JBGVS' livelihood programs.

¹⁵ <https://jbgvs.org.in/Whatwedo/>

¹⁶ <https://jbgvs.org.in/Whatwedo/#Livelihood>

4.14.7 Education

JBGVS started the BEI (Bajaj Education Initiatives) to enhance the quality of education in Pimpri-Chinchwad and Pune. It also runs night schools to promote holistic development. The "Night School Transformation Programme" provides 7000 adolescents in grades 6-10 in 14 ZP schools in Chhatrapati Sambhajnagar and Pune with holistic development and work-ready programmes catering to migrant and working-class population.¹⁷

4.14.8 Social

Samaj Seva Kendra (SSK) carries out social development initiatives in metropolitan areas. SSK began operations in Akurdi in 1974. Following their initial opposition, the locals started responding favorably to its operations. This views was taken into consideration when the SSKs in Wardha and Chhatrapati Sambhajnagar were established in 2011 and 2016, respectively. Wardha is the Karmabhoomi of the Bajaj family, where Jamanalal Bajaj dedicated his life to helping the poor and disadvantaged, and Bajaj Auto maintains a plant at Chhatrapati Sambhajnagar.

4.14.9 Activities of JBGVS under Bajaj Water Conservation Project

Being a CSR wing of Bajaj Auto Ltd, JBGVS has implemented a water conservation project under Jalyukta Shivar Abhiyan in 51 drought-affected villages in Gangapur, Paithan, Vaijapur, Aurangabad and Phulambri talukas of Chhatrapati Sambhajnagar district. Gaining from observations, it was realised that though development initiatives implemented by various agencies are supporting the project villages, communities are still struggling to get sufficient drinking water and to gain a sustainable livelihood. It was observed that the farming communities face higher vulnerabilities and challenges due to erratic and below-average monsoons, sudden climatic variations, etc. There is also a constant need to develop additional livelihood opportunities and enhance available livelihoods through livestock, better management of available water resources, empowering women and building local community-based institutions. Detailed potential mapping was conducted in the proposed villages to create a comprehensive four-year project report. The potential mapping is based on the participatory rural appraisal, discussion with villagers, technical surveys and measurements carried out by a team of social as well as technical experts. Existing situations regarding water conservation, water management, agriculture, livelihood patterns, land use, etc., have been analysed.

¹⁷ <https://jbgvs.org.in/Whatwedo/#Education>

4.15 Summary

This chapter covered the study's research and sampling strategy. A descriptive case study technique was developed with the use of a combined research method (qualitative and quantitative research strategy), which included the PSM. Structured and semi-structured schedules at the farm household level were the major data collection instruments. However, semi-structured interviews with other stakeholders and focus group discussions were used to build up the case study of both the CSR and non-CSR. In this chapter, the profile of the study district, villages and JBGVS is discussed.

Chapter-5

Current Status of CSR in India

5.1 Introduction

This chapter explores the current landscape of CSR spending by companies. The Indian government made CSR spending mandatory in December 2013 under the CSR Act 2013 which came into force on April 1, 2014. With this legislation, India became the first country in the world to enforce mandatory CSR contributions. The analysis of CSR spending in this study is conducted at the national, state and district levels, along with a sector-wise breakdown and a comparison between Public Sector Undertakings (PSUs) and non-PSUs. The study focuses on the period from 2014-15 to 2021-22, providing a comprehensive overview of CSR expenditure trends during these years.

This study also analyses CSR spending on rural development. The analysis concludes that CSR spending was higher in industrially developed states such as Maharashtra, Karnataka, Gujarat, etc. Sector-wise, CSR spending on education has benefited dramatically, followed by the health sector and rural development. These findings underscore the significance of CSR spending analysis, providing valuable insights for policymakers to consider development approaches while considering CSR spending in India. The study was also done district-wise in Maharashtra, giving us insights into CSR spending in industrially developed states.

5.2 CSR in India

Section 135 of the Companies' Act, 2013 (henceforth referred to as the "Act"), Schedule VII of the Act, and the Companies (CSR Policy) Rules, 2014, regulate the concept of corporate social responsibility (CSR) in India. These regulations establish criteria for evaluating a company's eligibility for CSR as well as for putting its CSR policies into practice and disclosing them. With one of the most intricate CSR frameworks and implementation strategies, India has begun to establish a standard for achieving sustainability objectives and enlisting stakeholders in national development. The scope of CSR is continuously expanding and in the coming years it will serve as a crucial knowledge base for assessing and accomplishing sustainability goals across numerous massive economies. India stands out as a nation that has made promises by enforcing CSR through legislation.¹⁸

¹⁸ <https://www.csr.gov.in/content/csr/global/master/home/aboutcsr/about-csr.html>

Table 5 1: CSR spending pattern and growth rate in India

Financial year	Amount spent (INR cr.)	Annual growth rate
2014-15	10065.93	0.00
2015-16	14517.21	44.22
2016-17	14542.51	0.17
2017-18	17098.57	17.58
2018-19	20217.65	18.24
2019-20	24965.82	23.49
2020-21	26210.95	4.99
2021-22	25932.79	-1.06
AAGR		15.4
CAGR		14.5

Source: Ministry of Corporate Affairs, India, 2025.

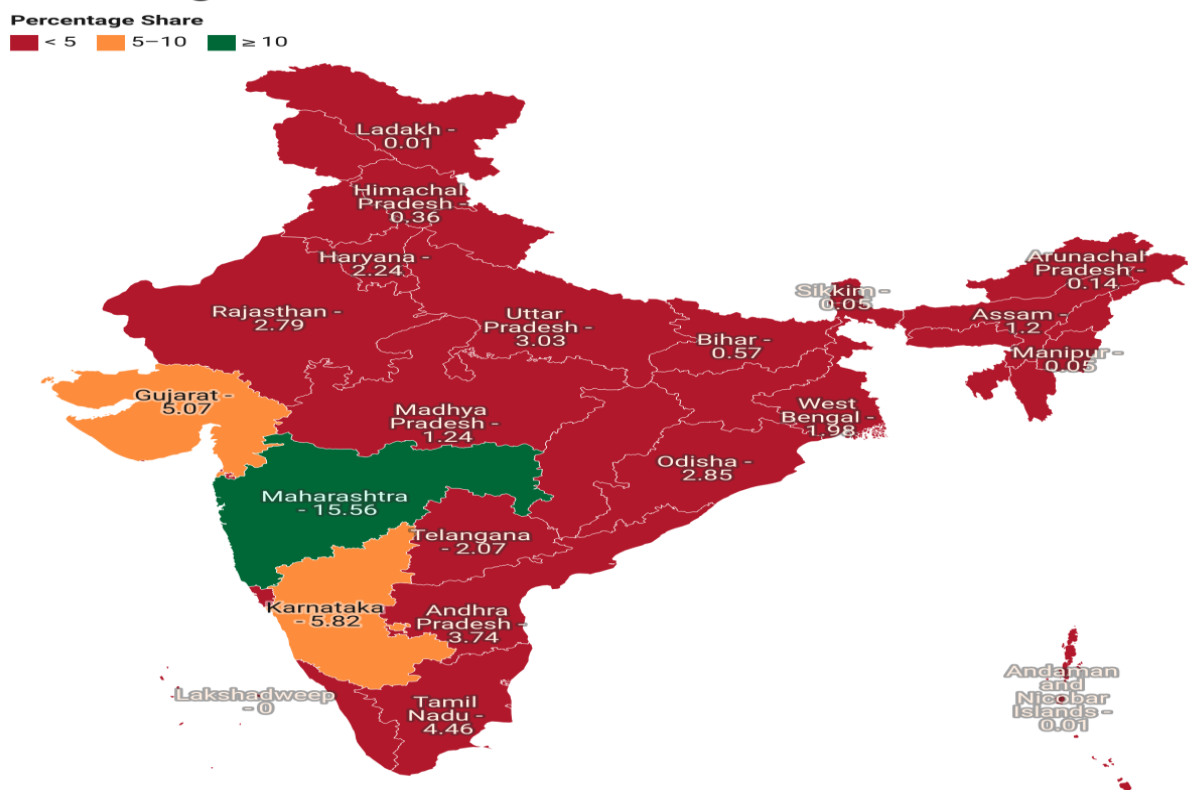
Table 5.1 provides a trend of CSR spending in India from 2014-15 to 2021-22. There is a general upward trend of CSR spending, though the amount allocated fluctuates over time. The year 2014-15 saw the lowest CSR spending (INR 10065.93 cr.). The expenditure peaked in 2020-21 and then declined in 2021-22 with the most significant amount (INR 26210.95 cr.). The annual growth rate of CSR spending from 2014-15 to 2021-22 fluctuated with a notable peak of 44.2 per cent in 2015-16 and a low of -1.06 per cent in 2021- 22. The decline in 2021-22 indicates a notable reduction in CSR expenditure compared to the previous year. Significant growth in CSR spending was observed in 2016-17 and 2017-18 with increases of 17.58 per cent and 18.24 per cent respectively. Despite being slower than 2017-18, the years 2018-19 and 2019-20 maintained the increasing trend. A sharp decline of 20.6 per cent in 2020-21 was likely to have been influenced by external economic factors (such as the effects of COVID-19). The Compound Annual Growth Rate (CAGR) represents the smoothed annual growth rate for the whole period. Despite annual fluctuations, the 14.5 per cent CAGR reflects strong overall growth in CSR spending. The CAGR is a more accurate measure of long-term financial performance. CSR spending has steadily risen, highlighting robust long-term economic growth with noticeable fluctuations even amid periodic variations. The above table shows that even if CSR spending steadily increases, the growth rates fluctuate. The average annual growth rate (AAGR) of CSR was 15.4 per cent, while the CAGR was 14.5 per cent from 2014-15 to 2021-22. The CSR spending growth rate was negative in 2021-22 due to COVID-19 which negatively impacted the industrial sector. This is reflected in the overall decline in CSR spending during that period. The continuous increase in CSR spending reflects the country's economic growth.

5.3 State-wise CSR expenditure in India during 2014-2022 (Percentage Share)

Today, public and private companies have integrated community development as one of the core objectives in their business strategies. On April 1, 2014, the rules established by Section 135 of the Companies' Act 2013 come into effect in India. CSR expenditure has steadily increased since 2014-15. State-wise CSR spending has shown significant variations since 2014-15. The primary objective of mandating CSR for companies is to focus on backward states and sectors through CSR activities. The following map shows state-wise CSR spending from 2014-15 to 2021-22.

Map 5 1: State-wise CSR expenditure in India, 2014-15 to 2021-22 (% share)

Percentage of CSR share in India



Map data: © OSM · Created with Datawrapper

Source: Author's calculation based on MCA, India, 2025.

Map 5.1 presents the percentage share of different states in India, showing an apparent disparity in the distribution of CSR spending. Maharashtra has the highest percentage of CSR spending at 15.56 per cent and the highest total CSR spending (23885.79 Cr. INR Rs.) from 2014-15 to 2021-22. As Maharashtra is industrially developed among all the states, possibly boasting the broadest industrial base or strongest economy. Karnataka has a 5.82 per cent share and total spending of (INR Rs. 8942.74 cr.), while Gujarat state has a 5.07 per cent share and expenditure of INR Rs. 7777.44 cr. Their expenditure is lower than by Maharashtra but still

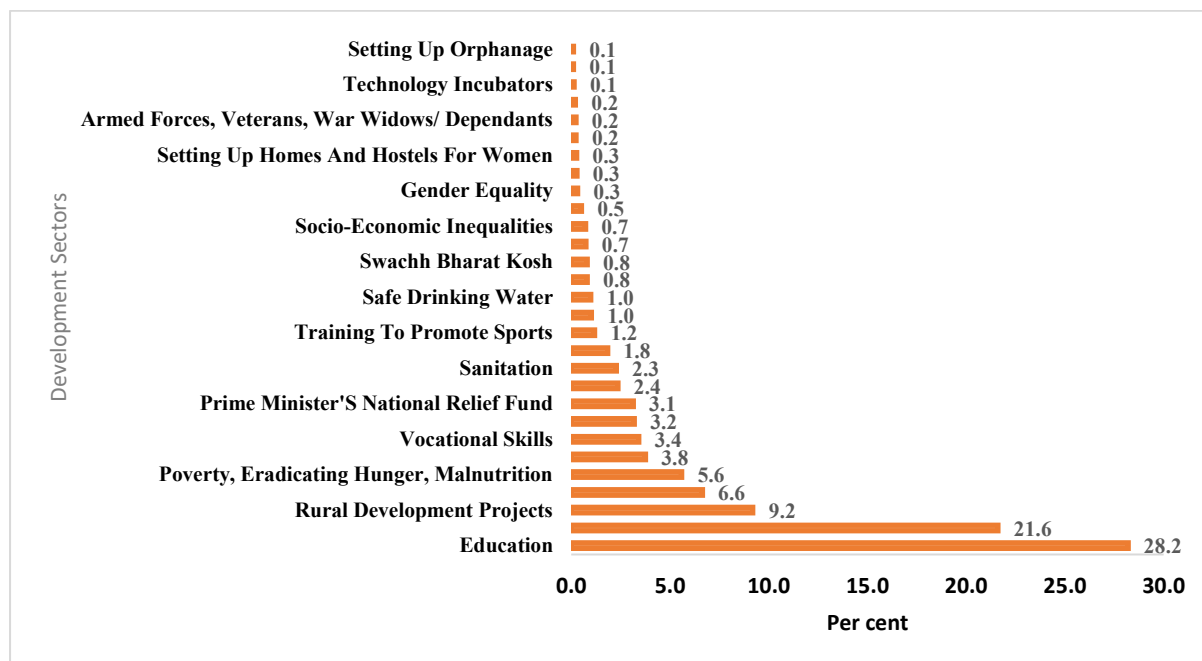
significantly higher than Tripura, Nagaland and Mizoram (Tripura (0.04%, INR Rs. 63.51 cr.), Nagaland (0.02 per cent, INR Rs. 27.61cr.) and Mizoram (0.01 per cent, INR Rs. 12.11 cr.). From 2014-15 to 2021-22, there has been low spending and minimal percentage share. These figures point to limited industrial activity in these states. The data reveals a clear stratification in that Maharashtra, Karnataka and Gujarat are at the top of CSR spending. This trend indicates that CSR contributions are predominantly concentrated in industrially developed states.

5.4 Sector-wise CSR expenditure in India

Earlier, CSR activities were categorized under 12 development sectors for mandatory spending. As per the CSR Act of 2013, Schedule VII, the following development activities are included by companies in their CSR policies. Recently education, vocational skills, rural development projects, health care, poverty, environmental sustainability, eradicating hunger and malnutrition, livelihood enhancement projects, other central government funds, Prime Minister's National Relief Fund, sanitation, art and culture, training to promote sports, women's empowerment, safe drinking water, special education, Swachh Bharat Kosh, conservation of natural resources, gender equality, agro-forestry, technology incubators, socio-economic inequalities, animal welfare, slum area development, setting up homes and hostels for women, , armed forces, veterans, war widows/dependants, senior citizens' welfare, Clean Ganga Fund and setting up orphanages were the activities under CSR spending. Sector-wise analysis of CSR spending in India from 2014-15 to 2020-21 reveals diverse trends.

Figure 5.1 presents data on CSR spending from 2014-15 to 2021-22, highlighting the percentage share for each of the 29 development sectors. The education sector received the largest share of CSR spending (₹43296.23 crore) which accounted for 28.2 per cent of all expenditures. Along with this, the highest CSR spending was on health care and rural development projects with a budget of ₹ 33182.91 cr. (21.6%) and ₹ 14119.78 cr (9.2%) respectively. The education and health sectors account for 50 per cent of total CSR spending across all the development sectors. This underscores their critical role in national development planning and corporate social responsibility priorities. In contrast, women's empowerment and safe drinking water are the least funded with ₹1563.9 cr. (1.0%) and ₹1525.9 cr. (1.0%) respectively. Only two sectors account for more than half of CSR spending, suggesting an intense concentration on infrastructure, social welfare and economic growth.

Figure 5 1: Sector-wise CSR spending in India, 2014-15 to 2021-22



Source: Author's calculation based on MCA, India,2025.

A decline in CSR spending in certain sectors shows a lower priority by corporate houses to them in spending strategies.

5.5 CSR in major sector in India

Since 2014-15, CSR spending has shown an increasing trend. However, fluctuations have occurred due to varying economic conditions and corporate financial strategies. Significant changes were noted in 2019-20 and 2020-21. In 2019-20, CSR spending on the vocational skills and rural development project sectors declined, indicating contraction. Despite prior progress, CSR spending in the poverty, hunger and malnutrition sectors saw a -3 per cent setback in 2019-20 before rebounding. The environmental sustainability sector showed fluctuating trends, declining by -29.9 per cent in 2020-21, followed by a significant surge of 129.7 per cent in 2021-22. These fluctuations highlight the potential effects of outside economic disturbances like shifts in policy, recessions or global catastrophes like the COVID-19 pandemic on CSR spending patterns. Sectors with the highest AAGR, 62.2 per cent and CAGR of 21.4 per cent were poverty, eradication of hunger and malnutrition. This indicates that despite temporary fluctuations, these sectors remained among the most dynamic and prioritised in CSR spending. The data indicates that certain sectors - particularly poverty, eradicating hunger and malnutrition, health care and vocational skills - performed well over

the long run. In contrast, education and rural development projects grew at a slower pace, suggesting potential structural issues.

Table 5 2: CSR in major sectors

Development sector/ financial Year	Education	Health care	Rural development projects	Environmental sustainability	Poverty, eradicating hunger, and malnutrition	Livelihood enhancement projects	Vocational skills
2014-15	0	0	0	0	0	0	0
2015-16	56.7	39.1	29.9	2.9	355.8	40.4	24.3
2016-17	11.7	-2.5	14.3	35.9	-50.9	31.8	10.2
2017-18	27.1	10.9	9.6	20.3	32.0	60.5	43.9
2018-19	6.0	30.3	41.2	5.1	47.4	9.1	46.1
2019-20	17.5	35.6	-5.5	7.5	-3.0	18.7	48.0
2020-21	-6.8	49.3	-19.6	-29.9	21.4	-12.9	-39.2
2021-22	-4.9	4.2	-2.7	129.7	33.1	-12.5	40.9
AAGR	13.4	23.8	9.6	24.5	62.2	19.3	24.9
CAGR	13.0	23.1	8.3	12.7	21.4	18.4	21.7

Source: Author's calculation based on MCA, India, 2025.

5.6 CSR spending by PSUs and non-PSUs in India

CSR expenditure by PSUs declined between 2014–15 and 2021–22 as only 313 PSUs were engaged in CSR in 2021–2022 compared with 493 PSUs in 2014–2015. This resulted in a negative growth rate of -25.55 per cent in PSU CSR spending. During the studied period, a sharp increase in non-PSUS was noted with a growth rate of 12.31 per cent.

Table 5 3: CSR spending by PSUs and non- PSU (in per cent)

Financial year	Non-PSUs	PSUs
2014-15	72.0	28.0
2015-16	71.0	29.0
2016-17	76.3	23.7
2017-18	78.6	21.4
2018-19	79.1	20.9
2019-20	78.7	21.3
2020-21	82.9	17.1
2021-22	83.4	16.6

Source: Author's calculation based on (MCA India, 2025).

Table 5.3 presents the share of CSR spending by PSUs and non-PSUs during the studied period. CSR spending by PSUs was 28 per cent in 2014-15 and decreased drastically to 16.6 per cent in 2021-22. Meanwhile, the share of non-PSUs in CSR spending increased by 72 per

cent and 83.4 per cent during this period respectively. This trend highlights that private-sector industrial development contributes to overall industrial development.

5.7 CSR in Maharashtra

In western India, Maharashtra is one of the country's most industrially advanced states. Its economic landscape includes rural and urban areas, contributing to the state's economic dynamism. The industry has a significant share, suggesting a robust manufacturing and production base. Favourable growth rates indicate the sector's contribution to economic development and employment generation. The industrial sector had a 24.8 per cent growth rate in 2021-22.¹⁹ CSR spending has continuously increased and the state has the highest CSR spending in India since 2014-15. Private businesses once had the freedom to decide on their involvement in charitable activities. Participation was entirely based on their interests and priorities. Following the passage of the CSR Act, private companies are now required to meet specific standards set by the government for their involvement in social activities.²⁰

Table 5 4: Growth rate of expenditure on CSR

Financial year	Annual growth rate: Maharashtra	Annual growth rate: India
2014-15	0	0
2015-16	40.18	44.22
2016-17	19.41	0.17
2017-18	15.58	17.58
2018-19	12.52	18.24
2019-20	6.53	23.49
2020-21	3.33	4.99
2021-22	50.93	-1.06
CAGR	16.43	14.5

Source: Author's calculation based on MCA, India, 2025.

Table 5.4 compares the annual growth rate and CAGR of CSR spending in Maharashtra and India from 2014-15 to 2021-22. Maharashtra recorded a growth rate of 30.18 per cent, while the national growth rate stood at 34.22 per cent. However, the following period shows significant volatility with sharp declines and rebounds. In Maharashtra, the growth rate of CSR spending dropped to 19.41 per cent, while in India, it fell drastically to just 0.17 per cent. This decline is attributed to external economic shocks, policy changes, and sectoral downturns. Maharashtra experienced a recovery in 2021–22, while India saw a significant decline of -1.06

¹⁹ Source: DSPClient (maharashtra.gov.in)

²⁰ <https://csrtimes.org/maharashtra/>

per cent. CAGR is essential for evaluating long-term economic trends. India's CAGR stood at 14.5 per cent, whereas Maharashtra's was 16.43 per cent. This showed that Maharashtra maintained a more stable long-term CSR spending trajectory than India.

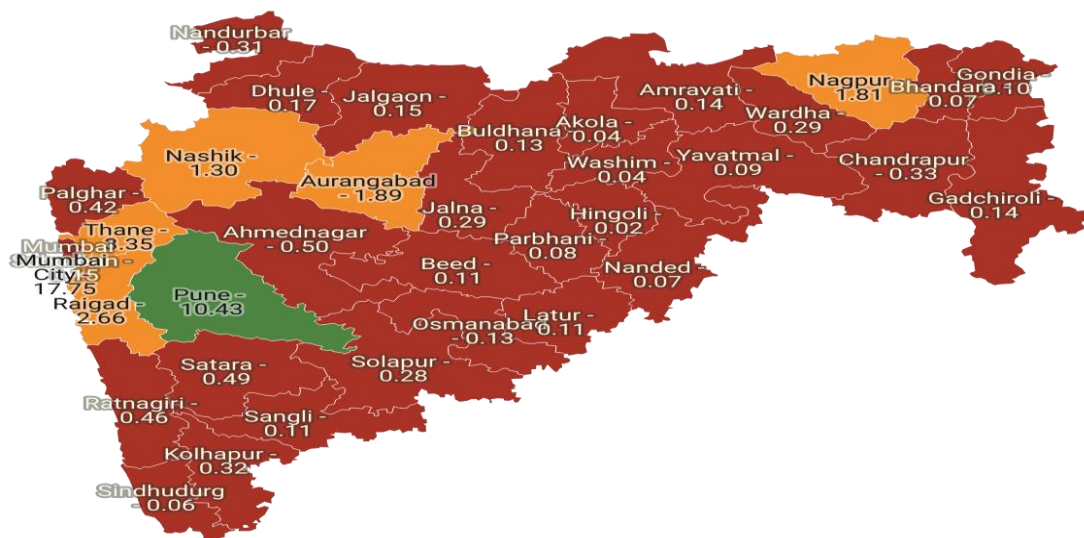
5.8 District-wise CSR expenditure in Maharashtra

The state is a central industrial hub, housing key industries such as automobiles, information technology, textiles, chemicals, pharmaceuticals and engineering. Cities like Mumbai, Pune, Nashik and Nagpur serve as major industrial hubs, attracting investments and contributing significantly to Maharashtra's GDP. Mumbai, the financial hub, is home to the Reserve Bank of India, Bombay Stock Exchange and numerous financial institutions making it a key player in the country's financial and banking sector. Pune and Mumbai are prominent IT hubs, hosting numerous multinational companies and startups. The state has played a crucial role in the growth of the IT and software services sector, contributing substantially to India's position in the global IT industry.²¹

Map 5 2: District-wise CSR spending in Maharashtra

Percentage of CSR share

Percentage Share
■ < 1 ■ 1-5 ■ ≥ 5



Map data: © OSM • Created with Datawrapper

Source: Author's calculation based on MCA, India, 2025.

As a result, CSR spending varies significantly across districts in Maharashtra, leading to inequalities in fund allocation. Mumbai, Pune, Thane and Chhatrapati Sambhajanagar

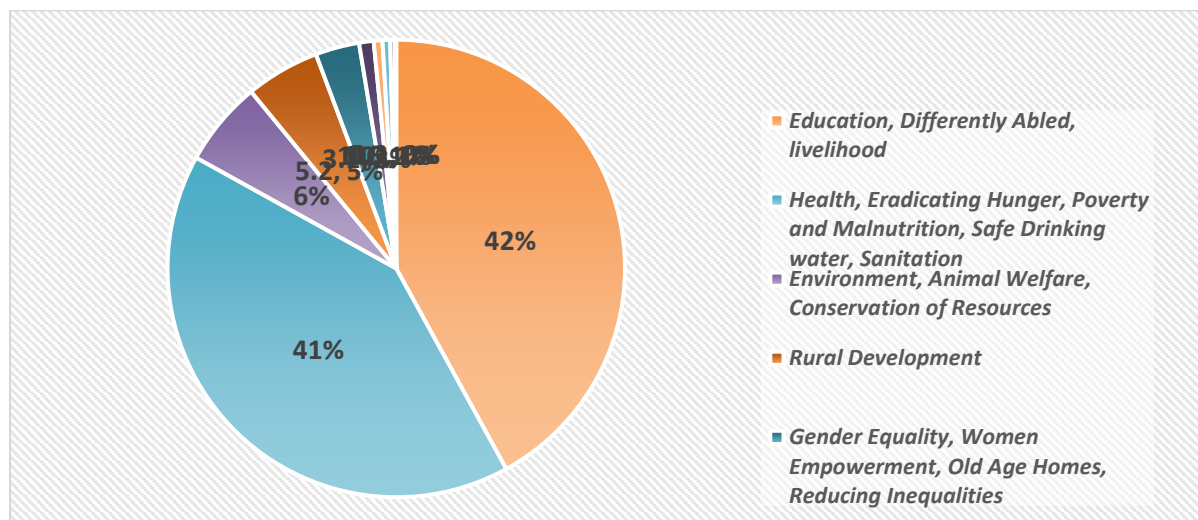
²¹ Source: DSPClient (maharashtra.gov.in)

districts have received the highest CSR spending in four years. In contrast, districts like Hingoli have received negligible CSR spending. Mumbai has received 17.75 per cent of Maharashtra’s total CSR spending, followed by Pune with 10.43 per cent and Thane with 3.4 per cent. In contrast, Washim, Hingoli and Yavatmal have received 0.04 per cent, 0.02 per cent and 0.05 per cent respectively. The unmentioned data accounts for 55.22 per cent, the highest share, and it does not give us a clear picture of CSR spending. Most CSR spending has been concentrated in Western Maharashtra, while other regions have been largely neglected. CSR spending has the potential to address regional disparities, but the CSR spending pattern shows that most companies have focused on Western Maharashtra, where these corporate houses are located. Marathwada, North Maharashtra and Vidharba are backward regions which could gain development opportunities similar to Western Maharashtra.

5.9 Sector-wise CSR expenditure in Maharashtra

CSR spending has continuously increased in both India and Maharashtra. Since 2014-15, Maharashtra has received the highest CSR spending in the country. However, there are sector-wise differences in spending in India and Maharashtra. Education has been the top priority in CSR initiatives in both India and Maharashtra. Sector-wise, CSR spending is significantly unequal in Maharashtra.

Figure 5 2: Sector-wise CSR spending in Maharashtra 2014-15 to 2021-22 (in per cent)



Source: Author's calculation based on MCA, India, 2025.

The education sector has received the highest 42.00 per cent CSR expenditure. The health sector followed closely with 41.00 per cent, while the environmental sector received 6 per cent, the rural development sector 5.2 per cent and slum area development 0.1 per cent.

The rural development sector has also received a low percentage of CSR expenditure. Thus, the education and health sectors have received more than 80 per cent of CSR spending.

5.10 CSR expenditure for rural development in Maharashtra

Due to widespread poverty, unbalanced regional development and drought people have been adversely affected in rural Maharashtra. CSR has the potential to address the challenges faced by rural Maharashtra. Sector-wise, CSR gives us an exact picture of where CSR policy has been focused. In sector-wise CSR spending, the rural development sector has received significantly less funding than the education and health sectors. CSR spending on rural development in Maharashtra is volatile and expenditures are unequal among different districts.

Table 5 5: CSR spending on rural development in Maharashtra

Year	CSR expenditure	Growth rate
2014-15	75.0	0.0
2015-16	90.4	20.6
2016-17	170.2	88.2
2017-18	126.9	-25.5
2018-19	208.2	64.1
2019-20	147.4	-29.2
2020-21	117.5	-20.3
2021-22	313.5	166.7
Total	1249.1	
CAGR		14.5

Source: Author's calculation based on MCA, India, 2025.

Table 5.5 explains the growth rate of CSR spending in Maharashtra on rural development. It saw a sharp rise from 20.6 per cent in 2015-16 to 88.2 per cent in 2016-17. However, there is volatility in the following years with significant drops and rebounds. In Maharashtra, CSR spending on rural development witnessed a sharp decline, with the growth rate dropping to -25.5 per cent. The CAGR is essential to evaluate long-term economic trends. The CAGR of rural development in Maharashtra was 14.5 per cent, while overall Maharashtra's CSR spending CAGR was 16.43 per cent. These trends showed that it maintained a more stable long-term CSR spending in overall CSR spending, but not in the village development sector.

5.11 CSR expenditure in Chhatrapati Sambhajnagar district

Chhatrapati Sambhajnagar had remarkable industrial development. The first planned MIDC industrial estate was created in Marathwada in 1964-1965 when the MIDC acquired property in Chikalthana village. In 1967-1968, a group of manufacturers in Chhatrapati Sambhajnagar collaborated to set up new industrial units in the MIDC area to address industry-related challenges and promote industrial growth. Now Chhatrapati Sambhajnagar boasts of

infrastructure facilities including airline cargo units and a broad-gauge railway line. This is responsible for its continued industrial growth. Marathwada's supply of raw materials and other items supports the region's continued industrial growth (Dhanshri Muley-Mahajan,1996). Large-scale factories in Chhatrapati Sambhajnagar including Bajaj, Videocon, Garware, Nirlep and Maharashtra Distillery are creating opportunities for MSMEs, secondary and other activities which is set for a significant leap in industrial development because of the availability of infrastructure including power, water, land and telecommunications. Key growth hubs include Waluj, Paithan, Soygaon and Vaijapur. Due to all this, Chhatrapati Sambhajnagar is an industrially key city in Marathwada. After Mumbai, Thane, Pune and Nashik, Chhatrapati Sambhajnagar is an industrial city. Therefore, CSR spending by various companies is the highest in this district within Marathwada. Total CSR spending in the district was 451.81 Cr. and its CAGR was 11.10 per cent from 2014-15 to 2021-22. However, within these years, two consecutive years (2017-18 and 2018-19) experienced negative growth rates of -0.38 per cent and -0.58 per cent. Since the overall CAGR remains positive and relatively high at 11.10, the spending witnessed significant growth, although compared with Maharashtra's CAGR, it is lower.

5.12 Sector-wise CSR expenditure in Chhatrapati Sambhajnagar district

Over the past eight years, CSR spending in Maharashtra has shown significant sectoral disparities. The environment, animal? and conservation Resources? have received the highest CSR expenditure in the sector-wise CSR expenditure. Education sector followed closely, accounting for 30.00 per cent (₹136.51 crore), while the health sector received 29.00 per cent (₹131.19 crore). In contrast, the rural development sector saw a lower allocation with only 6.00 per cent (₹26.98 crore) of the total CSR spending. Education, health and environment sectors collectively received more than 80 per cent of CSR spending in the district. In contrast, the rural development sector received a very low percentage of CSR expenditure. A sector-wise analysis of CSR spending provides a clear picture of policy priorities. This reveals that rural development has received a disproportionately small allocation compared with education and health initiatives.

5.13 Summary

The present chapter explains the CSR expenditure pattern in India, Maharashtra and Chhatrapati Sambhajnagar. It initially explains India's CSR spending pattern, specifically state-wise and sector-wise. There is an increasing CSR spending in India. State-wise, Maharashtra has the highest CSR spending and sector-wise education plays a dominant role.

Analysis of CSR spending is done district-wise and sector-wise in Maharashtra. CSR spending was higher in Mumbai, Pune, Thane, Nashik, Nagpur and Chhatrapati Sambhajnagar districts. The development sector-wise CSR spending pattern was found to be similar to India's. The study found that the growth rate of CSR spending on rural development witnessed a decline with the growth rate dropping to -25.5 per cent. The CAGR is essential to evaluate long-term economic trends. Maharashtra saw an increase, but there was tremendous volatility from 2014-15 to 2021-22. The study also presents the share of CSR spending by PSUs and non-PSUs. The share of PSUs was decreasing while that of non-PSUs was increasing. This trend highlights that the private-sector industrial development contributes to overall industrial sector development.

Chapter-6

Impact of CSR on Agricultural Growth

6.1 Introduction

This chapter evaluates the impact of CSR on agricultural growth, women's empowerment and usable drinking water facilities in villages. Apart from providing the socio-economic characteristics of the sampled households, it discusses how CSR has impacted economic factors such as irrigation area, crop pattern, crop diversity, production, productivity and employability. Social variables such as per capita foodgrain availability, government schemes and their accessibility are assessed. Also, environmental factors such as the use of technology in agriculture, use of organic pesticides and soil testing are evaluated which help sustainability. We have applied a multiple regression model to understand various factors that impact agricultural growth.

Evaluating the effect of CSR initiatives on agricultural growth and women's empowerment in the villages of the Chhatrapati Sambhajnagar district is one of the study's objectives. The present chapter is based on primary data. It focuses on the socio-demographic profile and farm-related characteristics of sample farmers' households and the characteristics of their female respondents. It also explains the Women's Empowerment Index. On the other hand, the impact of CSR activity on agricultural growth is analysed by collecting 362 samples from farmers in six villages, three CSR villages and three non-CSR villages of Sambhajnagar district. Besides, 160 women respondents were covered to assess the impact of CSR activity on their empowerment 80 women from CSR villages and 80 women from non-CSR villages (total 522 households).

6.2 Agricultural growth

The Indian economy is based on agriculture and the success of this sector can significantly influence the country's overall wealth (Kalamkar, 2003). Agriculture and related sectors accounted for 19 per cent of the GVA at current prices in 2021–2022.²² Despite being one of the nation's industrialised states, Maharashtra has a strong agricultural economy. For a majority of the people, agriculture is their primary source of income. According to the 2011 census, 54.6 per cent people are dependent on agriculture, making it the most common private sector job. Increased public investment has been the primary driver of the agricultural sector's GCF (gross capital formation). Growing at 19.04 per cent in 2022-2023, the agricultural

²² Agricultural Statistics at a Glance-2023, India.

sector's GCF as a proportion of GVA increased from 17.7 per cent in 2021-2022 to 19.9 per cent in 2022–2023, indicating a rise in agricultural investment.²³ The foundation of the Indian economy is agriculture, which continues to be a source of pride even after 75 years of industrialisation. Maharashtra contributes significantly to overall agricultural development (Kalamkar, 2003). Given the significance of agriculture, the current study has examined how CSR engagement affects agricultural growth in Chhatrapati Sambhajanagar.

Although Maharashtra is one of the more progressive states in the nation, it has traditionally been regarded as a deficit state when looking at its primary economic sector, agriculture. In Maharashtra the percentage of irrigated land covered by primary crops in 2019–20 was 20.3 per cent, whereas in India it was 53.1 per cent. Maharashtra lacks irrigation compared to Punjab, Haryana, and Uttar Pradesh.²⁴ The state has undergone the green revolution, but its impact is less than that of other states (Kalamkar, 2003). Hence, studying the effects of CSR activity through soil and water conservation and water resources management is crucial in Maharashtra, especially in rain-fed areas like Marathwada.

6.2.1 Agricultural growth analysis

This research has been attempted at three levels. We have evaluated the impact of CSR activity on agricultural growth and women’s empowerment. We have also done a comparative study of CSR and non-CSR farmers. Within CSR villages, we attempted to evaluate different effects on farmers who have irrigation or not. Within irrigation areas, we studied CSR’s effects on micro-irrigation adopters and non-micro-irrigation adopters. A total of 362 sample households were selected for the study: 194 CSR farmers and 168 non-CSR farmers. A first-level comparative study was done on these 362 farmers.

Table 6 1: Agricultural growth analysis process

Analysis type		No. of farmers	%	Total
Type 1 CSR & non-CSR	CSR	194	53.6	362
	Non-CSR	168	46.4	
Type 2 Intra CSR	Irrigated	170	87.6	194
	Non-irrigated	24	12.4	
Type 3 Intra-irrigated	Micro irrigation adopter	128	75.3	170
	Non-micro irrigation adopter	42	24.7	

Source: Author’s calculation based on the field survey (2022).

JBGVS has taken various CSR initiatives in CSR villages. One of them was soil and water conservation and water resources management. How these activities have impacted

²³ Ibid.

²⁴ Ibid.

irrigated and non-irrigated farmers was assessed, and 170 farmers with an irrigation facility and 24 farmers without an irrigation facility were considered (194= 170 + 24). Also, a third-level analysis was done to identify the difference between micro-irrigation adopters and non-micro-irrigation adopters. For this, 128 micro-irrigation adopters and 42 non-adopters were considered (170= 128 + 42).

6.2.2 Socio-economic profile of households

Various Socioeconomic variables provide information for analysis and understanding the research problem. Economic variables such as land holding, family income and employment, and social variables such as sex ratio, religion, cast, age and type of family provide the economic and social context of the selected sample population. Table 6.2 presents the socioeconomic profile of the CSR and non-CSR samples. It reports the percentage distribution of CSR and non-CSR population by sex/gender, age group, type of family, religion, category, education, marital status, dependency and dependency ratio. As many as 194 farmers have land and belong to the CSR-adopted villages, which are referred to as CSR (treatment) village farmers and 168 farmers have land but do not belong to the CSR-adopted villages referred to as non-CSR farmers (households).

The percentage of households led by women is smaller than that of households headed by men, as 95.9% of the 362 sample households are headed by men and 4.1% by women. Male farmers make up the majority of both sample groups. Although there were relatively few agricultural households led by women, the percentage of women employed in agriculture was greater than that of males, according to the village survey. In the case of age distribution of the sample respondents, 68.5 per cent of respondents belonged to the 35-65 age group, followed by 14.9 per cent in the 65 and above age group, 12.4 per cent in the 25-34 age group and 4.1 per cent in the 15-24 age group. The average age of CSR respondents was 46.5 years as against 48.4 years for non-CSR respondents, indicating that the mean age of CSR respondents is lower compared with non-CSR respondents. But no significant difference was found in the age of CSR and non-CSR respondents. Further, the type of family status shows that 204 households (56.4%) belong to a nuclear family, followed by 158 households (43.6%) living in a joint family.

Table 6 2: Socio-economic profile of households

Village type/ gender	CSR		Non-CSR		Total		Statistic test	Value	Sig. (2- tailed)
	Count	Per cent	Count	Per cent	Count	Per cent			
Sex/gender									
Male	186	95.9	161	95.8	347	95.9	Chi-square	0	0.984
Female	8	4.1	7	4.2	15	4.1	Fisher's Exact		1.000
Age group (yrs.)									
15-24	8	4.1	7	4.2	15	4.1	Chi-square	1.04	0.792
25-34	27	13.9	18	10.7	45	12.4			
35-64	132	68.0	116	69.0	248	68.5			
65 and above	27	13.9	27	16.1	54	14.9			
Age mean	46.5		48.4		47.3				
Type of family									
Joint family	84	43.3	74	44.0	158	43.6	Chi-square	0.02	0.886
Nuclear family	110	56.7	94	56.0	204	56.4	Fisher's Exact		0.916
Religion									
Hindu	193	99.5	143	85.1	336	92.8	Chi-square	31.01	0.000
Buddhist	1	0.5		0.0	1	0.3	Fisher's Exact		0.000
Muslim		0.0	25	14.9	25	6.9			
Category									
General	80	41.2	81	48.2	161	44.5	Chi-square	12.3	0.015
SC	15	7.7	9	5.4	24	6.6			
ST	11	5.7	0	0.0	11	3.0			
OBC	79	40.7	66	39.3	145	40.1			
NT	9	4.6	12	7.1	21	5.8			
Education									
No schooling	25	12.9	31	18.5	56	15.5	Mann-Whitney U	14675.5	0.092
Upper primary	49	25.3	40	23.8	89	24.6	Z	-1.68	
Secondary	64	33.0	59	35.1	123	34.0			
Higher secondary	35	18.0	23	13.7	58	16.0			
Graduation & above	21	10.8	15	8.9	36	9.9			
Marital status									
Married	189	97.4	159	94.6	348	96.1			
Single	3	1.5	6	3.6	9	2.5			
Divorced	0	0.0	0	0.0	0	0.0			
Widowed	2	1.0	3	1.8	5	1.4			
Dependency ratio									
0-14	117	13.7	88	12.0	205	12.9			
15-64	680	79.6	584	79.6	1264	79.6			
65 above	57	6.7	62	8.4	119	7.5			
Dependency ratio	25.6		25.7		25.6				

Source: Authors' calculation based on the field survey (2022).

The mean household size is five persons per household, slightly larger in non-CSR households than in CSR households. The religious status of households shows that about 92.8

per cent of households are Hindus, 6.9 per cent Muslims and 0.3 per cent Buddhists. The Hindu population was the highest (99.5%) in CSR villages and the Muslim population was higher in non-CSR villages. The association between the farmer's religion and the kind of village was investigated using a chi-square test of independence. Pearson's chi-square test was significant with the Hindu population in CSR villages. The caste status of households shows about 44.5 per cent belonged to the General category, 40.1 per cent to OBCs, 6.6 per cent to scheduled castes (SCS) and 5.8 per cent to NTs. The remaining 0.3 per cent are from the ST category. CSR households accounted for 41.2 per cent and belonged to the general category, while non-members accounted for 48.2 per cent. A chi-square test of independence was done to examine the relationship between the type of village and the farmer's social category. The relation between these variables was significant ($N = 362$), $p = 0.02$. This implies that there is enough statistical evidence to prove whether a farmer was from a CSR/non-CSR village and their social category. There were no ST respondents from a non-CSR village.

Literacy and educational attainment are significant determinants that support agricultural growth. Table 6.1 shows that 15.5 per cent of respondents are illiterate, 24.6 per cent have finished upper primary and 34.0 per cent have secondary education. But 16.0 per cent respondents have completed higher secondary and only 9 per cent have finished graduation. A Mann-Whitney U test was conducted to determine whether there was a difference in the median education level between farmers from CSR and non-CSR villages. Results indicate no significant difference in them, farmers from CSR and non-CSR villages, $z=1.68$, $p=0.092$.

The marital status for CSR and non-CSR respondents is displayed in Figure 6.1. The majority, comprising 97.4 per cent of CSR and 94.6 per cent of non-CSR farmers, are married. Roughly 2.7 per cent of the respondent farmers were single with 1.4 per cent of STs widowed and none separated or divorced. Arithmetic mean values of household size and dependency ratio are presented in Table 6.1. The dependency ratio for CSR was 25.6 and for non-CSR, 25.7 per cent. Nearly 25 per cent of the total population was dependent.

6.2.3 Basic characteristics of sample households

Basic characteristics of households are shown in Table 6.3. The mean age of CSR households was 48 years and that of non-CSR households 50.4. SD of CSR respondents was 12.7 years and non-CSR respondents 12.2 years. The average land holding was 1.8 ha. and 1.7 ha. holding of CSR and non-CSR households respectively. No significant difference was found in household land holding because the sample households were proportional. Differences were

found in land under irrigation between CSR and non-CSR villages. The mean land area under irrigation in CSR villages was 1.3 hectares, and that of non-CSR villages was 0.9 hectares. Mean land holding under irrigation was higher in CSR villages than non-CSR villages. The standard deviation of irrigation was 1.1 ha for CSR and 1.2 ha for non-CSR. Non-CSR villages have higher SD than CSR villages which means there is more inconsistency in non-CSR villages than in CSR villages. In short, in non-CSR villages some households have more irrigated land, while others have minimal irrigation land.

Table 6 3: Basic characteristics of sample households

Village type/characteristics	CSR		Non-CSR	
	Mean	SD	Mean	SD
Age of the respondents	48.0	12.7	50.4	12.2
Land holding	1.8	1.2	1.7	1.5
Land under irrigation	1.3	1.1	0.9	1.2
Livestock	3.9	8.3	2.0	2.9
Net annual income	187351	167762	118792	138628
Marginal farmers (below 1.00 hectares)	0.7	0.20	0.6	0.2
Small farmers (1.00-2.00 hectare)	1.5	0.33	1.3	0.2
Semi-medium farmers (2.00-4.00 hectares)	2.6	0.38	2.6	0.7
Medium farmers (4.00-10.00 hectares)	4.8	1.16	5.9	1.7
Large farmers (10.00 hectares and above)	10.0	NA	10.0	NA

Source: Author's calculation based on the field survey (2022).

The mean livestock in CSR villages was 3.9 and in non-CSR villages 2. Mean livestock was higher in CSR villages than in non-CSR villages. The livestock's SD was 8.3 for CSR and 2.9 for non-CSR villages. CSR villages have a higher SD than non-CSR villages, meaning that in CSR villages some households have a higher number of livestock, while others have few. The average net annual income of CSR households was Rs. 1,87,381. It was Rs. 1,18,792 in non-CSR households, significantly less than the average NAI CSR farmers. The selection of farmers remains proportionally significant, a difference observed in men of NAI. According to the Ministry of Agriculture & Farmers Welfare, the average NAI of Indian farmers was 1,22,616.²⁵ The average NAI of CSR farmers is higher than India's average NAI, but the average NAI of non-CSR farmers is less than India's average NAI.

6.2.4 Agricultural assets status

Agricultural assets are crucial to the financial condition of farmers. Landholding, livestock and irrigation availability are among the economic variables. Landholding in

²⁵ <https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2003180>

agriculture plays a vital role in the socio-economic situation of households. It provides an opportunity for families to improve their socio-economic development. Table 6.4 gives information about agricultural land holdings in both types of villages.

Table 6 4: Agricultural assets

Village type/irrigation available	CSR- villages		Non-CSR villages		Total		Statistical test	Value	Sig. (2-tailed)
	Count	Per cent	Count	Per cent	Count	Per cent			
Type of farmers									
Marginal farmers	56	28.9	49	29.2	105	29.0	Chi-square	0.05	0.997
Small farmers	72	37.1	63	37.5	135	37.3			
Semi-medium farmers	55	28.4	46	27.4	101	27.9			
Medium farmers	10	5.2	9	5.4	19	5.2			
Large farmers	1	0.5	1	0.6	2	0.6			
Livestock available									
Yes	151	77.8	97	57.7	248	68.5	Chi-square	16.85	0.000
No	43	22.2	71	42.3	114	31.5	Fisher's Exact		0.000
Irrigation available									
Farmers with irrigation facility	170	87.6	119	70.8	289	79.8	Chi-square	15.776	0.000
Farmers without it	24	12.4	49	29.2	73	20.2	Fisher's Exact		0.000
Micro-irrigation adoption (out of irrigated farmers)									
Micro-irrigation adopter	128	75.3	51	42.9	179	61.9	Chi-square	31.241	0.000
Micro-irrigation non-adopter	42	24.7	68	57.1	110	38.1	Fisher's Exact		0.000

Source: Author's calculation based on the field survey (2022).

It is observed that 29 per cent were marginal farmers, 37.3 per cent small farmers, 27.9 per cent semi-medium farmers, 5.2 per cent medium farmers and only 0.6 per cent large farmers. Nearly 56.9 per cent farmers were marginal and smallholders, which shows small land holdings in both the CSR and non-CSR villages. No significant difference was found in CSR and non-CSR villages because of the proportional distribution of sample farmers. Approximately 68.5 per cent of respondents have livestock. About 77.7 per cent are CSR farmers and 57.7 per cent non-CSR farmers. Livestock with CSR and non-CSR farmers significantly differ. A chi-square test of independence was used to look at the connection between the livestock and the types of villages. These factors had a substantial relationship. This implies that there is enough statistical evidence that CSR farmers have more livestock assets than non-CSR farmers.

Despite being a global pioneer in irrigation infrastructure, 47 per cent of India's and 79.7 per cent of Maharashtra's total croplands are still rainfed and dependent on monsoon. Low

water use efficiency (WUE) levels in agriculture hamper sustainable development of water resources. In Indian agriculture, the WUE is currently estimated to be between 35 per cent and 40 per cent for canal irrigation and roughly 60 per cent for groundwater irrigation (Subhash et al., 2020). Although micro irrigation systems have the potential to save water, their efficacy could not result in net savings at aggregate levels such as basins or watersheds. This is because if return flows, which replenish subterranean water sources, are deemed beneficial, the net water savings could be little (Molden et al., 2001; Narayanmoorthy et al., 1997). Consequently, unless institutional and economic policy tools are implemented to guarantee a fair distribution or allocation of conserved water, implementing micro-irrigation technology may not always result in water savings at the basin. Micro irrigation technology has taken the center stage in India's policy debate to enhance farmers' welfare and water usage efficiency in the face of growing water shortages. Between 2005–06 and 2023–24, India's total area under micro-irrigation grew significantly from 2.24 million hectares (Mha) to 16.73 Mha.²⁶ In 2023–24, sprinkler and drip irrigation systems comprised 54.05 per cent and 45.9 per cent of the total area respectively. Micro-irrigation adopters experienced higher income and production levels than non-adopters. The cost of inputs was lower for adopters than for non-adopters (Shroff & Miglani, 2021). In Gujarat, the higher net return on the chosen crops by the adopters ranged from 17.63 to 52.01 per cent, while the overall cost savings ranged from 4.15 to 30.39 per cent (Subhash et al., 2020).

Micro-irrigation is crucial for increasing irrigation, production and productivity. Excess water use and little micro-irrigation are important characteristics of Maharashtra and Marathwada. Although the government has taken multiple initiatives to improve irrigated area and areas under micro irrigation, the farmers' response is lukewarm. Therefore, there was a need to actively participate in soli and the water conservation programme, and JBGVS has been taking this initiative as a part of its CSR activity. We have studied the impact of this initiative in this study. Irrigation shows agricultural development. Nearly 79.8 per cent of farmers have irrigation facilities in both types of villages, but CSR village farmers have 87.6 per cent more facilities than non-CSR village farmers (70.8%). The association between village type and irrigation was examined using a chi-square test of independence. These factors had a substantial relationship. This implies statistical evidence that more CSR farmers have irrigation facilities than non-CSR farmers.

²⁶ Agricultural Statistics at a Glance 2023, GOI.

Approximately 75.3 per cent of the CSR-IP farmers have adopted micro-irrigation, while in non-CSR villages, only 42.9 per cent of farmers have done so. Micro-irrigation adoption in CSR and non-CSR villages significantly differs. The relationship between village type and adoption of micro-irrigation was investigated using a chi-square test of independence. These factors had a substantial relationship. This implies enough statistical evidence that more CSR farmers have adopted micro-irrigation than non-CSR farmers. Nearly 74.7 per cent of farmers have one irrigation source in the CSR villages and 92.4 per cent in non-CSR villages. Irrigation with two sources was higher in CSR villages (22.9%) than in non-CSR villages (6.7%). Farmers with three irrigation sources were 2.4 per cent in CSR villages, whereas in non-CSR villages, they were only 0.8 per cent. Differences were found in the number of irrigation sources between farmers from CSR and non-CSR villages. Results indicate that farmers from CSR villages had more irrigation sources than farmers from non-CSR villages. The objective of JBGVS was to make these villages self-sufficient in water and increase the water level in them. It has set many committees that help and promote water saving and micro irrigation.

6.2.5 Economic factors

Various economic factors have been considered to assess the relevance of CSR activity to agricultural growth. They include production, productivity, employment, crop intensity, crop diversity, crop pattern and farmers' incomes.

6.2.5.1 Land under irrigation

Net irrigated area is land that receives irrigation only once a year. The gross irrigated area is the sum of the land irrigated once a year and the area irrigated more than once. Land area under irrigation in CSR and non-CSR villages has been presented in Table 6.5. The mean of NIA in CSR villages was 1.45 ha and in non-CSR villages 1.21. A t-test was performed to examine the relationship between the type of village and land under irrigation. The relation between these variables was significant. This implies enough statistical evidence regarding NIA to prove the difference between CSR and non-CSR farmers. The mean GIA in CSR villages was 2.32 ha and in non-CSR villages 1.1 ha. A t-test was done to examine the relationship between the type of village and the GIA. The relation between these variables was significant. This implies enough statistical evidence regarding GIA to prove the difference between CSR and non-CSR farmers. The difference in GIA is higher than the mean difference in NIA. The mean difference of NIA was 0.24 ha and GIA was 1.22 ha. This shows that in non-CSR villages cultivation is done during the kharif season but little cultivation is undertaken

during the rabi season. GIA considers the sum of the land irrigated yearly and the area irrigated more than once. When water availability and irrigation are limited, GIA is lower. Furthermore, in non-CSR villages, GIA is lower.

Table 6 5: Land area under irrigation

Land under irrigation	Mean	SE	SD	Mean	SE	SD	t value	Mean Diff	Sig. (1 tailed) for CSR > non-CSR
CSR & non-CSR	CSR			Non-CSR					
Net irrigated land in ha in 2020-21	1.45	1.04	0.08	1.21	1.22	0.11	1.77	0.24	0.039
Gross irrigated area (GIA) in ha in 2020-21	2.32	1.67	0.13	1.1	1.36	0.12	6.6	1.22	0.000
Intra-irrigation	CSR – MI			CSR-NMI					
Net irrigated land in ha in 2020-21	1.62	1.12	0.1	0.95	0.54	0.09	5.12	0.67	0.000
Gross irrigated area (GIA) in ha in 2020-21	2.59	1.8	0.16	1.52	0.78	0.12	5.34	1.06	0.000

Source: Author’s calculation based on the field survey (2022).

Within CSR villages, we have analysed the difference between irrigation, micro irrigation adopted and non-micro irrigation adopted. The mean NIA of micro-adopters was 1.62 ha and that of non-micro-irrigation adopters 0.95 ha. The mean GIA of micro adopters was 2.59 ha and that of non-micro irrigation adopters 1.52 ha. A t-test examined the difference between micro irrigation adopters and non-adopters in CSR villages. The difference between these variables was significant. This implies enough statistical evidence exists regarding NIA and GIA to prove the difference between micro irrigation adopters and non-micro irrigation adopters. This shows the importance of micro irrigation and water management. NIA and GIA would improve if we adopt water management and micro irrigation.

Many studies highlight a strong relationship between irrigation development and expansion of net irrigated area. Sharma and Narayanmoorthy (1999) noted a positive relationship between irrigation and NIA. Minor irrigation and groundwater sources improved irrigated areas in semi-arid regions (World Bank, 2006). Kumar et al. (2011) also emphasized the importance of bore wells in the Deccan Plateau for increasing cultivable land. FAO (2015) states that countries like Egypt, China and Pakistan expanded their net irrigated areas through large-scale irrigation projects. This demonstrates the transformative impact of irrigation on agriculture. Several studies highlight a direct relationship between irrigation and NIA. In many cases, irrigation leads to intensification - more cropping cycles on the same land, rather than expanding the total area irrigated. Seckler et al. (2000) found that irrigation improves cropping

intensity, not NIA. Shah (2009) noted that in states like Gujarat and Rajasthan, overuse of groundwater has caused falling water tables and reduced net irrigated areas despite earlier gains.

In short, the relationship between irrigation and NIA should be understood a context-specific manner. Irrigation systems, climate conditions, types of irrigation systems, groundwater, water management and people's awareness play a crucial role in irrigation and NIA. In addition to building infrastructure, irrigation strategies should ensure the efficiency, fairness and sustainability of water use. JBGVS is doing that well.

6.2.5.2 Change in gross cropped area

Gross cropped area is the total area sown with crops and orchards once or more a year. It also includes the net sown area. A comparison of growth in GCA between CSR and non-CSR villages reveals that GCA in 2016-17 was not statistically significant, but it was statistically significant in 2020-21. The mean GAC of CSR villages was 1.46 ha and non-CSR 1.6 ha in 2016-17. The mean difference was -14 ha. Mean GCA was higher in non-CSR villages before CSR was implemented in CSR villages. The mean GAC of CSR villages was 2.55 ha and non-CSR 1.9 ha in 2020-21. The mean difference was 0.65 ha. Mean GCA was higher in CSR villages after CSR was implemented. A t-test was performed to examine the difference between CSR and non-CSR villages. The GCA difference between CSR and non-CSR was significant in 2020-21. This implies enough statistical evidence to prove the difference between CSR and non-CSR farmers. This shows the importance of CSR activity in villages.

Table 6 6: Change in gross cropped area

Change in gross cropped area (ha.)	Mean	SE	SD	Mean	SE	SD	t value	Mean diff	Sig. (1 tailed)
CSR & non-CSR	CSR			Non-CSR					
GCA in ha in 2016-17	1.46	1.15	0.08	1.6	1.55	0.12	-0.97	-0.14	0.166
GCA in ha in 2020-21	2.55	1.74	0.13	1.9	1.81	0.14	3.46	0.65	0.001
GCA from 2016-17 to 2020-21	1.09	0.97	0.07	0.31	0.61	0.05	9.32	0.78	0.000
Intra-CSR	CSR-IP			CSR-NIP					
GCA in ha in 2016-17	1.5	1.19	0.09	1.12	0.67	0.14	1.54	0.38	0.063
GCA in ha in 2020-21	2.74	1.76	0.13	1.17	0.79	0.16	4.32	1.57	0.000
Growth in GCA from 2016-17 to 2020-21	1.24	0.95	0.07	0.05	0.18	0.04	14.6	1.19	0.000
Intra-irrigation	CSR-MI			CSR-NMI					
GCA in ha in 2016-17	1.52	1.3	0.12	1.45	0.77	0.12	0.35	0.07	0.364
GCA in 2020-21	2.96	1.9	0.17	2.08	0.96	0.15	3.92	0.88	0.000
GCA from 2016-17 to 2020-21	1.44	0.98	0.09	0.63	0.5	0.08	6.94	0.81	0.000

Source: Author's calculation based on the field survey (2022).

The mean GAC of (intra-CSR) CSR irrigation present was 1.5 ha and CSR non-irrigation present was 1.12 ha in 2016-17, but was not statistically significant. GAC of CSR-IP was 2.74 ha and CSR-NIP 1.17 ha in 2020-21. The mean difference was 1.57 ha. Mean GCA was higher in CSR-IP after CSR was implemented in CSR villages. A t-test was performed to examine the difference between CSR-IP and CSR-NIP. The GCA difference between CSR-IP and CSR-NIP was significant in 2020-21. This implies enough statistical evidence to prove the difference between CSR and non-CSR farmers. This shows the importance of CSR activity in villages.

The growth mean for CSR, CSR-IP and CSR-MI was 1.09 ha, 1.24 ha and 1.44 ha respectively. The growth mean for non-CSR, CSR-NIP and CSR-NMI was 0.31, 0.05 and 0.63 respectively. A comparative difference was found to be higher between them. These differences are statistically significant. Another significant indicator of agricultural development is the growth in gross cultivated area. Table 6.6 shows that with a mean difference of 0.78 ha, the gross cropped area growth rate for the entire period was positive and substantial. Thus, the analysis shows a significant rise in gross cropped area over the period. JBGVS's numerous initiatives, which provided irrigation facilities in the CSR communities, may be to blame for this growth.

Irrigation and GCA have a strong relationship. Studies by Bhalla and Singh (1997) and the World Bank (2006) confirm that irrigation enables double and triple cropping, especially in semi-arid regions. Similarly, countries like Egypt and Pakistan have expanded GCA through intensive irrigation systems. However, the relationship is not always strong. Despite irrigation facilities, GCA remains low in some areas due to poor irrigation management, groundwater depletion and poor rainfall. Shah (2009) highlighted how the over-extraction of groundwater in Gujarat has reduced cropping intensity. Climate change and erratic rainfall also affect irrigation reliability, limiting its impact on GCA. The effectiveness of irrigation depends on multiple factors such as water management, micro irrigation and the type of crop they cultivate.

6.2.5.3 Change in crop intensity

Cropping intensity is the ratio of net area sown to the total cropped area. Irrigation and cropping intensity are essential for assessing a region's agricultural progress. The type of crop production, cropping patterns, crop diversity and rotation possibilities, agricultural revenue opportunities, and rural employment are all significantly influenced by cropping intensity (Mondal & Sarkar, 2021). Increasing cropping intensity is a tried-and-true method of raising agricultural productivity and creating jobs in rural areas (Ibid.). However, the type of input

used in agriculture and the current agroecological circumstances play a significant role in determining the degree of cropping intensity and employment (Ibid.). Rainfall intensity is relatively low in most districts of Maharashtra and Marathwada. Hence, irrigation is essential to the stability and expansion of agriculture. How irrigation has impacted the change in cropping intensity is explained in Table 6.7. We have also calculated the cropping intensity index.

Table 6 7: Change in crop intensity

Change in crop intensity (gross cropped area/net sown area*100)	Mean	SE	SD	Mean	SE	SD	t value	Mean diff	Sig. (1 tailed) for CSR > non-CSR
CSR & non-CSR	CSR			Non-CSR					
Crop intensity in 2016-17	86.21	36.56	2.62	96.4	44.78	3.45	-2.38	-10.18	0.991
Crop intensity in 2020-21	147.07	42.67	3.06	113.75	44.79	3.46	7.24	33.31	0.000
Cropping intensity index (ratio of both years)	202.2	137.51	9.92	126.68	64.76	5.06	6.78	75.52	0.000
Intra-CSR	CSR-IP			CSR-NIP					
Crop intensity in 2016-17	83.88	37.61	2.88	102.71	22.4	4.57	-3.48	-18.82	1.000
Crop intensity in 2020-21	152.99	41.61	3.19	105.14	21.46	4.38	8.83	47.85	0.000
Cropping intensity index (ratio of both years)	216.35	141.41	10.91	103.13	11.21	2.29	10.16	113.23	0.000
Intra-irrigation	CSR-MI			CSR-NMI					
Crop intensity in 2016-17	77.02	34.01	3.01	104.79	40.64	6.27	-4.37	-27.77	1.000
Crop intensity in 2020-21	152.56	31.61	2.79	154.3	63.54	9.8	-0.17	-1.74	0.568
Cropping intensity index (ratio of both years)	237.27	155.62	13.86	153.58	47.34	7.31	5.34	83.69	0.000

Source: Author's calculation based on the field survey (2022).

Table 6.7 exhibits crop intensity. The mean crop intensity of CSR, CSR-IP and CSR-MI was 86.21, 83.88 and 77.02 respectively and the mean crop intensity in non-CSR, CSR-NIP and CSR-NMI was 96.4, 102, and 104.7 respectively, in 2016-17. Crop intensity in non-CSR villages was higher than in CSR villages in 2016-17. The mean crop intensity of CSR, CSR-IP and CSR-MI was 147.07, 152.9 and 152.6 respectively and the mean crop intensity in non-CSR, CSR-NIP and CSR-NMI was 113.7, 105.1 and 154.3 respectively. In 2016-17 crop intensity in non-CSR villages was higher than in CSR villages. A t-test examined the difference between CSR, CSR-IP and CSR-MI, and non-CSR and CSR-NIP. The difference between these variables was not significant in 2016-17. Crop intensity of non-CSR was higher in 2016-17 and the trend reversed in 2020-21. Crop intensity difference was significant in 2020-21. Cropping intensity for CSR-MI and CSR-NMI was not statistically significant.

The cropping intensity index was statistically significant in CSR, CSR-IP, and CSR-MI. This shows that there is a positive correlation between irrigation and cropping intensity.

The mean of GIA in CSR villages was 2.32 ha, and in non-CSR it was 1.1 ha in 2020-21. The cropping intensity index for CSR villages was 202.2 and 126.6 for non-CSR, which shows higher irrigation and higher cropping intensity. Some similar studies have concluded a positive and strong correlation between crop intensity and irrigation development (Dhawan, 1991; Karunakaran & Palanisami, 1988). Sivasubramanniyam (2000) found that the availability of healthy water and the location of land significantly impacted cropping intensity. High CI was recorded in the villages under deep sluices because they got supplies longer than the tail reach/elevated sluice villages. Mondal and Sarkar (2021) found a low positive correlation between irrigation and cropping intensity. This indicates that cropping intensity was also influenced by other factors such as fertilisers, technological inputs and HYV seeds of cereals. Water availability and the effective use of irrigation methods impact crop intensity, and there is a positive relationship between cropping and irrigation intensity.

6.2.5.4 Cropping pattern

A cropping pattern refers to the proportion of land under cultivation of various crops at different times. India's agricultural development is represented by shifts in cropping patterns over time. A growing shift in agriculture from subsistence to commercial farming has been linked to the change. Increases in irrigation, technological advancements, market dynamics and institutional mechanisms affect cropping patterns (De.K., 2003). Table 6.8 explains cropping patterns. Comparisons have been made between CSR and non-CSR farmers. Cropping patterns help us understand economic growth and sustainability. The Table shows the area under various crops. Among all crops, cotton was a widely cultivable crop in CSR and non-CSR villages. In non-CSR villages, cotton cultivation area contributes 47.5 per cent and in CSR villages 28.4 per cent was used for cultivation. Maize and wheat are two primary cereal crops cultivated in CSR villages (20.8% and 11.5%). Vegetables and fruits are crucial in diversifying agricultural income and ensuring food security. Onion is widely grown in CSR villages (10.9 hectares) and CSR-MI (9.3 hectares). Tomatoes are cultivated in CSR villages (5.5%) and CS-MI (7.2%). Ginger is grown in CSR villages (5.8%) and CSR-MI (7.5%). This analysis of crop distribution highlights the differences in agricultural priorities. The predominance of cotton in all regions indicates its economic importance. However, CSR villages and CSR-MI exhibit a more diversified cropping pattern, reducing their dependency on a single crop. According to the data, increasing crop diversity, upgrading irrigation systems and implementing sustainable farming methods have raised output and profitability.

Table 6 8: Cropping pattern

Crop area in ha 2020- 21	CSR farmers		Non-CSR farmers		Irrigated land of farmers		Non- irrigated land of farmers		Micro irrigation adopter		Non- adopter	
	Ha	%	Ha	%	Ha	%	Ha	%	Ha	%	Ha	%
K Maize	103.1	20.8	65.3	20.4	93.7	20.1	9.4	33.3	71.9	19.0	21.9	25.0
K Cotton	140.3	28.4	151.8	47.5	123.5	26.5	16.8	59.6	88.9	23.5	34.6	39.6
K Ginger	28.9	5.8	15.7	4.9	28.9	6.2	0.0	0.0	28.3	7.5	0.6	0.7
K Tur	15.2	3.1	15.1	4.7	14.4	3.1	0.8	2.8	10.6	2.8	3.8	4.3
K Onion	10.9	2.2	2.57	0.8	10.9	2.3	0	0.0	9.3	2.5	1.6	1.8
K Bajra	3.3	0.7	1.5	0.5	2.9	0.6	0.4	1.4	2.7	0.7	0.2	0.2
K Tomato	27.2	5.5	10.5	3.3	27.2	5.8	0.0	0.0	27.2	7.2	0	0.0
K Others	2.9	0.6	2.2	0.7	2.9	0.6	0	0.0	2.9	0.8	0	0.0
Vegetables												
KSoyabean	6.2	1.3	3	0.9	6.2	1.3	0	0.0	4.8	1.3	1.4	1.6
R Grams	33.9	6.9	11.24	3.5	33.3	7.1	0.6	2.1	27.3	7.2	6	6.9
R Jowar	10.4	2.1	5.8	1.8	10.4	2.2	0	0.0	6.8	1.8	3.6	4.1
R Maize	11.75	2.4	2.6	0.8	11.75	2.5	0	0.0	10.95	2.9	0.8	0.9
R Onion	18.1	3.7	1.05	0.3	18.1	3.9	0	0.0	16.2	4.3	1.9	2.2
R Wheat	56.8	11.5	12.8	4.0	56.8	12.2	0	0.0	45.8	12.1	11.0	12.5
Mosambi	6.4	1.3	9.03	2.8	6.4	1.4	0	0.0	6.4	1.7	0	0.0
Total GCA	494.45	100	319.57	100	466.4	100	28.11	100	378.94	100	87.4	100

Source: Author's calculation based on the field survey (2022). Note: K= Kharif R= Rabi

Since Chhatrapati Sambhajnagar is a drought-prone district, more crops are grown only during the kharif season in villages with no water facility, and very few crops are grown during the rabi season. Cotton is grown in more than 50 per cent of the area.²⁷ Rabi crops, fruits, flowers, tomatoes and vegetables are cultivated less. We found a similar pattern in non-CSR villages. However, farmers in CSR villages have much higher areas under cultivation of tomatoes, onions and ginger than in non-CSR villages. A similar pattern was observed in CSR-MI farmers. Several variables including the availability of chemical fertilisers, irrigation infrastructure, advanced equipment and technical expertise influence crop selection. Technological advancements may bring new cost-benefit relationships leading to new cropping patterns. When land is scarce for cultivation, farmers can boost income from their restricted plots by doing proper cropping (De U., 2003). According to Geeta, M. (2017), Cropping pattern shifts are influenced by gross cropped area, percentage of gross irrigated area and land size. Crop pattern and distribution of crops depend mainly on the irrigation system and the distribution quality of water (EI-Hadidy et al., 2014). In CSR villages, along with soil and water conservation and water resources management, various technologies have been introduced to

²⁷ Department of Agriculture, Government of Maharashtra 2021-22.

farmers such as water use technology, soil testing, organic farming technology, etc. This has encouraged farmers to change their cropping patterns.

6.2.5.5 Crop diversity

Crop diversification is allocating resources to different crops based on their relative benefits. It is often seen as a shift from traditional lower-value crops to higher-value crops and is a crucial step in advancing agriculture. Crop diversification helps to reduce the negative consequences of the current crop specialisation and monoculture system through nutrient recycling. Technology has been introduced in Indian agriculture after the green revolution and it has transformed it. Increasing population, limited supply of land, small size of land holdings and limited irrigation have impacted agricultural growth recently. Technological development in agriculture, new varieties of seeds, changing infrastructure and high levels of exploitation of irrigation sources have forced the cultivation of different crops (De K., 2000). One of the problems Indian farmers faces in decision-making is about the choice of crop and the profitable level of crop diversification. How can they make the optimum profit level with their limited plots? We have realised that we need to give more importance to long-term returns, and crop diversification can give sustainable income to farmers and maintain soil health. We have analysed the crop diversification through the crops cultivated during a year and the crop cultivation frequency during a year.

Table 6 9: Frequency of crop cultivation

Crop cultivation frequency	M	SE	SD	M	SE	SD	t value	Mean diff	Sig. (1 tailed)
CSR & non-CSR	CSR			Non-CSR					
No. of crops in 2016-17	2.16	1.08	0.08	2.12	1.16	0.09	0.35	0.04	0.365
No. of crops in 2020-21	4.7	2.13	0.15	2.72	1.53	0.12	10.23	1.98	0.000
Crop cultivation frequency in 2016 17	1.2	0.4	0.03	1.22	0.43	0.03	-0.44	-0.02	0.331
Crop cultivation frequency in 2020 21	1.86	0.42	0.03	1.34	0.49	0.04	10.87	0.52	0.000
Intra-CSR	CSR-IP			CSR-NIP					
No. of crops in 2016-17	2.21	1.11	0.09	1.79	0.78	0.16	1.79	0.42	0.038
No. of crops in 2020-21	5.09	1.95	0.15	1.92	0.93	0.19	13.14	3.17	0.000
Crop cultivation frequency in 2016 17	1.23	0.42	0.03	1	0	0	7.09	0.23	0.000
Crop cultivation frequency in 2020 21	1.98	0.29	0.02	1.04	0.2	0.04	15.41	0.93	0.000
Intra-irrigation	CSR-MI			CSR-NMI					
No. of crops in 2016-17	2.22	1.14	0.1	2.19	1.02	0.16	0.14	0.03	0.444
No. of crops in 2020-21	5.53	1.87	0.17	3.74	1.52	0.23	5.62	1.79	0.000
Crop cultivation Frequency in 2016 17	1.23	0.43	0.04	1.21	0.42	0.06	0.27	0.02	0.395
Crop cultivation frequency in 2020 21	2.01	0.27	0.02	1.88	0.33	0.05	2.27	0.13	0.014

Source: Author's calculation based on the field survey (2022).

Table 6.9 reports the mean distribution of CSR and non-CSR villages by the number of crops and crop cultivation frequency. The mean difference of the number of crops between CSR, CSR-IP, CSR-MI and non-CSR, CSR-NIP and CSR-NMI was 2.16 ha, 2.21 ha, 2.22 ha

and 2.12 ha, 1.79 ha and 2.19 ha respectively in 2016-17. The mean difference of crop cultivation frequency between CSR, CSR-IP, CSR-MI and non-CSR, CSR-NIP and CSR-NMI was 1.2 ha, 1.23 ha, 1.23 ha and 1.22 ha, 1.00 ha, 1.21 ha respectively in 2016-17. The mean difference of the number of crops between CSR, CSR-IP, CSR-MI and non-CSR, CSR-NIP and CSR-NMI was 4.7, 5.09, 5.53 and 2.72, 2.92 and 3.74 respectively in 2020-21. The mean difference of crop cultivation frequency between CSR, CSR-IP, CSR-MI and non-CSR, CSR-NIP and CSR-NMI was 1.86, 1.98, 2.01 and 1.34, 1.04 and 1.88 respectively in 2020-21.

A t-test examined the difference between CSR, CSR-IP, CSR-MI, and non-CSR, CSR-NIP and CSR-NMI. The difference between them was significant in 2020-21 but was not significant in 2016-17. In both CSR and non-CSR villages, farmers had a similar number of crops and crop cultivation frequency (2016-17), but after intervention (2020-21), farmers in CSR villages had both significantly higher number of crops as well as substantially higher cultivation frequency. Farmers with irrigation had greater crop variety as well as cultivation frequency even before the intervention This shows the importance of CSR activity in villages.

Farmers in CSR villages used to cultivate only 2.16 crops during 2016-17, but they cultivated 4.7 crops in 2020-21 which was double. Before the intervention, maximum cultivation was in the kharif season, and limited cultivation in the rabi season. Therefore, only a few crops such as cotton and maize were produced in CSR and non-CSR villages. After the intervention, crops like tomato, onion, ginger and vegetables began to be produced in both the seasons which has led to an increase in the mean crop cultivation in CSR villages, but no change in non-CSR villages (it was 2.12 in 2016-17 and 2.72 in 2020-21 in non-CSR villages). In short, irrigation and water availability are crucial to promote crop diversification.

6.2.5.6 Crop diversification index

Due to differences in agroclimatic conditions and agricultural resource endowment, crop diversity levels vary by location (Kalamkar, 2001). Crop diversification is regarded as a crucial agrarian development path. It entails moving resources from low-value to high-value agriculture and growing a wider range of crops within a given geographic area over time. (De U., 2000) We have calculated crop diversification indices based on field survey data conducted in 2022. We have done comparative analysis between CSR and non-CSR villages. Based on Table 6.10, we have assessed the impact of CSR activity on crop diversification. The extent of diversification or conservation is evaluated by using several indices. Numerous studies have been done on crop diversification (Kalamkar, 2003; De U., 2000; Kumar, 2020; Biswas, R., 2016; Dube, L., 2016; Nayak & Kumar, 2019).

- **Herfindahl Index (HI)**

It measures crop diversity. It is calculated by adding the squares of each crop's acreage share of the total cropped area. As the number of crops increases, it approaches zero. To enable comparisons with other variables in the positive direction, it is transformed by subtracting 1(1-HI). Hence, the transformed Herfindahl Index ranges from 0 indicating no diversity to 1 indicating perfect diversity in terms of the number of crop types sown in a farm.

The formula for HI is as follows:

$$HI = \sum_{i=1}^N Pi^2$$

Where, $Pi = Ai / \sum Ai$

Where Ai = Area under i th crop, $\sum Ai$ = total cropped area, N = total no. of crops

The value of the HI index varies from zero to one. The HI value is bounded by 0 (complete diversification) and 1 (entire specialisation). HI has a value of one when just one crop is grown and becomes closer to zero as N spreads. The index's main drawback is its inability to accept the theoretical minimum value or zero for lower N values such as when fewer crops are cultivated. As an indicator of concentration, the index differs from unity representing diversity. Another justification for this is to make it comparable to other indices.

Table 6 10: Crop Diversification Index

Crop Diversification Index	M	SE	SD	M	SE	SD	t value	Mean diff	Sig. (1 tailed)
CSR & non-CSR	CSR			Non-CSR					
Herfindahl Index, 2020-21	0.68	0.21	0.01	0.44	0.28	0.02	8.75	0.23	0.000
Modified Entropy Index, 2020-21	0.89	0.23	0.02	0.69	0.41	0.03	5.72	0.20	0.000
Composite Entropy Index, 2020-21	0.67	0.2	0.01	0.45	0.28	0.02	8.59	0.22	0.000
Intra-CSR	CSR-IP			CSR-NIP					
Herfindahl Index, 2020-21	0.73	0.13	0.01	0.32	0.26	0.05	7.46	0.41	0.000
Modified Entropy Index, 2020-21	0.93	0.12	0.01	0.57	0.46	0.09	3.85	0.36	0.001
Composite Entropy Index, 2020-21	0.72	0.13	0.01	0.32	0.26	0.05	7.25	0.40	0.000
Intra-irrigation	CSR-MI			CSR-NMI					
Herfindahl Index, 2020-21	0.76	0.1	0.01	0.64	0.18	0.03	4.08	0.12	0.000
Modified Entropy Index, 2020-21	0.94	0.05	0	0.9	0.21	0.03	1.39	0.05	0.086
Composite Entropy Index, 2020-21	0.75	0.09	0.01	0.64	0.17	0.03	3.98	0.11	0.000

Source: Author's calculation based on the field survey (2022).

In Table No. 6.10, transformed values (1- Index) are used for direct comparison. The value is one (1) in the case of perfect specialisation and zero (0) in the case of perfect diversification. The value rises as diversification increases and falls to 0 (zero) in the event of perfect concentration which occurs when only one crop is grown. Crop diversification has been analysed in Table 6.10. Significant differences were found in the HI index in CSR and non-CSR villages. There were statistically significant differences between them. The mean value of HI in CSR was 0.62 and 0.44 in non-CSR villages. The mean difference was 0.18. The mean value near one show more crop diversification and the value near zero shows less diversification. More crop diversification was found in CSR villages.

The mean HI for CSR-IP was 0.73 and CSR-NIP was 0.32. The difference in mean HI was 0.4. Farmers with irrigation facility HI were higher than all CSR farmers, which means irrigation promotes crop diversification. The difference was statistically significant for CSR-IP and CSR-NIP. We have also analyzed the difference between CSR-MI and CSR-NMI and tried to understand the role of micro-irrigation adoption in crop diversification. The mean HI for CSR-MI was 0.76 and for CSR-NMI it was 0.64. A t-test was conducted to determine whether there was a difference between CSR-MI farmers and CSR-NMI farmers from CSR villages. Results indicate significant differences in the HI levels of CSR-MI farmers and CSR-NMI farmers. Crop diversification is found in farmers with irrigation facilities and those adopting micro-irrigation. Farmers who have irrigation cultivate multiple crops including rabi and summer which reflects more diversification. HI for CSR-MI adopters was higher than for farmers from CSR villages and CSR farmers with irrigation facilities. (HI for CSR-MI- 0.76, CSR-IP-0.73 and CSR-0.62). We can conclude that only irrigation facilities are not crucial, but water management is important to improve crop diversity for sustainable agriculture growth.

- **Modified Entropy Index (MEI)**

It is subject to numerous limitations. There is no standard scale for assessing the degree of diversification it corresponds to. Consequently, we have used MEI to assess crop diversification. MEI uses the number of crops as the logarithm's basis. Because of its logarithmic nature, it is thought of as an inverse measure of concentration. The MEI uses a variable logarithm base. It measures the deviations from equal distribution of cropped area proportions. However, it does not incorporate the number of crops. As the proportions of areas for each crop become more uniform, the index approaches the value of 1.

The formula for MEI is as follows:

$$MEI = \sum_{i=1}^N (P_i \cdot \log_N P_i)$$

When only one crop is grown, or total concentration, the index's lower and higher values are zero and one respectively, denoting perfect diversification. It also indicates how far current crops have deviated from being distributed equally. It is nevertheless more beneficial than EI. It does not take into account the change in value brought about by variations in the number of crop activities because of the homogeneity of scale. This information can be utilised as a weight to examine various situations with varying numbers of activities (De U., 2000; Shiyani & Pandya, 1998). Since the same number of significant crops is always considered in the analysis, changes in the number of crops are not included in the MEI calculation.

Crop diversification has been analysed in Table 6.10. The mean MEI for CSR villages was 0.89 and for non-CSR villages 0.69. The mean difference was 0.20. The study employed a t-test to find out if the MEI of CSR and non-CSR farmers differed significantly. Results indicate significant differences in the MEI levels of CSR and non-CSR farmers. The mean value near one shows more crop diversification and the value near zero shows less diversification. We can conclude that the higher MEI was in CSR villages than in non-CSR villages. Table 6.10 analyses the difference between CSR-IP and CS-NIP in MEI. The mean MEI for CSR-IP was 0.93 and for CSR-NIP, 0.57. The mean difference was 0.36. A t-test was conducted to determine whether there was a significant difference in MEI between CSR-IP and CSR-NIP farmers. Results indicate significant differences in the MEI levels of CSR-IP and CSR-NIP farmers. The mean value near one show more crop diversification and the value near zero shows less diversification. We can conclude that the higher MEI was in CSR-IP than in CSR-NIP farmers.

The mean of MEI for CSR-MI was 0.94 and for CSR-NMI, it was 0.9. A t-test was conducted to determine whether there was a difference between CSR-MI farmers and CSR-NMI farmers from CSR villages. Results indicate no significant difference in the MEI levels of CSR-MI farmers and CSR-NMI farmers. MEI for CSR-MI adopters was higher than for farmers from CSR villages and CSR farmers with irrigation facilities. (MEI for CSR-MI- 0.94, CSR-IP-0.93 and CSR-0.89). We can conclude that irrigation facilities are not crucial, but water management is important for improving crop diversity and promoting sustainable agricultural growth. Results for CSR-MI and CSR-NMI for HI and MEI showed differences.

- **Composite Entropy Index (CEI)**

It includes all the features required for the Modified Entropy Index. It examines various scenarios with changing and high activity levels, assigning the number of activities the weight they deserve (Shiyani & Pandya, 1998). It possesses all the desirable properties of the MEI. It is used to compare diversification across situations with different and large numbers of activities as it gives due weight to the number of activities, in our case, the types of crops. The CEI's value increases as the number of crops or activities increases and decreases with concentration.

The formula for MEI is as follows:

$$C.E.I. = - \left(\sum_{i=1}^N P_i \cdot \log P_i \right) * \{1 - (1/N)\}.$$

or

$$C.E.I. = (\text{Modified Entropy Index}) * \{1 - (1/N)\}.$$

Since both of the index's components have zero and one bounds, the CEI's value falls between the zero and one. The index gives smaller quantities more weight and greater amounts less weight since it employs $\log P$ with base N as weights.

Crop diversification has been analyzed in Table 6.10. The mean CEI for CSR villages was 0.67 and for non-CSR villages 0.45. The mean difference was 0.22. A t-test was conducted to determine whether there was a significant difference in CEI between CSR and non-CSR farmers. Results indicate significant differences in the CEI levels of CSR and non-CSR farmers. The mean value near one indicates more crop diversification, while the value near zero indicates less diversification. We can conclude that the higher CEI was in CSR villages than in non-CSR villages. Table 6.10 analyses the difference between CSR-IP and CS-NIP in CEI. The mean CEI for CSR-IP was 0.72, and for CSR-NIP, it was 0.32. The mean difference was 0.40. A t-test was conducted to determine whether there was a significant difference in CEI between CSR-IP and CSR-NIP farmers. Results indicate significant differences in the CEI levels between CSR-IP and CSR-NIP farmers. The mean value near one indicates more crop diversification, while near zero indicates less diversification. We can conclude that the higher CEI was in CSR-IP than in CSR-NIP farmers.

The mean of CEI for CSR-MI was 0.75, and for CSR-NMI, it was 0.64. A t-test was conducted to determine whether there was a difference between CSR-MI farmers and CSR-NMI farmers from CSR villages. Results indicate significant differences in the CEI levels of CSR-MI farmers and CSR-NMI farmers. CEI for CSR-MI adopters was higher than for farmers from CSR villages and CSR farmers with irrigation facilities. (CEI for CSR-MI: 0.75, CSR-IP:

0.72, and CSR: 0.67). We can conclude that irrigation facilities and effective water management are crucial for enhancing crop diversity and promoting sustainable agricultural development.

A similar study found a positive correlation between irrigation and crop diversification indicating that irrigation significantly affects farmers' crop diversity (Nayak & Kumar, 2019; Rahman & Kazal, 2015; Biswas, 2016; Kumar, 2020). Like parts of western India, regions with assured irrigation showed greater crop diversification, especially into fruits, vegetables and cash crops (Joshi et al. ,2004). BIRTHAL et al. (2006) noted that better water access enabled smallholders to move away from cereal-dominated systems to more diverse and profitable cropping patterns. Some studies have yielded contradictory results regarding the effects of irrigation and crop diversification. Basantaray and Nancharaiah (2017) found an inverse relationship between the irrigated land and crop diversification. In the case of Odisha, paddy is a dominant and water-intensive crop. Irrigated land is mainly used for its cultivation. As a result, there is less irrigated land than there is crop diversity. Sanjive, K. & Sakshi, G. (2015) have observed that the impact of gross irrigated area (GIA) was not statistically significant on the Simpson Index of Crop Diversification (SID). In states with irrigation, farmers typically grow more income crops than traditional crops like rice and wheat. Annual rainfall and cropping intensity significantly impact the SID. Chand and Chauhan (2002) observed that in highly irrigated areas like Punjab and Haryana, farmers specialise in water-intensive crops like rice and wheat, resulting in lower crop diversification (i.e., a higher Herfindahl Index). This trend, often driven by policy incentives like minimum support prices, discourages diversification despite water availability.

However, we can conclude that if abundant water is available for agriculture, crop concentration occurred in Odisha for paddy, Punjab for wheat and western Maharashtra for sugarcane. Farmers cultivate high-water-consuming crops when water is abundant and available. Crop diversity occurs when water is available but in limited quantities. Farmers use water effectively and produce multiple crops.

6.2.5.7 Crop production

The distribution and share of crop production give an idea of the pace of agricultural growth. Results obtained from the primary study are presented in Table 6.11. The total production of crops in CSR villages was higher than in non-CSR villages. The mean difference between K onion, K tomato, R onion, and ginger was higher in CSR and non-CSR villages.

The mean production for K maize, K ginger, K onion, K tomato, and R gram of commercial crops, such as cotton, ginger, onion, and tomato, was higher among non-CSR farmers. The difference between CSR and non-CSR farmers' mean production levels of K maize, K tomato and R gram was statistically significant. Mean production level per crop is not significantly higher, although total production levels are higher in CSR villages.

Table 6 11: Crop production

Production in quintal	Total for CSR	Total for Non-CSR	Mean	SE	SD	Mean	SE	SD	t value	Mean diff	Sig. (1 tailed)
Crops			CSR			Non -CSR					
K Maize	4987.5	2333	30.41	24	1.87	24.3	23.32	2.38	2	6.11	0.023
K Cotton	2176	1998.5	12.8	8.41	0.64	12.81	10.58	0.85	-0.01	-0.01	0.504
K Ginger	4918	1977	67.41	43.37	5.04	63.97	45.61	8.06	0.37	3.44	0.357
K Tur	210	180.5	5.68	3.94	0.65	5.82	4.79	0.86	-0.14	-0.15	0.555
K Onion	3695	460	123.17	116.87	21.34	65.71	27.15	10.26	1.28	57.45	0.105
K Bajra	60	20	6	2.45	0.77	4	2.55	1.14	1.47	2	0.083
K Tomato	9238.6	2518	130.12	103.44	12.28	89.93	72.47	13.7	1.88	40.19	0.032
K Other vegetables	62	160	18	14.13	4.71	32	11.51	5.15	-1.88	-14	0.958
K Soyabean	88	52.5	6.77	3.22	0.89	10.5	6.75	3.02	-1.19	-3.73	0.854
R Gram	572.5	104.5	8.95	6.74	0.84	4.35	2.3	0.47	4.76	4.59	0.000
R Jowar	213	107	8.88	6.05	1.23	13.38	10.47	3.7	-1.51	-4.5	0.929
R Maize	631	102	33.21	16.88	3.87	25.5	16.76	8.38	0.83	7.71	0.208
R Onion	5330	180	108.78	100.68	14.38	45	15.81	7.91	1.25	63.78	0.108
R Wheat	1902	355	16.98	11.33	1.07	13.65	9.71	1.9	1.38	3.33	0.085
Mosambi	500	1230	59.17	47.38	13.68	125.85	98.31	31.09	-1.96	-66.68	0.964

Source: Author's calculation based on the field survey (2022).

The production of cash crops (cotton, tomatoes, onions and vegetables) was higher. The expansion of irrigation in CSR villages has positively impacted crop production. Soil and water conservation, water resources management, farmers' training and awareness programmes on sustainable agriculture such as soil testing and using water technology by JBGVS have significantly improved agricultural production. Similar studies have found a positive relationship between production and availability of irrigation infrastructure (Dhawan, 1989; Narayanamoorthy et al., 2018). Rashida et al. (2009) revealed that proper water management enhances the production and productivity of the agricultural sector.

6.2.5.8 Crop productivity

The ratio of agricultural outputs to inputs is known as agricultural productivity. The entire quantity of plant production each year is measured by crop productivity known as yield. This quantifies crop yield in a specific field area. According to Kalamkar, S. (2008), during the

second phase of the Green Revolution, the productivity growth rate of practically all significant crops either decreased or remained unchanged. Productivity in Marathwada is lower than the national average. The declining productivity of most crops is a critical issue, underscoring the need to improve crop yields. We have assessed the impact of CSR activity on productivity in Table 6.12.

Table 6 12: Crop productivity

Productivity in quintal per ha	Total for CSR	Total for non-CSR	Mean	SE	SD	Mean	SE	SD	t value	Mean diff	Sig. (1 tailed)
Crop			CSR			Non-CSR					
K Maize	48.4	35.7	49.6	15.9	1.2	37.2	15.7	1.6	6.11	12.4	0.000
K Cotton	15.5	13.2	15.8	5.5	0.4	14.2	6.6	0.5	2.42	1.62	0.008
K Ginger	170.2	125.9	176.4	58.0	6.7	143.6	64.1	11.3	2.59	32.8	0.006
K Tur	13.8	12.0	14.4	6.1	1.0	11.7	5.2	0.9	2	2.78	0.025
K Onion	339.0	179.0	305.7	136.2	24.9	180.3	61.6	23.3	2.36	125.36	0.012
K Bajra	18.2	13.3	21.4	7.7	2.4	14.5	6.2	2.8	1.73	6.88	0.054
K Tomato	340.2	239.8	342.8	158.8	18.9	259.1	180.6	34.1	2.27	83.72	0.013
K Other Vegetable	21.4	72.7	53.3	21.1	7.0	125.0	91.9	41.1	-1.72	-71.67	0.922
K Soyabean	14.2	17.5	15.0	5.3	1.5	16.9	8.2	3.7	-0.58	-1.88	0.716
R Gram	16.9	9.3	17.1	5.6	0.7	10.4	6.4	1.3	4.82	6.71	0.000
R Jowar	20.5	18.4	21.2	9.3	1.9	18.2	10.0	3.5	0.79	3.05	0.219
R Maize	53.7	39.2	54.8	15.9	3.7	44.2	14.8	7.4	1.22	10.59	0.118
R Onion	294.5	171.4	285.6	76.0	10.9	175.0	21.5	10.8	2.88	110.58	0.003
R Wheat	33.5	27.6	33.9	11.0	1.0	29.2	9.3	1.8	2.04	4.77	0.022
Mosambi	78.1	136.2	131.3	128.4	37.1	131.3	61.4	19.4	0	-0.07	0.501

Source: Author's calculation based on the field survey (2022).

Crop productivity has been analysed in Table 6.12. The mean productivity of K Maize, K cotton, K ginger, K tuar, K onion, K bajra, K tomato, R gram, R onion and R wheat was higher in CSR villages than in non-CSR villages. A t-test was conducted to determine whether CSR and non-CSR farmers significantly differed in productivity. Results indicated significant differences in their productivity levels. Higher productivity was observed for K maize, K tuar, R wheat and cash crops K cotton, K ginger, K onion, K tomato, R gram and R onion. The mean productivity of mosambi was higher in non-CSR villages than in CSR villages. These differences in crop productivity between CSR and non-CSR areas indicate that the area under irrigation increased crop productivity per unit area more effectively in CSR villages than in non-CSR villages. Studies have found a positive relationship between productivity and the availability of irrigation infrastructure (Dhawan, 1989; Narayanamoorthy et al., 2018; Dunusinghe, 2021).

6.2.5.9 Net annual income

It is impossible to overstate the value of water as a resource for agriculture. The world's irrigation system is expanding quickly due to the increased demand for crop production to feed the expanding population. Irrigation can increase production and productivity in India. Farmers leave the agricultural profession as agriculture is not a profitable business. Table 6.13 assesses how CSR activities have made a difference in the income of CSR village farmers. The impact of irrigation on annual net income at the farm level is presented in it. The average NAI for CSR farmers was ₹187,351 and for non-CSR farmers ₹118,792. A t-test was applied to determine whether there was a significant difference in NAI between CSR and non-CSR farmers. The average NAI of CSR farmers was significantly higher than that of non-CSR farmers. We have also assessed the impact of irrigation on farmers' income based on the type of farmers. We have checked whether there were any variations in farmers' income based on their landholding in CSR and non-CSR villages. The study found that the mean NAI of marginal farmers, small farmers, semi-medium farmers and medium farmers was higher in CSR villages than in non-CSR villages. A t-test was used to determine if the mean NAI of CSR and non-CSR farmers differed significantly. Small, medium, semi-medium, and CSR-marginal farmers all had average NAI that were noticeably greater than those of non-CSR farmers.

We have also assessed the impact of irrigation on farmers' income (component-wise) based on the agri-component. We have checked whether there were any variations in farmers' income based on the agri-component-wise in CSR and non-CSR villages. The study found that the mean NAI of the agricultural sector and agri-allied sector was higher in CSR villages than in non-CSR villages. A t-test was applied to determine whether there was a significant difference in mean NAI between CSR and non-CSR farmers. The average NAI of the agriculture and agri-allied sectors was significantly higher in CSR villages than in non-CSR villages. The other sectors' mean NAI difference between CSR and non-CSR was insignificant. Other sectors include income from business, salary and daily wage labour. The difference between CSR and non-CSR farmers has been assessed based on the mean NAI across agri-allied sectors. Mean NAI from the dairy and other agri-allied sectors was statistically significantly higher in CSR villages than in non-CSR villages. Income from goats was statistically significantly higher in CSR villages. This is because the NT-C (Dhangar community) population was higher in non-CSR villages than in CSR villages. A total of 21 households in the NT category were included in this study. Goat farming is the main occupation

of the NT-C community. The impact of irrigation on annual net income at the farm level is presented in Table 6.13.

Table 6 13: Net annual income, 2020-21

Net annual income	Mean	SE	SD	Mean	SE	SD	t value	Mean diff	Sig. (1 tailed)
CSR & non-CSR	CSR			Non-CSR					
Total NAI	187351	167762	12044.61	118792	138628	10695.38	4.26	68558.85	0.000
Marginal farmers NAI	96161	68788.95	9192.31	66306	32414.12	4630.59	2.9	29854.59	0.003
Small farmers NAI	161889	113056.8	13323.88	108635	142706.4	17979.31	2.42	53253.97	0.009
Semi-medium farmers NAI	235909	130200.2	17556.19	154065	171604.1	25301.65	2.72	81843.87	0.004
Medium farmers NAI	580500	341064.1	107853.9	260778	108468.6	36156.21	2.81	319722.2	0.009
NAI from agriculture sector	131139	123396	8859.32	80101	61025.04	4708.18	5.09	51037.98	0.000
NAI from agri-allied sector	23871	35849.27	2573.83	6065	16881.82	1302.46	6.17	17805.66	0.000
NAI from non-agri sector	32340	86693	6224.19	32625	122175.7	9426.06	-0.03	-284.79	0.490
Net annual income through the agricultural allied sector									
NAI dairy	18304	27919.67	2004.52	3851	13043.75	1006.35	6.44	14452.93	0.000
NAI goat	4582	21282.36	1527.98	2185	9781.22	754.64	1.41	2397.95	0.081
NAI Other agri-allied	985	4584.81	329.17	30	385.76	29.76	2.89	954.77	0.002
Intra-CSR	CSR-IP			CSR-NIP					
Total NAI	202377	173058.4	13272.98	80917	51132.32	10437.34	7.19	121459.8	0.000
NAI from the agricultural sector	142053	127821.5	9803.46	53833	24558.12	5012.91	8.01	88219.61	0.000
NAI from agri-allied sector	26241	37374.89	2866.52	7083	13586.81	2773.4	4.8	19157.84	0.000
NAI from non-agri sector	34082	90663.39	6953.56	20000	49869.39	10179.55	0.74	14082.35	0.229
NAI from dairy	20241	29062.58	2229	4583	10520.86	2147.56	5.06	15657.84	0.000
NAI goat	4876	22512.11	1726.6	2500	8469.9	1728.91	0.51	2376.47	0.305
NAI other agri-allied	1124	4883.5	374.55	0	0	0	3	1123.53	0.002
Intra-irrigation	CSR-MI			CSR-NMI					
Total NAI	232055	185632.1	16407.71	111929	74695.28	11525.73	5.99	120126.1	0.000
NAI from the agricultural sector	163977	138616.3	12252.07	75238	41883	6462.69	6.41	88738.47	0.000
NAI from agri-allied sector	29078	39905.72	3527.2	17595	26896.42	4150.21	1.74	11482.89	0.042
NAI from non-agri sector	39000	99213.28	8769.3	19095	55552.57	8571.95	1.62	19904.76	0.054
NAI dairy	22047	30392.93	2686.38	14738	24062.99	3713	1.42	7308.78	0.079
NAI goat	6086	25695.07	2271.14	1190	5037.61	777.32	2.04	4895.46	0.022
NAI Other agri-allied	945	3998.64	353.43	1667	6955.14	1073.2	-0.83	-721.35	0.796

Source: Author's calculation based on the field survey (2022).

The average NAI for CSR-IP farmers was ₹ 2,02,377 and for CSR-NIP farmers, ₹ 80,917. The average NAI of CSR-IP farmers was significantly higher than that of CSR-NIP farmers. We have also assessed the impact of irrigation on farmers' component-wise income

based on the agri-components. We have checked whether there were variations in farmers' income based on the agri-components in CSR and non-CSR villages. The mean NAI of the agricultural sector and agri-allied sector was higher in CSR-IP villages than in CSR-NIP villages. The mean NAI of CSR-IP and CSR-NIP farmers was compared using a t-test to find out if there was a significant difference. The average NAI of the agricultural sector and agri-allied sector was higher in CSR-IP villages than in CSR-NIP villages. The mean difference of CSR-IP and CSR-NIP for the other sectors was not statistically significant. Although the number of cows was not higher for farmers with irrigation facilities, the income from dairy farming was higher. Other sectors include income from business, salary and daily wage labour. Farmers from CSR-NIP work as labourers and, therefore, the contribution of wages was higher in their total income. The impact of irrigation on annual net income at the farm level is presented in Table 6.13. The average NAI for CSR-MI farmers was ₹2,32,055, while for CSR-NMI farmers it was ₹111,929. The average NAI of CSR-MI farmers was higher than that of CSR-NMI farmers.

We have also assessed the impact of irrigation on farmers' component-wise income based on the agri-components. We checked whether there were variations in farmers' income in CSR-MI and CSR-NMI farmers based on the agri-component-wise. The study found that the mean NAI of the agriculture and agri-allied sectors was higher in CSR-MI villages than in CSR-NMI villages. A t-test was conducted to determine whether there was a significant difference in mean NAI between CSR-MI and CSR-NMI farmers. The average NAI of the agricultural sector and agri-allied sector was higher for CSR-MI farmers than for CSR-NMI farmers. The other sectors' mean difference between CSR-MI and CSR-NMI was insignificant. They include income from business, salary and daily wage labour.

The mean NAI for CSR farmers was ₹187,351, while the mean NAI for CSR-IP and CSR-MI was ₹2,02,377, and ₹2,32,055 respectively shows a difference in their mean NAI. Farmers from CSR village who have irrigation facilities and have adopted micro-irrigation have the highest mean NAI compared with others. Irrigation was a crucial factor for farmers' income. Many studies (Mishra, 2023; Srilatha, 2023) have discovered that access to irrigation is crucial for farm income. Tesfayohannes et al. (2022) found that irrigation significantly increased household income, highlighting its role in improving rural livelihoods. Similarly, Karlberg et al. (2015) observed that access to irrigation had a greater impact on farm income than crop selection or agricultural water intensity (AWI) with irrigated farms benefiting more from AWI than non-irrigated ones. Farmers who adopted sustainable soil and water

conservation practices saw increased crop yield and revenue. (Mamush et al., 2021). Farmers' incomes are positively and significantly impacted by WUA, according to the regression of WUA membership on income (Kailash, 2023). The study of Yital, A. (2014) reveals that soil and water conservation interventions may not significantly impact crop productivity and farmers' income.

6.2.5.10 Employment

According to the census of 2011, 54.6 per cent of the population depended on the agricultural sector. Although the share of agriculture and allied sectors in GDP is decreasing, dependence on agriculture for employment remains high. Chhatrapati Sambhajnagar is an industrially developed district, yet unemployment and migration remain crucial. Water scarcity, unskilled labour, inadequate infrastructure facilities in villages, traditional agriculture, lack of agricultural market knowledge and backward dairy and allied agricultural sectors are primary characteristics of villages in Chhatrapati Sambhajnagar.²⁸ We have evaluated the impact of CSR activities on employment generation. Table 6.14 presents employment data for CSR and non-CSR villages.

The impact of irrigation on employment is presented in Table 6.14. The mean number of external labourers per crop was doubled in CSR villages compared with non-CSR villages. The mean difference between them was 2.04. A t-test was conducted to determine whether there was a significant difference in the mean number of external laborers per crop between CSR and non-CSR farmers. The mean number of external laborers per crop of CSR farmers was higher than that of non-CSR farmers. The mean of total external labor days per crop and total family labor days per crop was statistically higher in CSR villages than in non-CSR villages. The mean of family labor per crop and family labor per day was higher in CSR-MI farmers than in CSR farmers. The lower mean of family labour per crop is because the population or family size cannot be changed due to improvements in irrigation. However, the same persons can work more days and we observed this pattern in CSR villages. We have also assessed the impact of irrigation on employment-based CSR-MI and CSR-NMI farmers. The mean number of external labourers per crop was doubled in CSR-MI farmers compared with CSR-NMI farmers. The mean difference between them was 2.3. A t-test was conducted to determine whether there was a significant difference in the mean number of external labourers per crop between CSR-MI and CSR-NMI farmers. The mean number of external labourers per

²⁸ Socio-economic Survey of Chhatrapati Sambhajnagar District, 2024.

crop of CSR-MI farmers was significantly higher than that of CSR-NMI farmers. The mean of total external labour days per crop and total family labour days per crop was statistically higher for CSR-MI farmers than CSR-NMI farmers.

Table 6 14: Employment

Employment	Mean	SE	SD	Mean	SE	SD	t value	Mean diff	Sig. (1 tailed)
CSR & non-CSR	CSR			Non-CSR					
Maximum number of external labourers per crop	3.33	5.41	0.39	1.29	1.77	0.14	4.96	2.04	0.000
Maximum number of family labourers per crop	3.23	1.56	0.11	2.89	2.51	0.19	1.54	0.33	0.062
Maximum number of total external labour days per crop	201.59	129.77	9.32	157.45	86.65	6.68	3.85	44.14	0.000
Maximum number of total family labour days per crop	107.45	475.4	34.13	21.33	46.38	3.58	2.51	86.12	0.006
Intra-CSR	CSR-IP			CSR-NIP					
Maximum number of external labourers per crop	3.64	5.66	0.43	1.17	2.06	0.42	2.11	2.47	0.018
Maximum number of family labourers per crop	3.29	1.53	0.12	2.79	1.74	0.36	1.46	0.5	0.073
Maximum number of total external labour days per crop	205.66	122.33	9.38	172.71	174.2	35.56	1.17	32.96	0.122
Maximum number of total family labour days per crop	120.63	506.52	38.85	14.13	30.1	6.14	1.03	106.5	0.152
Intra-irrigation	CSR-MI			CSR-NMI					
Maximum number of external labourers per crop	4.2	6.33	0.56	1.9	2.07	0.32	3.57	2.3	0.000
Maximum number of family labourers per crop	3.43	1.55	0.14	2.86	1.41	0.22	2.12	0.57	0.017
Maximum number of total external labour days per crop	217.21	130.22	11.51	170.48	86.47	13.34	2.17	46.73	0.015
Maximum number of total family labour days per crop	152.96	580.42	51.3	22.1	28.36	4.38	2.54	130.87	0.006

Source: Author's calculation based on the field survey (2022).

The mean of family labour per crop was higher in CSR-MI villages than in CSR-NMI farmers. The mean of family labour per day was higher in CSR villages than in non-CSR villages. Many similar findings were found to support the above findings. Singh et al. (2017) reported that irrigation increased farm employment by 24 days in Bharuch district and 38 and 37 days for males and females respectively in Narmada district. Similarly, Pooja (2020) found that irrigation water deficits significantly affected annual household employment, especially in the middle-reach areas of the Tungabhadra basin. Bore wells and ponds served as

supplementary sources during water shortages. The study emphasized the need for better coordination among departments for effective water management.

6.2.5.11 Livestock

The dependence of a large population on agriculture has led to disguised unemployment in the agricultural sector. The small size of land holdings and lack of skills among rural labourers are critical issues in the rural areas of Marathwada. Dairy farming, livestock and the agri-allied sector contribute to addressing various issues in the rural economy. Small farms appear more efficient in production even under low-input conditions (Chen et al., 2015). Small farmers have a comparative advantage in livestock production over large farmers.²⁹ We have assessed the importance of livestock in the studied area. Based on livestock availability, we have compared CSR and non-CSR villages, as shown in Table 6.15. In India, the livestock industry is more pro-poor than the land sector, and it has a 1.4 times greater impact on reducing poverty than the agricultural sector. Women can own cattle with a small initial investment and increase their numbers through reproduction as property rights do not restrict livestock ownership. Women also receive a significant portion of the household budget for children's education, health and nutrition. Approximately 8 per cent of agricultural labour is employed in primary livestock production with more than 70 per cent being women (NABARD, 2022).

Table 6 15: Livestock

Variables & categories	CSR		Non-CSR		Total		Statistic test	Value	Sig. (2-tailed)
	Count	%	Count	%	Count	%			
Yes	151	77.8	97	57.7	248	68.5	Chi-Square	16.85	0.00
No	43	22.2	71	42.3	114	31.5	Fisher's Exact		0.00
Total	194	100	168	100	362	100			

Source: Author's calculation based on the field survey (2022).

While assessing livestock availability within the CSR and non-CSR villages, Table 6.15 displays that 77.8 per cent farmers in CSR villages and 68.5 per cent farmers in non-CSR villages had livestock. Availability of livestock was higher in CSR villages than in non-CSR villages. A Pearson's Chi-Square test results indicate a significant difference in the livestock availability of farmers from CSR and non-CSR villages. The increased availability of livestock suggests that CSR farmers' dependence was also heavily reliant on the agricultural sector. The mean NAI CSR farmers' share of the Agri-allied sector was 23,871 in CSR villages and 6,055

²⁹ Livestock, Agricultural Growth and Poverty Alleviation, NABARD Research and Policy Series No. 7/2022.

for non-CSR farmers. The difference was statistically significant. That means the role of the Agri-allied sector was significant in the total mean NAI of CSR farmers.

- **Types of livestock**

The type of livestock the farmers have is important for improving their income. Table 6.16 presents the types of livestock they had during the period. The mean of the total livestock count in CSR villages was 3.86, and in non-CSR villages 1.97 in 2020-21. The mean difference was 1.89. The mean of total livestock count was higher in CSR villages than in non-CSR villages. A t-test was conducted to examine the difference between villages with and without CSR benefits. The mean difference in total livestock count between CSR and non-CSR villages was statistically significant. This implies that the mean of the total livestock count in CSR villages was higher than in non-CSR villages.

Table 6 16: Types of livestock

Livestock	Mean	SE	SD	Mean	SE	SD	t value	Mean Diff	Sig. (1 tailed)
CSR & non-CSR	CSR			Non-CSR					
Total livestock count	3.86	8.34	0.6	1.97	2.86	0.22	2.79	1.89	0.003
Local cow count	0.46	0.66	0.05	0.62	0.73	0.07	-1.73	-0.15	0.043
Crossbred cow count	1.37	1.35	0.11	0.64	1.08	0.11	4.71	0.73	0.000
Intra-CSR	CSR-IP			CSR-NIP					
Total livestock count	4.18	8.82	0.68	1.54	2.17	0.44	1.46	2.64	0.074
Local cow count	0.48	0.67	0.06	0.3	0.48	0.15	0.81	0.18	0.210
Crossbred cow count	1.4	1.37	0.12	1	0.94	0.3	0.9	0.4	0.185
Intra-irrigation	CSR-MI			CSR-NMI					
Total livestock count	4.79	10.03	0.89	2.33	2.16	0.33	1.57	2.46	0.059
Local cow count	0.48	0.68	0.06	0.46	0.64	0.12	0.1	0.01	0.462
Crossbred cow count	1.45	1.4	0.13	1.18	1.28	0.24	0.94	0.27	0.174

Source: Author's calculation based on the field survey (2022).

The mean of local cow count in CSR villages was 0.46 and in non-CSR villages 6.62. The mean difference was -0.15. The mean of local cow count was higher in non-CSR villages than in CSR villages. A t-test was conducted to examine the difference between villages with and without CSR benefits. The mean difference in local cow count between them was insignificant. The mean number of cross-bred cows in CSR villages was 1.37, while in non-CSR villages it was 0.64. The mean difference was 0.73. The number of cross-bred cows was higher in CSR villages than in non-CSR villages. A t-test examined the mean difference in cross-breed cow count between CSR and non-CSR villages was statistically significant. This implies that the mean of cross-breed cow count in CSR villages was significantly higher than that in non-CSR villages. The higher mean of cross-breed cows indicates the development of

dairy farming in CSR villages. Livestock count and dairy farming improve the employability and income of the farmers. The mean NAI of dairy farming of CSR farmers was Rs. 18,304 and that of non-CSR farming was Rs. 3,851. The difference was statistically significant, and this improvement enhances the total NAI of farmers as evidenced by the mean NAI of CSR farmers being Rs. 1,87,351 and that of non-CSR farmers Rs. 1,18,792.

The mean of the total livestock count in CSR-IP villages was 4.18, but in CSR-NIP villages it was 1.54. Farmers with irrigation facilities present had more livestock, although the number of cows was not significantly higher. The mean difference in CSR-IP was not significantly higher for local and cross-bred cow counts. However, dairy farming depends on water availability in the villages. If water is available, dairy farming flourishes and vice versa.

6.2.6 Social factors

Various social factors have been considered to assess the relevance of CSR activity to agricultural growth. These include per capita food grain availability, food grain self-sufficiency and access to and availability of agriculture-related government policies such as schemes regarding crop intensity, crop diversity, crop patterns and farmers' incomes.

6.2.6.1 Per capita food grain availability

The per capita availability of foodgrains in terms of kilograms or quintals per year is calculated by dividing the net availability of foodgrains by the population for it. Achieving food security, eradicating hunger and the SDG that refers explicitly to nutrition is improved nutrition and sustainable agriculture (NABARD, 2022). India ranks 107th in the 2022 Global Hunger Index among 121 countries, scoring 29.1 placing it in the 'serious' category regarding hunger. Except Afghanistan, every other South Asian nation is ranked higher than India. In this light, food and nutrition security are essential dimensions as we strive for higher levels of development.³⁰ As a necessity, we have assessed the per capita availability of food grains in the studied villages. Table 6.17 represents per capita food grain availability. The mean total per capita food grain in CSR villages was 0.12 quintals, while in non-CSR villages, it was 0.07 quintals. The mean difference was 0.05 quintals. The total per capita foodgrain was higher in CSR villages than in non-CSR villages. A t-test was conducted to examine the difference between villages with and without CSR benefits. The mean per capita foodgrain difference

³⁰ Food and Nutritional Security in India, NABARD Research Study-35, 2022.

between CSR and non-CSR villages was statistically significant. This implies that the mean per capita foodgrain in CSR villages was higher than in non-CSR villages.

Table 6 17: Per capita food grain availability

Type	Mean	SE	SD	Mean	SE	SD	t value	Mean diff	Sig. (1-tailed)
CSR & non-CSR	CSR			Non- CSR					
Total per capita (as per village population) production per farmer in 2020-21	0.12	0.17	0.01	0.07	0.09	0.01	3.9	0.05	0.000
Intra-CSR	CSR-IP			CSR-NIP					
Total per-capita (as per village population) production per farmer in 2020-21	0.13	0.17	0.01	0.02	0.02	0	8.46	0.12	0.000
Intra-irrigation	CSR-MI			CSR-NMI					
Total per-capita (as per village population) production per farmer in 2020-21	0.16	0.19	0.02	0.07	0.08	0.01	4.05	0.09	0.000

Source: Author's calculation based on the field survey (2022).

We have also evaluated variations within CSR villages. The mean total per capita food grain in CSR-IP farmers was 0.13 q, and in CSR-NIP farmers 0.02 q. The mean total per capita foodgrain difference between CSR-IP and CSR-NIP farmers was statistically significant. This implies that the CSR-IP farmers' mean per capita foodgrain was higher than that of the CSR-NIP farmers. We have also evaluated variations within CSR villages. The mean per capita food grain in CSR-MI farmers was 0.16 q, and in CSR-NMI farmers 0.07 q. The mean total per capita foodgrain difference between CSR-MI and CSR-NMI farmers was statistically significant. This implies that the CSR-MI farmers' mean per capita foodgrain was higher than that of the CSR-NMI farmers. CSR farmers' mean total per capita food grain was 0.12 q., while the mean total per capita food grain for CSR-IP was 0.13 q. 0.16 q shows a difference in their mean total per capita food grain. Farmers from CSR villages who have irrigation facilities and have adopted micro-irrigation have the highest mean total per capita food grain compared compared with others.

Compared with Maharashtra and India, per capita foodgrain availability in CSR villages was less. This was because the area under cultivation of cotton, tomato, onion and ginger was higher in both sets of villages. Most farmers from non-CSR villages cultivate only cotton and maize. Due to the scarcity of water during the rabi season, only a few farmers do cultivation during this time. Low per capita food grain availability is alarming for villagers' food security.

6.2.6.2 Foodgrain self-sufficiency

We have assessed farmers' self-sufficiency in food grains. Nearly 69.1 per cent farmers in CSR villages reported being self-sufficient in food grains, while only 48.07 per cent of farmers were self-sufficient in food grains. The level of self-sufficiency in food grains among farmers in CSR and non-CSR villages differs significantly. To investigate the relationship between the type of village and the farmers' self-sufficiency in food grains, a chi-square test of independence was used. The relation between these variables was significant. This implies that statistical evidence suggests that more CSR farmers achieve self-sufficiency in food grains than non-CSR farmers. CSR farmers are more likely to report foodgrain self-sufficiency.

Table 6 18: Foodgrain self-sufficiency

Foodgrain self-sufficiency (as reported)	CSR		Non-CSR		Total		Statistic test	Value	Sig. (2-tailed)
	Count	%	Count	%	Count	%			
Yes	134	69.1	40	23.8	174	48.07	Chi-Square	73.89	0.000
No	60	30.9	128	76.2	188	51.93	Fisher's Exact		0.000
Total	194	100	168	100	362	100			

Source: Author's calculation based on the field survey (2022).

6.2.6.3 Knowledge of agri-related government schemes

The Governments of India and Maharashtra have been launching schemes to improve agricultural outcomes for farmers. The problems are high illiteracy, limited technological knowledge, small landholdings and lack of awareness among farmers regarding government schemes.

Table 6 19: Knowledge of farmers regarding agri-related government schemes

Knowledge of agriculture-related govt schemes	CSR		Non-CSR		Total		Statistic test	Value	Sig. (2-tailed)
	Count	%	Count	%	Count	%			
Yes	180	92.8	141	83.9	321	88.7	Chi-Square	7.03	0.008
No	14	7.2	27	16.1	41	11.3	Fisher's Exact		0.012
Total	194	100	168	100	362	100			

Source: Author's calculation based on the field survey (2022).

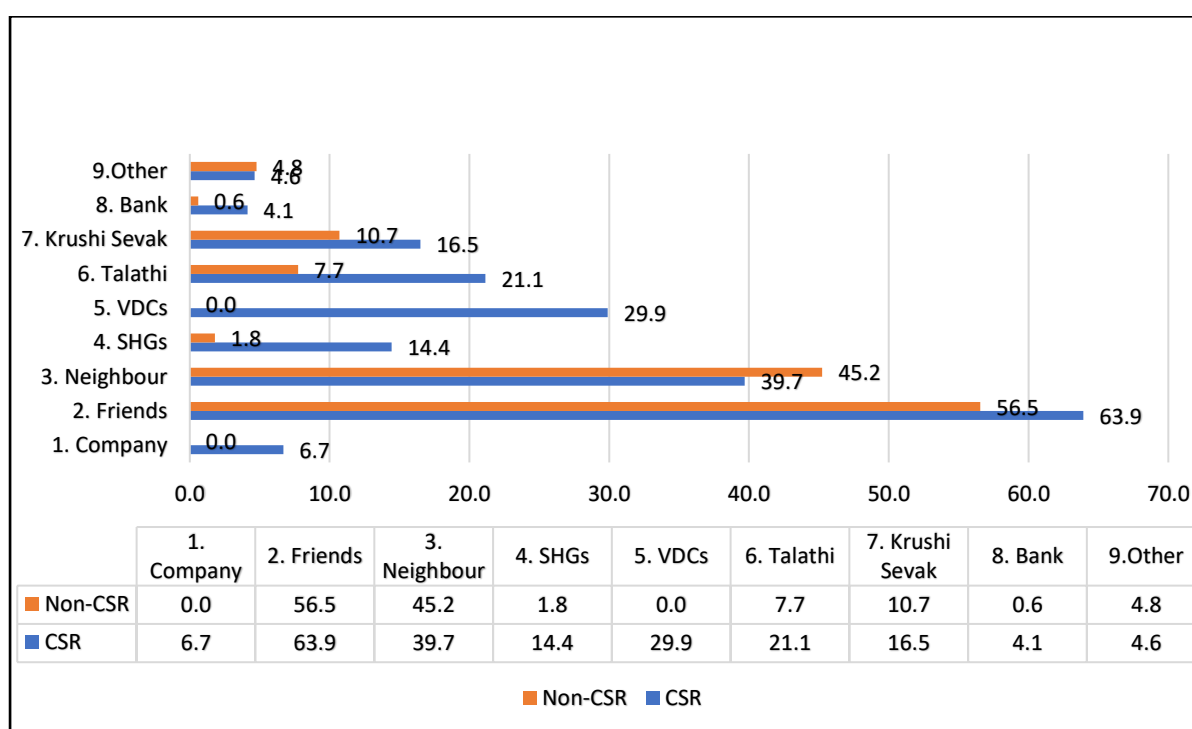
We have evaluated farmers' knowledge regarding various government schemes and the results are presented in Table 6.19. Nearly 92.1 per cent farmers in CSR villages reported knowing various government agri-related schemes, while 83.9 per cent farmers responded that they were aware of them. The level of awareness among farmers in villages with and without CSR regarding agri-related government schemes differs significantly. A chi-square test of

independence was performed to examine the relation between the types of villages and the farmers' knowledge of agri-related government schemes. The relationship between these variables was significant. This implies that there is sufficient statistical evidence to suggest that more CSR farmers are aware of agri-related government schemes than non-CSR farmers.

6.2.6.4 Source of information for agri-related government schemes

Farmers from CSR and non-CSR villages have received information about various agri-related schemes from different sources. Graph 6.1 shows that friends were the dominant source of information for the government schemes for both CSR and non-CSR farmers.

Figure 6 1: Source of Information for agri-related government schemes



Source: Author’s calculation based on the field survey (2022).

The second important source was neighbours in both types of villages. Variations exist in sources of information regarding agri-government schemes by way of companies, SHGs and VDCs. Approximately 29.9 per cent farmers received information from VDCs, 14.4 per cent from SHGs and 6.7 per cent from companies in CSR villages, while 0.0 per cent, 1.8 per cent and 0.0 per cent respectively received information in non-CSR villages. JBGVS has established SHGs and VDCs to develop villages and empower women. VDCs play a vital role in providing information on government schemes, promoting awareness of sustainable agriculture and promoting efficient use of resources. Community involvement in CSR activities has been given importance.

6.2.6.5 Access to government schemes in the last five years

Accessibility of agriculture-related government schemes is crucial for farmers. Nearly 80.4 per cent of farmers in CSR villages reported accessing various government agri-related schemes in the last five years, while 77.9 per cent farmers accessed various government agri-related schemes in non-CSR villages. The level of self-awareness among farmers in villages with and without access to government schemes through CSR differs significantly. A chi-square test of independence was performed to examine the relation between the types of villages and the farmers' knowledge of agri-related government schemes. The difference between CSR and non-CSR villages was not significant.

Table 6 20: Access to government schemes in the last five years

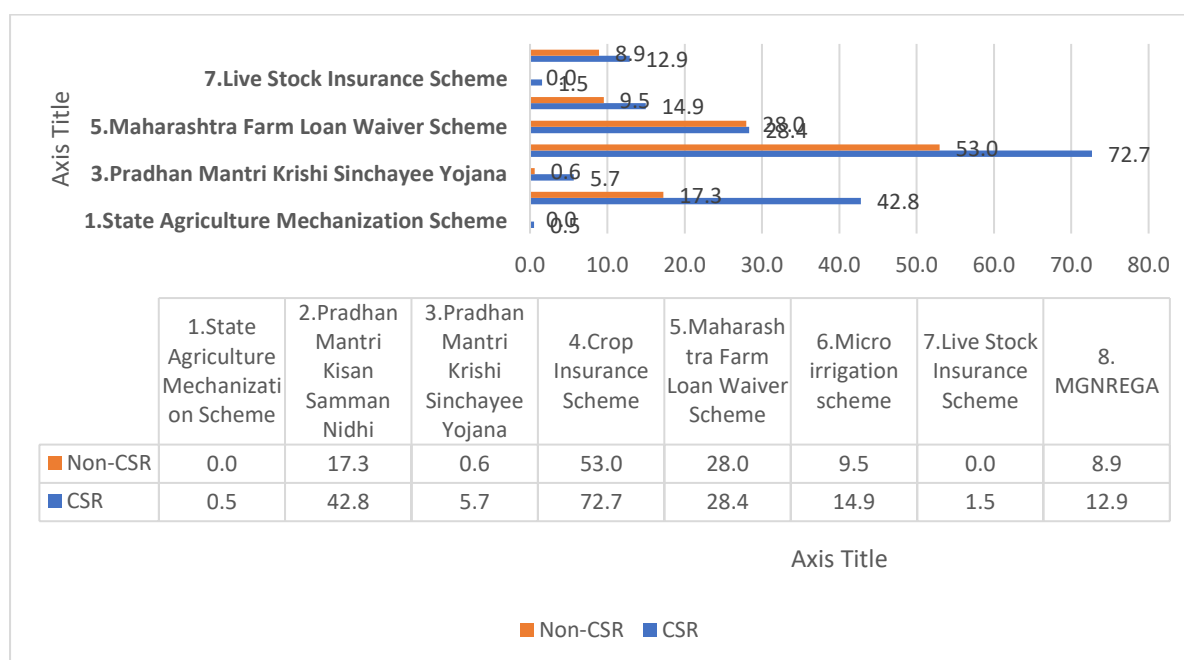
Access government schemes in the last five years	CSR		Non-CSR		Total		Statistic test	Value	Sig. (2-tailed)
	Count	Per cent	Count	Per cent	Count	Per cent			
Yes	156	80.41	126	75	282	77.90	Chi-square	1.53	0.216
No	38	19.58	42	25	80	22.09	Fisher's Exact		0.253
Total	194	100	168	100	362	100			

Source: Author's calculation based on the field survey (2022).

6.2.6.5.1 Access government schemes

It has been evaluated which government schemes farmers have accessed highly, as presented in Graph 6.2. Approximately 42.8 per cent of farmers from CSR villages and 17.3 per cent of non-CSR farmers have accessed PMKSN. The crop insurance scheme was accessed by 72.7 per cent of residents in CSR villages and 53 per cent in non-CSR villages. The MANGERA scheme has been accessed by 12.9 per cent and 8.9 per cent of CSR and non-CSR villages respectively. CSR farmers' access to micro-irrigation was higher than that of non-CSR farmers. No remarkable difference was found in other schemes accessed by farmers in both CSR and non-CSR villages. In short, CSR village farmers accessed schemes in proportion to their numbers. Awareness activities conducted by VDCS and SHGs in CSR villages have increased access to agriculture-related government services.

Figure 6 2: Access to government schemes by farmers



Source: Author’s calculation based on the field survey (2022).

6.2.7 Ecological factors

Over 750 million people worldwide are hungry, primarily due to their inability to access sufficient food.³¹ An inability to obtain sufficient food due to lack of funds or resources, or food insecurity during specific periods of the year is one of the primary reasons for inadequate food production. The rapidly expanding global population has increased demands for food and energy. According to current projections, the human population is expected to grow from 7.6 billion to 9.7 billion by 2050, necessitating a 70-100 per cent rise in the output of key cash and commodity crops. The Green Revolution introduced nitrogen fertilisers and insecticides derived from fossil fuels in the 1960s to boost yields. With higher yields, they helped to enhance agricultural output globally and also changed crop selection so that the primary criterion is the amount of nitrogen in the produced product. However, in the 1990s, yields declined internationally, particularly in poorer nations. Excess nitrogen accumulates in the soil and contaminates water systems through leaching or runoff (Angela et al., 2024). The fact that the main food crops have reached the biological limit of sustainable growth rates is another challenge facing agriculture (Angela et al., 2024).

³¹ <https://www.fao.org/newsroom/detail/122-million-more-people-pushed-into-hunger-since-2019-due-to-multiple-crises--reveals-un-report/en>

Although the Green Revolution enabled India to become self-reliant in food grain production (Abrol & Sangar, 2006), it also led to several environmental problems including decreased soil fertility, waterlogging, pollution of both surface and groundwater and increased incidence of pests and diseases. Besides, climate change has created a new concern by threatening Indian agriculture and food security (Datta et al., 2022). There are only limited arable land reserves and, therefore, increasing the land area used for agricultural production is not a practical way to boost the food supply. Poor soil quality such as inadequate organic matter, water-holding capacity, or nutrients, makes 45.7 per cent of the world's land area unusable for farming. The soil condition is a crucial component that should be considered to enhance crop production (Angela et al., 2024).

Maintaining agricultural output depends on the quantity and quality of natural resources like soil and water. Maintaining agricultural growth requires promoting the conservation and sustainable use of these finite natural resources using regionally appropriate techniques. Approximately 60 per cent of India's net sown area is still under rainfed agriculture, which accounts for 40 per cent of the food production. Therefore, expansion of rainfed agriculture and preservation of natural resources are crucial for meeting the growing food grain needs.³² To enhance agricultural productivity in rangeland areas like Marathwada we must focus on integrated farming, soil health management, water use efficiency, and synergising resource conservation. JBGVS has taken the initiative to make the agricultural sector sustainable in CSR villages.

6.2.7.1 Knowledge of use of agri-technology

Technology also plays a significant role in the agricultural sector. The type of technology used determines whether higher production or crop yield is achieved, and knowledge of agri-technology is essential for farmers. There is a rapid change in the environment and uncertainty in Indian agriculture, creating a need for agricultural technology knowledge among farmers. We have evaluated knowledge of agri-technology use and the results are presented in Table 6.21. Nearly 71.6 per cent of farmers in CSR villages reported knowing the use of agri-technology, while only 40.47 per cent of farmers in non-CSR villages. The level of knowledge about the use of agri-technology among farmers in CSR villages and non-CSR villages significantly differs.

³² NMSA, Department of Agriculture and Farmer Welfare, Ministry of Agriculture and Farmer Welfare, GOI.

Table 6 21: Knowledge of the use of agri-technology

Knowledge to use agri-technology	CSR		Non-CSR		Total		Statistic test	Value	Sig. (2-tailed)
	Count	%	Count	%	Count	%			
Yes	139	71.6	68	40.5	207	57.2	Chi-square	35.73	0.000
No	55	28.4	100	59.5	155	42.8	Fisher's Exact		0.000
Total	194	100	168	100	362	100			

Source: Author's calculation based on the field survey (2022).

The association between village types and farmers' awareness of agri-technology use was examined using a chi-square test of independence. The difference between CSR and non-CSR villages was significant. Farmers' knowledge of agri-technology use was higher in CSR villages than in non-CSR villages. Within CSR villages, their knowledge of agri-technology use varied. As many as 90.6 per cent of CSR-MI, 80.0 per cent of CSR-IP and 71.6 per cent of farmers knew about agri-technology use. Only 12.5 per cent of farmers in CSR-NIP knew about agri-technology use. Farmers in CSR-MI had more knowledge than other farmers. They use various water-saving and cultivation technologies. Farmers with higher education use more technology in the agricultural sector.

6.2.7.2 Knowledge of use of water and cultivation technology

Table 6 22: Knowledge of use of water and cultivation technology

Variables & categories	CSR		Non-CSR		Total		Statistic test	Value	Sig. (2-tailed)
	Count	%	Count	%	Count	%			
Water Use Technology									
Yes	135	69.6	64	38.1	199	55.0	Chi-square	36.0737	0.000
No	59	30.4	104	61.9	163	45.0	Fisher's Exact		0.000
Total	194	100.0	168	100.0	362	100.0			
Cultivation Technology									
Yes	104	53.6	22	13.1	126	34.8	Chi-square	65.1217	0.000
No	90	46.4	146	86.9	236	65.2	Fisher's Exact		0.000
Total	194	100	168	100	362	100			

Source: Author's calculation based on the field survey (2022).

Table 6.22 exhibits knowledge of water use and cultivation technology. Approximately 69.6 per cent of farmers in CSR villages reported knowing the use of water technology, while only 55.0 per cent of farmers in non-CSR villages. The level of knowledge about water uses and cultivation technology among farmers in CSR villages and non-CSR villages differs significantly. The difference between CSR and non-CSR villages was significant. Farmers' knowledge of water uses and cultivation technology was significantly higher in CSR villages

than in non-CSR villages. Farmers in CSR-MI were more knowledgeable about water use and cultivation technology than other farmers. They use various water-saving and cultivation technologies. Besides, farmers with higher education levels and larger land sizes use more technology in the agricultural sector.

6.2.7.2 Eco-friendly/environment-friendly farming

Eco-friendly farming is the practice of using agricultural practices that prioritise environmental preservation while maximising crop production. By utilising natural methods that support soil health and ecological equilibrium, the use of hazardous pesticides and artificial inputs is reduced or eliminated. The Ministry of Agriculture and Family Welfare reports that 69 million hectares of cultivable land were lost between FY 2015-16 and FY 2021-22. Soil degradation, climate change and unsustainable farming practices are the reasons for it. Adopting sustainable agriculture is essential to increase farm income and ensure nutrition security for current and future generations.

Table 6 23: Eco-friendly/environment-friendly farming

Steps taken to make ag. environment friendly	CSR		Non-CSR		Total		Statistic test	Value	Sig. (2-tailed)
	Count	%	Count	%	Count	%			
Yes	66	34.0	16	9.5	82	22.7	Chi-square	30.84	0.000
No	128	66.0	152	90.5	280	77.3	Fisher's Exact		0.000
Total	194	100	168	100	362	100			

Source: Author's calculation based on the field survey (2022).

We have evaluated the eco-friendly practices on the farms. Table 6.23 shows that 34.0 per cent of farmers are from CSR villages and 22.7 per cent from non-CSR villages. Acceptance of eco-friendly practices was significantly higher in CSR villages than in non-CSR villages. Even in CSR villages, only 34 per cent of farmers follow eco-friendly practices, while 66.0 per cent still do not. Lack of awareness, unwillingness of farmers and lack of promotion by the government for eco-friendly practices are the main reasons for the non-adoption of eco-friendly agricultural practices. We have investigated farmers' eco-friendly farming practices in CSR and non-CSR villages. According to the Council on Energy, Environment and Water (CEEW) Research, less than 4 per cent of Indian farmers have implemented sustainable agricultural systems and practices.³³ Table 6.24 shows that 24.7 per cent of CSR village farmers and 6.0 per cent of non-CSR village farmers have adopted eco-friendly agricultural practices.

³³ <https://economictimes.indiatimes.com/news/economy/agriculture/less-than-four-percent-indian-farmers-adopted-sustainable-agricultural-practices-says-study/articleshow/82165017.cms>

Table 6 24: Environment-friendly activities

Village type		Soil testing		Organic fertiliser		Vermicompost		Organic Pesticides		Others		Total
		No.	%	No.	%	No.	%	No.	%	No.	%	
CSR & Non-CSR	CSR	48	24.7	17	8.8	17	8.8	9	4.6	5	2.6	194
	Non-CSR	10	6.0	14	8.3	2	1.2	3	1.8	0	0.0	168
Intra CSR	Irrigated	48	28.2	17	10.0	17	10.0	9	5.3	5	2.9	170
	Non-Irrigated	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	24
Intra Irrigated	Micro Irrigation Adopter	43	33.6	16	12.5	17	13.3	9	7.0	4	3.1	128
	Non-Micro Irrigation Adopter	5	11.9	1	2.4	0	0.0	0	0.0	1	2.4	42

Source: Author's calculation based on the field survey (2022).

The adoption of eco-friendly technology in CSR villages is significantly higher than the national rate and the rate in non-CSR villages. The adoption of eco-friendly agriculture practices by CSR-MI farmers was higher than that of CSR, CSR-IP, and CSR-NMI. It found that 48 sample farmers had conducted soil testing in CSR villages and 40 farmers came to understand the importance of soil testing through JBGVS. Eight farmers came to know through VDCs. JBGVS has conducted training programmes and field visits to other villages through CSR activities. It has encouraged farmers to adopt eco-friendly practices in their agricultural land for sustainable development.

6.2.8 Determinants of agricultural growth

A multiple regression analysis was conducted to determine the factors that significantly influence the agricultural growth of the sample. Linear regression analysis was employed to determine the correlation between one or more independent variables and a single dependent variable (Alemu & Tewabe, 2020). The multiple regression econometric model was used to analyse factors affecting the growth of agriculture and other sectors on whether the dependent variables are dummy, continuous or censored at a certain level (Addisu, 2016; Demisew, 2018; Fikadu, 2015; Kagnew et al., 2018; Giribababu, 2019), Ebrahim & Andualem, 2023; Alemu & Tewabe, 2020).

This study was conducted using a multiple linear regression model (MLR) to evaluate the impact on agricultural growth. It used different dependent variables: net annual income, net annual income from agricultural activities, net annual income from agricultural allied activities, gross cropped area in ha, crop intensity, crop cultivation frequency, Herfindahl Index (at farmer level), modified entropy Index (at farmer level), Composite Entropy Index, growth in gross

cropped area from 2016-17 to 2020-2021, total production for each farmer in quintal, total per capita, production per farmer, total productivity, maximum number of external labour per crop and maximum number of total external labour days per crop. The explanatory variables considered in the analysis are village type (CSR dummy), GIA, net sown area, irrigation, micro irrigation adopter, land ownership (single land ownership dummy), type of family (joint dummy), age group (35-64 dummy), age group (65 or above) and education (graduate or above dummy).

Table 6 25: Multiple Regression Models

Model no.	Model
1	$NAI = \beta_0 + \beta_1GIA + \beta_2NSA + \beta_3LO + \beta_4TF + \beta_5Ed + \epsilon$
2	$NAIA = \beta_0 + \beta_1GIA + \beta_2NSA + \epsilon$
3	$NAIAA = \beta_0 + \beta_1VT + \beta_2NSA + \beta_3MI + \beta_4AG y + \beta_5 AG o + \epsilon$
4	$GCA = \beta_0 + \beta_1VT + \beta_2GIA + \beta_3NSA + \beta_4LO + \epsilon$
5	$CI = \beta_0 + \beta_1VT + \beta_2GIA + \beta_3NSA + \beta_4IP + \beta_5LO + \beta_6TF + \epsilon$
6	$CCF = \beta_0 + \beta_1VT + \beta_2GIA + \beta_3IP + \beta_4MI + \epsilon$
7	$HI = \beta_0 + \beta_1VT + \beta_2NSA + \beta_3IP + \beta_4MI + \epsilon$
8	$MEI = \beta_0 + \beta_1VT + \beta_2NSA + \beta_3IP + \beta_4MI + \epsilon$
9	$CEI = \beta_0 + \beta_1VT + \beta_2NSA + \beta_3IP + \beta_4MI + \epsilon$
10	$GGCA = \beta_0 + \beta_1VT + \beta_2GIA + \beta_3NSA + \beta_4MI + \beta_5TF + \epsilon$
11	$TP = \beta_0 + \beta_1GIA + \beta_2NSA + \beta_3MI + \beta_4TF + \epsilon$
12	$TPCP = \beta_0 + \beta_1GIA + \beta_2NSA + \beta_3LO + \epsilon$
13	$TPr = \beta_0 + \beta_1VT + \beta_2GIA + \beta_3MI + \beta_4TF + \epsilon$
14	$ELPC = \beta_0 + \beta_1VT + \beta_2GIA + \beta_3NSA + \beta_4MI + \epsilon$
15	$ELPD = \beta_0 + \beta_1VT + \beta_1NSA + \beta_2MI + \beta_3LO + \beta_4TF + \beta_5AGy + \beta_6AGo + \epsilon$

Where,

Dependent variable

NAI- Net annual income

NAIA-Net annual income from agricultural activities

NAIAA-Net annual income from agricultural allied activities

GCA- gross cropped area in ha

CI- crop intensity

CCF- crop cultivation frequency

HI- Herfindahl Index (at farmer level)

MEI- Modified Entropy Index (at farmer level)

CEI- Composite Entropy Index

GGCA- growth in gross cropped area from 2016-17 to 2020-21

TP-Total production for each farmer in quintal

TPCP-total per capita (as per village population) production per farmer
 TPr- total productivity in quintal per h for each farmer
 ELPC- maximum number of external labour per crop
 ELPD- maximum number of total external labour days per crop,

Explanatory variables

VT-village type (CSR dummy),
 GIA -gross irrigated area
 NSA -net sown area in h
 IP -irrigation present
 MI -micro irrigation adopter
 LO -land ownership (single land ownership dummy)
 TF-type of family (joint dummy)
 AGy -age group young (35-64 dummy)
 AGo -age group old (65 or above)
 Ed- education (graduate or above dummy).
 β_0 = intercept
 $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ = coefficients of independent variables
 ϵ = error

MLR models are presented in Table 6.25. Only significant variables are considered for every model. We systematically removed explanatory variables that were insignificant from the initial regression model. After these eliminations, the final regression model was estimated. Many multiple linear regression models are presented in the Table 6.25. The purpose of using agricultural growth-related variables was to test whether the associations with explanatory variables impact the dependent variables. To identify the key variables significantly impacting the sample, we used regression analysis. We systematically removed explanatory variables that were found to be statistically insignificant from the initial regression model.

After these eliminations, the final regression model was estimated and the results are presented in Table 6.25, which summarises the final multiple regression equation. We have applied nearly fifteen multiple regression models to understand various variables. Various variables have been assessed to see the relationship between agricultural growth and them. We selected the dependent variables that were statistically significant.

The multiple linear regression model

$$NAI = \beta_0 + \beta_1GIA + \beta_2NSA + \beta_3LO + \beta_4TF + \beta_5Ed + \epsilon \text{ -----(1)}$$

examines the relationship between the NAI of farmers and five independent variables: gross irrigated area, net sown area, single land ownership, joint family structure and education level (graduate or above). The goal is to determine how much these factors affect farmers' income and how much of a difference they make in NAI. The model explains 45 per cent of the variation in NAI ($R^2 = 0.45$). The findings indicate that all five independent variables significantly influence farmers' NAI. Gross irrigated area ($\beta_1 = 0.42$) substantially impacted NIA, indicating a strong relationship between the amount of irrigation available to farmers and

their net annual income. The next highest ranked explanatory variable was the net sown area ($\beta_2 = 0.20$), followed by the farmer's education level (graduate or above, $\beta_6 = 0.16$) and joint family ($\beta_4 = 0.08$). Single land ownership ($\beta_3 = -0.10$) was associated with a reduction in NAI for the following reasons: Reason 1. The average land holding of single land ownership is only 1.47 ha compared to the joint land ownership of 2.43 ha. Reason 2.- Most joint families are involved in joint land ownership and the majority are medium to large farmers.

Although being a graduate or having a higher level of education has a higher correlation with income level, on average it results in a significant increase in NAI when other factors are constant. Most educated farmers have adopted modern water-saving technologies in their agriculture and have multiple income sources. Therefore, education plays a vital role in NAI. In short, we can conclude that irrigation, NSA and education are positively associated with NAI (Junpeng et al., 2020; Biswajit et al., 2017; Amit & Nancharaiah, 2017; Babovic et al., 2009).

The multiple linear regression model

$$NAIA = \beta_0 + \beta_1GIA + \beta_2NSA + \epsilon \text{ -----(2)}$$

This study examines the relationship between farmers' net annual income from the agricultural sector (NAIA) and two independent variables: gross irrigated and net sown area (NSA). The objective is to determine how these factors influence farmers' NAIA. The model explains 57 per cent of the variation in NAI ($R^2 = 0.57$). The findings indicate that both independent variables significantly influence farmers' NAIA. Gross irrigated area ($\beta_1 = 0.57$) substantially impacted NAIA, indicating a strong relationship between the amount of irrigation available to farmers and their net annual income from agriculture. The next highest ranked explanatory variable was the net sown area ($\beta_2 = 0.25$). The significant association between NAIA and only two factors gross irrigated area and net sown area explains the successful impact of the intervention programme. JBGVS has worked to improve water levels (water conservation) in the villages which has helped farmers increase their gross irrigation area (GIA), contributing to an increase in net area irrigated (NAI). Of these two factors, the amount of irrigation has a stronger association, as it, in turn, affects multiple other factors that contribute to improving agricultural income. In short, we can conclude that gross irrigated area and net sown area are positively associated with NAIA (Junpeng et al., 2020; Biswajit et al., 2017; Amit & Nancharaiah, 2017; Babovic et al., 2009).

Table 6 26: Multiple Regression Model summary

Multiple Regression Model summary													
Sr. No.	Multiple regression			Standardised coefficients									
	Dependent variable Y	Unit of Measurement of Y	R square	Village Type CSR Dummy	GIA-2020-21	NSA in Ha	Irrigation Present	Micro Irrigation Adopter	Single Land Ownership Dummy	Joint Type Family Dummy	Age Group 35-64 Dummy	Age Group 65 or above	Graduate or above Dummy
	Unit of measurement of independent variables	-	-	Binary	Ha	Ha	Binary	Binary	Binary	Binary	Binary	Binary	Binary
1	NAI	Rs.	0.45		0.42	0.20			-0.10	0.08			0.16
2	NAIA	Rs.	0.57		0.57	0.25							
3	NAIAA	Rs.	0.16	0.25		0.16		0.11			-0.19	-0.17	
4	GCA in Ha	Ha	0.92	0.06	0.29	0.75			0.05				
5	CI	Percentage	0.30	0.18	0.39	-0.35	0.22		0.11	-0.10			
6	CCF	Annual count	0.53	0.30	0.20		0.30	0.19					
7	HI (at farmer level)	Unitless from 0 to 1	0.53	0.26		0.23	0.33	0.26					
8	MEI(at farmer level)	Unitless from 0 to 2	0.32	0.18		0.14	0.37	0.10					
9	CEI	Unitless from 0 to 3	0.52	0.26		0.21	0.34	0.25					
10	Growth in GCA from 2016 to 2021	Ha	0.69	0.16	0.54	0.13		0.19		0.08			
11	TP for each farmer	Quintal	0.50	0.08	0.40	0.19		0.19		0.10			
12	TPCP(As per village population)	Quintal per person	0.39		0.47	0.26			0.12				
13	TPr- for each farmer	Quintal per Ha	0.52	0.18	0.25		0.00	0.44		0.11			
14	ELPC	No. of Persons	0.18	0.13	0.17	0.15		0.13					
15	ELPD	No. of days	0.30	0.13		0.17		0.12	-0.16	0.30		-0.12	-0.13

Source: Author's calculation based on the field survey (2022).

Notes: 1. Green colour indicates a substantial impact, followed by lighter gold, red, and orange. 2. Author's calculation using PSPP software version 2021

3. Significance levels are as follows: P < 0.01, **P < 0.05, *** P < 0.10.

The multiple linear regression model

$$NAIAA = \beta_0 + \beta_1VT + \beta_2NSA + \beta_3MI + \beta_4AG_y + \beta_5 AG_o + \epsilon \text{ -----(3)}$$

examines the relationship between the net annual income from agricultural allied activities (NAIAA) of farmers and five independent variables: CSR village, net sown area, micro irrigation adopter, age group (young, 35-64), and age group (old, 65 or above). The goal is to determine how these factors impact farmers' income and the magnitude of the difference they make in NAIAA. The model explains 16 per cent of the variation in NAI ($R^2 = 0.16$). The findings indicate that all five independent variables significantly influence farmers' NAIAA. The CSR village ($\beta_1 = 0.25$) substantially impacted NAIAA, indicating a strong relationship between the CSR village and its NAIAA. The next highest ranked explanatory variables were the net sown area ($\beta_2 = 0.16$) and micro irrigation adopter ($\beta_3 = 0.11$). The association between NAIAA and age group young (35-64), and age group old (65 or above) was negatively associated. ($\beta_4 = - 0.19$ and $\beta_5 = - 0.17$). Respondents in the 15-35 age group were more actively involved in dairy and goat farming compared with other age groups. JBGVS had trained youth in the CSR village in various agri-allied activities, encouraging young people between 15 and 35 to actively engage in the agri-allied sector. Before CSR activity, the dairy sector was very paltry and only 300- 350 litres of milk collection was done in CSR villages in 2016-17. More than 6,500 liters of milk were collected in CSR villages in 2020-21.

Income from agricultural allied activities was more closely associated with whether the farmer was from a CSR village. Before the implementation of CSR activities, water scarcity had a significant impact on the dairy sector. Usable, drinking and irrigation water were available after the CSR activity. This results in an increase in the number of livestock, especially hybrid cows. Dairy farming is a crucial agri-allied sector that provides sustainable income to farmers. The average number of livestock was 3.9 per household in CSR villages and 2 per household in non-CSR villages. Nearly 77.8 per cent of the sample farmers' households in CSR villages have livestock, compared with only 57.7 per cent in non-CSR villages. Of the total livestock, 42.00 per cent are cross-bred cows in CSR villages which helped the farmers get more income from the agri-allied sector. Average livestock counts were higher for those who adopted micro-irrigation methods, possibly due to better water utilisation and proportioning between agricultural and animal husbandry. In short, CSR villages, net sown areas, and micro-irrigation adopters are positively associated with NAIAA. (Junpeng et al., 2020; Biswajit et al., 2017; Amit & Nancharaiyah, 2017; Babovic et al., 2009).

The multiple linear regression model

$$GCA = \beta_0 + \beta_1 VT + \beta_2 GIA + \beta_3 NSA + \beta_4 LO + \epsilon \text{ -----(4)}$$

examines the relationship between farmers' Gross Cropped Area (GCA, in ha) and four independent variables: CSR village, gross irrigated area, net sown area and single land ownership. The goal is to determine how these factors affect gross cropped area and the magnitude of the difference they make in GCA. The model explains 92 per cent of the variation in GCA ($R^2 = 0.92$). The findings indicate that all four independent variables significantly influence GCA. NSA ($\beta_3 = 0.75$) substantially impacted gross crop area indicating a strong relationship between the net sown area and gross crop area. The next highest ranked explanatory variable was the net sown area ($\beta_2 = 0.29$), followed by CSR village ($\beta_1 = 0.06$) and single land ownership ($\beta_4 = 0.05$) which were positively associated with GCA. It is a function of land size, crop cultivation frequency and crop diversity which are directly affected by the extent of irrigation supply available. Hence, its strongest association was land size followed by gross irrigated area. Being from a CSR village and having single land ownership had a positive but weak association with GCA. In short, CSR village, gross irrigated area, net sown area and single land ownership are positively associated with GCA. Irrigation and GCA have a strong relationship. Studies by Bhalla and Singh (1997) and the World Bank (2006) confirm that irrigation enables double and triple cropping, especially in semi-arid regions. Similarly, countries like Egypt and Pakistan have expanded GCA through intensive irrigation systems. However, the relationship is not always strong. Despite irrigation facilities, GCA remains low in some areas due to poor irrigation management, groundwater depletion and poor rainfall. Shah (2009) highlighted how the over-extraction of groundwater in Gujarat has reduced cropping intensity. Climate change and erratic rainfall also affect irrigation reliability, limiting its impact on GCA. The effectiveness of irrigation depends on multiple factors such as water management, micro irrigation and the type of crop they cultivate.

The multiple linear regression model

$$CI = \beta_0 + \beta_1 VT + \beta_2 GIA + \beta_3 NSA + \beta_4 IP + \beta_5 LO + \beta_6 TF + \epsilon \text{ -----(5)}$$

examines the relationship between farmers' crop intensity (CI) and five independent variables: CSR village, gross irrigated area, net sown area, irrigation present, single land ownership and joint family. The objective is to determine the degree to which these variables impact crop intensity. The model explains 30 per cent the variation in CI ($R^2 = 0.30$). The findings indicate that all six independent variables significantly influence CI. The impact of four independent

variables on CI was positive, while two variables had a negative impact. Gross irrigated area ($\beta_2 = 0.39$) substantially impacted crop intensity indicating a strong relationship between gross irrigated area and crop intensity. The next highest ranked explanatory variable was the presence of irrigation ($\beta_4 = 0.29$) followed by CSR village ($\beta_1 = 0.18$) and single land ownership ($\beta_5 = 0.11$), all of which were positively associated with CI. The association between CI and net sown area and the joint family group was negatively correlated. ($\beta_3 = -0.35$ and $\beta_6 = -0.10$). Crop intensity gives a measure of the extent of reusability of the land within a year.

Consequently, the strongest positive association was observed with gross irrigated area (which directly influenced GCA) and the strongest negative association was observed with land size. Irrigation, single land ownership and being in a CSR village also positively impacted crop intensity, while being in a joint family was negatively associated with increased crop intensity. Over the past few decades, the primary drivers of cropping intensity in India have been the development of more extensive and superior irrigation systems, improved varieties and increased fertiliser use (Vaidyanathan, A., 1994). Dhawan, B. (1991) examined variations in irrigation and agricultural intensity across India. Mondal, T. and Sarkar, S. (2021) revealed a low positive correlation between cropping and irrigation intensity in the district. This indicates that cropping intensity was also influenced by other factors such as fertilizers, technological inputs and HYV seeds of cereals.

The multiple linear regression model

$$CCF = \beta_0 + \beta_1 VT + \beta_2 GIA + \beta_3 IP + \beta_4 MI + \epsilon \text{ -----(6)}$$

This study examines the relationship between farmers' crop cultivation frequency (CCF) and four explanatory variables: CSR village, gross irrigated area, irrigation presence and micro-irrigation adopter. The objective is to determine how these factors affect gross cropped area and the magnitude of the difference they make in CCF. The model explains 53 per cent of the variation in CCF ($R^2 = 0.53$). The findings indicate that all four independent variables have a significant impact on CCF. CSR village ($\beta_1 = 0.30$) and irrigation presence ($\beta_3 = 0.30$) had a substantial impact on CCF, indicating a strong relationship between CSR village, irrigation presence and crop cultivation frequency (CCF). The next highest ranked explanatory variable was the gross irrigated area ($\beta_2 = 0.20$) followed by micro-irrigation ($\beta_4 = 0.11$) which were positively associated with CCF. Nearly 80 per cent farmers used to cultivate one-time crop, and 20 per cent cultivated two-time crops in 2016-17. In contrast, 16 per cent farmers grew

one-time crop, 81 per cent grew two-time crops and 3 per cent grew three-time crops in 2020-21. Irrigation is a vital factor in increasing crop cultivation frequency.

The multiple linear regression model

$$HI = \beta_0 + \beta_1VT + \beta_2NSA + \beta_3IP + \beta_4MI + \epsilon \text{ -----(7)}$$

This study examines the relationship between the crop diversity index (measured by the Herfindahl Index HI) at the farmer level and four explanatory variables: CSR village, net sown area, irrigation presence and micro-irrigation adoption. The objective is to determine the extent to which these factors affect crop diversification and the magnitude of the difference they make in HI. The model explains 53 per cent the variation in CCF ($R^2 = 0.53$). The findings indicate that all four independent variables significantly impact HI. Irrigation presence ($\beta_3 = 0.33$) impacted HI indicating a strong relationship between irrigation presence and crop diversity. The next highest ranked independent variables were CSR village ($\beta_1 = 0.26$) and micro-irrigation ($\beta_4 = 0.26$) followed by net swan area ($\beta_2 = 0.23$), all of which were positively associated with HI. We have considered the transformed Herfindahl Index (1-HI) at the farmer level and the sum of squared proportions. Herfindahl Index is a measure of crop diversity. It is calculated by adding the squares of each crop's acreage share of the entire cropped area. As the number of crops increases, it approaches zero. To enable comparisons with other variables in the positive direction, it is transformed by subtracting 1(1-HI). Hence, the transformed Herfindahl Index ranges from 0, showing no diversity, to 1, indicating perfect diversity regarding the number of crop types sown on a farm. Similar results reported by Monka et al. (2017) show that irrigation facilities and crop diversification are positively associated (Kumar & Gupta, 2015; De & Chhattopadhyay, 2010; Lighton,2015) and access to irrigation and crop diversification are also positively associated.

The multiple linear regression model

$$MEI = \beta_0 + \beta_1VT + \beta_2NSA + \beta_3IP + \beta_4MI + \epsilon \text{ -----(8)}$$

This study examines the relationship between crop diversity (measured by the MEI at the farmer level) and four explanatory variables: CSR village, net sown area, irrigation presence and micro-irrigation adoption. The objective is to determine how these factors affect crop diversification and the magnitude of the difference they make in MEI. The model explains 32 per cent of the variation in MEI ($R^2 = 0.32$). The findings indicate that all four independent variables have a significant impact on MEI. Irrigation presence ($\beta_3 = 0.37$) impacted MEI

indicating a strong relationship between irrigation and crop diversity. The next highest ranked independent variables were CSR village ($\beta_1 = 0.26$) followed by net sown area ($\beta_2 = 0.14$) and micro-irrigation ($\beta_4 = 0.10$), all of which were positively associated with MEI. It is regarded as an inverse measure of concentration exhibiting a logarithmic character. It uses a variable logarithm base. It measures the deviations from equal distribution of cropped area proportions. However, it does not incorporate the number of crops. As the proportions of areas for each crop become more uniform, the index approaches a value of 1.

The multiple linear regression model

$$CEI = \beta_0 + \beta_1 VT + \beta_2 NSA + \beta_3 IP + \beta_4 MI + \epsilon \text{ -----(9)}$$

examines the relationship between crop diversity (measured by the CEI- Composite Entropy Index) and four explanatory variables: CSR village, net sown area, irrigation presence and micro-irrigation adoption. The objective is to determine how these factors affect crop diversification and the magnitude of the difference they make in CEI. The model explains 52 per cent variation in CEI ($R^2 = 0.53$). The findings indicate that all four independent variables significantly impact MEI. Irrigation presence ($\beta_3 = 0.34$) had a substantial impact on CEI, indicating a strong relationship between irrigation presence and crop diversity. The next highest-ranked independent variables were CSR village ($\beta_1 = 0.26$) followed by micro-irrigation ($\beta_4 = 0.25$) and net sown area ($\beta_2 = 0.21$), all of which were positively associated with CEI.

All of the Modified Entropy Index's advantageous characteristics are included in the CEI. Because it assigns appropriate weight to the quantity of activities in our example, the variety of crops it is used to assess diversity across scenarios with varying and substantial amounts of activities. As concentration declines and the quantity of crops or activities grows, the CEI's value rises. Since zero and one are the boundaries of both index components, the CEI value falls between the zero and one. Since the index uses $\log P$ with base N as weights, it assigns more weight to lower quantities and less to higher quantities. Multiple factors influence crop diversification. Along with good irrigation, household income, number of household members with secondary education, gender of the head of household, number of livestock units, access to irrigation, membership to a farmers' group, access to markets, agro-ecological zone and farming experience positively and significantly influence crop diversification (Dube L., 2016). The impact of gross irrigated area (GIA) was not statistically significant on the Simpson Index of Crop Diversification (SID). A state with irrigation infrastructure tends to

have more cash crops grown by farmers than traditional crops like rice and wheat. Annual rainfall and cropping intensity significantly impact the SID (Sanjive K. & Sakshi G., 2015).

The multiple linear regression model

$$GGCA = \beta_0 + \beta_1 VT + \beta_2 GIA + \beta_3 NSA + \beta_4 MI + \beta_5 TF + \epsilon \text{ -----(10)}$$

examines the relationship between growth in gross cropped area (2016-17 to 2020-21) and five explanatory variables: CSR village, gross irrigated area, net sown area, micro-irrigation adoption and joint family. The objective was to determine how these factors affect crop diversification and the magnitude of the difference they make in GGCA. The model explains 69 per cent of the variation in GGCA. ($R^2 = 0.69$). The findings indicate that all four independent variables have a significant impact on GGCA. Gross irrigated area ($\beta_2 = 0.54$) substantially impacted GGCA indicating a strong relationship between gross irrigated area and GGCA. The next highest ranked independent variables were micro-irrigation ($\beta_4 = 0.19$), followed by CSR village ($\beta_1 = 0.16$), net swan area ($\beta_3 = 0.13$) and joint family ($\beta_5 = 0.08$), all of which were positively associated with GGCA. The growth in gross cropped areas throughout the CSR intervention measures the rate of increase in agricultural activities. It was strongly associated with gross irrigation area. Positive and significant associations were found with the CSR intervention, land size, adoption of micro-irrigation and joint family structure.

The multiple linear regression model

$$TP = \beta_0 + \beta_1 VT + \beta_2 GIA + \beta_3 NSA + \beta_4 MI + \beta_5 TF + \epsilon \text{ -----(11)}$$

Examines the relationship between total production (TP) for each farmer in quintal and five explanatory variables: CSR village, gross irrigated area, net sown area, micro-irrigation adoption and joint family. The objective was to determine how these factors affect crop total production and magnitude of the difference they make in the total production of farmers. The model explains 50 per cent of the variation in TP. The findings indicate that all four independent variables have a significant impact on TP. Gross irrigated area ($\beta_2 = 0.40$) impacted TP indicating a strong relationship between gross irrigated area and TP. The next highest ranked independent variables were net swan area ($\beta_3 = 0.19$) and micro-irrigation ($\beta_4 = 0.19$) followed by joint family ($\beta_5 = 0.10$) and CSR village ($\beta_1 = 0.08$), all of which were positively associated with total production. The strongest association with production was found in gross irrigated area followed by land size and adopting micro-irrigation practices. Due to the increase in GIA, the adoption of micro irrigation facilities, a greater focus on the

production of tomatoes, onions and ginger, and improvements in crop intensity, total output per family has increased. Joint families were associated with an increase in total production.

The multiple linear regression model

$$TPCP = \beta_0 + \beta_1GIA + \beta_2NSA + \beta_3LO + \epsilon \text{ -----(12)}$$

this study examines the relationship between total per-capita production (TPCP, as per village population) and three explanatory variables: gross irrigated area, net sown area and single land ownership. The objective is to determine how these factors affect TPCP and the magnitude of their difference. The model explains 39 per cent of the variation in TP. ($R^2 = 0.39$). The findings indicate that all four independent variables have an impact on TP. Gross irrigated area ($\beta_1 = 0.47$) impacted TPCP indicating a strong relationship between gross irrigated area and TPCP. The next highest ranked independent variables were net swan area ($\beta_2 = 0.36$) and single land ownership ($\beta_3 = 0.10$), both of which were positively associated with total per-capita production. Per-capita production is an inverse function of the village population. The more populated a village, the lower the per-capita production for each farmer. Total per-capita production was associated with gross irrigated area, land size and single land ownership. The strongest association with production was found between them.

The multiple linear regression model

$$TPr = \beta_0 + \beta_1VT + \beta_2GIA + \beta_3MI + \beta_4TF + \epsilon \text{ -----(13)}$$

examines the relationship between total productivity (TPr, in kg/ha per farmer) and four explanatory variables: CSR village, gross irrigated area, presence of micro-irrigation and joint family. The objective was to determine how these factors affect TPr and the magnitude of the difference they make in it. The model explains 52 per cent of the variation in it. ($R^2 = 0.52$). The findings indicate that all four independent variables have a significant impact on it. Micro irrigation ($\beta_3 = 0.44$) had an impact on it, indicating a strong relationship between micro-irrigation and it. The next highest ranked independent variables were gross irrigated area ($\beta_2 = 0.25$) and CSR village ($\beta_1 = 0.18$), both of which were positively associated with TPr, followed by joint family ($\beta_4 = 0.11$). Productivity is a measure of production per unit of land area utilised. It was most strongly associated with adopting micro-irrigation practices followed by the gross irrigated area. Micro-irrigation adopters cultivated high-yield crops such as tomatoes, ginger and onions. Joint-type families have more land, multiple irrigation sources and knowledge about production technology. Therefore, productivity per hectare is high.

The multiple linear regression model

$$ELPC = \beta_0 + \beta_1 VT + \beta_2 GIA + \beta_3 NSA + \beta_4 MI + \epsilon \text{ -----(14)}$$

examines the relationship between the maximum number of external labours per crop and four explanatory variables: CSR village, gross irrigated area, net sown area and presence of micro-irrigation. The objective was to determine how these factors affect ELPC and the magnitude of the difference they make in ELPC. The model explains 18 per cent of the variation in ELPC ($R^2 = 0.18$). The findings indicate that all four independent variables have a significant impact on ELPC. The gross irrigated area ($\beta_1 = 0.17$) impacted ELPC indicating a strong relationship between micro-irrigation and TPr. The next highest ranked independent variables were net sown area ($\beta_3 = 0.15$), CSR village ($\beta_1 = 0.13$) and micro-irrigation. ($\beta_4 = 0.13$). Before CSR activity, the maximum of three or four months of employment availability was in the villages and farmers used to cultivate one-time crop due to water scarcity. Only some labourers secured employment in agriculture and agriculture-related activities. Therefore, small and marginal farmers and labourers from the villages often went to Chhatrapati Sambhajnagar MIDC for employment, and outward seasonal migration was high. There was little water avail, less active agriculture, less active allied sector, little job opportunity, seasonal migration and less NAI. Now people secure 10 to 11-month jobs in the village, some labourers are being brought in from Madhya Pradesh, nearby villages and other districts in Maharashtra. Seasonal inward migration is found in CSR villages. More labour is required to produce tomatoes, onions and vegetables.

The multiple linear regression model

$$ELPD = \beta_0 + \beta_1 VT + \beta_2 NSA + \beta_3 MI + \beta_4 LO + \beta_5 TF + \beta_6 AGy + \beta_7 AGo + \epsilon \text{ -----(15)}$$

examines the relationship between the maximum number of total external labour days per crop (ELPD) and seven explanatory variables. The objective was to determine how these factors affect ELPD and the magnitude of the difference they make in it. The model explains 30 per cent of the variation in it ($R^2 = 0.30$). The findings indicate that four independent variables significantly impact it and three indicators negatively impact it. Joint family type ($\beta_1 = 0.30$) impacted ELPD which indicates a strong relationship between joint family type and it. The following highest-ranked independent variables were net sown area ($\beta_2 = 0.17$) followed by micro irrigation adopter ($\beta_3 = 0.13$) and CSR village ($\beta_3 = 0.13$).

The number of days for which external labour was employed for agricultural activities gives a measure of employability within the village. This variable had the strongest association

with joint family structure. Joint families reported a higher average GCA (2.58 compared with 1.99 of nuclear families). In CSR villages this ratio was 2.98: 2.11 indicating greater scope for labour employment. It had a negative relationship with single land ownership, older age and higher education level of the farmer. Single land Ownership: maximum single land ownership for farmers is micro and small land holders Their employment has increased in agriculture. Their employment was disguised before CSR activity. Therefore, after an increase in GIA in 2020-21, employment (for out-of-family members) could not increase. Age Group 65 or above 28 respondents (out of 194 in CSR) are 65 or above. Of this, 54 per cent of farmers belong to a joint family, and 75 per cent are micro and small landholders. Joshi et al. (2008) emphasised that watershed development programmes, which include soil and water conservation, have created significant employment through labour-intensive activities such as contour bunding, trenching and afforestation. Singh et al. (2017) reported that irrigation increased farm employment by 24 days in Bharuch district, and 38 and 37 days for males and females respectively in Narmada district. Similarly, Pooja (2020) found that irrigation water deficits significantly affected annual household employment, especially in the middle-reach areas of the Tungabhadra basin.

6.3 Summary

The study provides insight into the factors determining agricultural growth and women's empowerment in the villages of Chhatrapati Sambhajnagar district. It has carried out a primary survey of farmers and women's households in the district villages. Selected villages revealed that overall agricultural growth has been dominated by irrigation, micro irrigation and education, which was similar to the study by Junpeng et al. (2020), Biswajit et al. (2017), Amit & Nancharaiah (2017), Babovic et al. (2009), and Bhalla & Singh (1997). The study finds that household characteristics such as household education, gender, family type, irrigation facility, micro irrigation and land size are independent factors that determine agricultural growth. It has analysed variables of agricultural growth: irrigation, and soil and water management (CSR activities). Variables such as crop intensity, crop diversity, income of farmers, employment, use of eco-friendly technology, awareness and access to government schemes, production and productivity were found statistically significant. However, the study's findings significantly contribute to the previous literature and show a positive association between agricultural growth, irrigation, and soil and water management. It highlights that water management plays an important role in the growth of agriculture.

Chapter-7

Impact of CSR on Women's Empowerment

7.1 Introduction

The women's empowerment index results, socioeconomic factors that affect women's empowerment and socioeconomic characteristics of the sample homes are presented. A multiple regression model was employed to assess the influence of various factors on women's empowerment.

7.2 Socio-economic profile of sample households

Economic, political, social, educational and personal factors play a role in women's empowerment. The level of empowerment varies by individual characteristics such as age, education, occupation, marital status and the number of children in the respondents' households.

7.2.1 Characteristics of respondents

Table 6.1 presents the percentage distribution of CSR, non-CSR, direct beneficiaries and non-beneficiaries by age, marital status, type of family, religion, category and education. There are 80 households from CSR villages and another 80 from non-CSR villages. CSR households are further divided between direct beneficiaries (38 families) and non-beneficiaries (42 households). The age distribution of the sample of women's households is presented in Table 7.1. It is observed that 51.3 per cent of respondents belonged to the 35-64 age group in CSR villages and 61.25 per cent to non-CSR villages. In the age group 25 -34, 40 per cent in CSR villages and 27.5 per cent in non-CSR villages were like this. The average age of CSR households was 38.65 and 38.66 years for non-CSR households.

The marital status of the informants is categorised into four groups in Table 7.1. Nearly 93.8 per cent of the respondents were married in the total sample. The same pattern was found in CSR and non-CSR villages. The categories of households that are divorced and widowed are small (1.9% and 4.4% respectively). Divorced and widowed households comprise 1.3 per cent and 6.3 per cent of non-CSR households, respectively. Married families comprise a majority of the population. The CSR programmes cover a wide range of marital situations, such as divorce and bereavement. Yet, a majority of direct participants are married and they are rarely from other matrimonial groups.

Table 7 1: Socio-economic profile of sample households

Household Profile Variables	CSR & Non-CSR						Intra-CSR					
	CSR		Non-CSR		Total		Direct beneficiaries		Non-beneficiaries		Total	
	No	%	No	%	No.	%	No.	%	No.	%	No.	%
Age (Years)												
15-24	3	3.8	6	7.5	9	5.6	3	7.9	0	0	3	3.8
25-34	32	40	22	27.5	54	33.8	15	39.5	17	40.5	32	40
35-64	41	51.3	49	61.25	90	56.3	19	50	22	52.4	41	51.3
65 and above	4	5	3	3.75	7	4.4	1	2.6	3	7.1	4	5
Total	80	100	80	100	160	100	38	100	42	100	80	100
Marital status												
Married	76	95	74	92.5	150	93.8	36	94.7	40	95.2	76	95
Single	0	0	0	0	0	0	0	0	0	0	0	0
Divorced	2	2.5	1	1.25	3	1.9	2	5.3	0	0	2	2.5
Widowed	2	2.5	5	6.25	7	4.4	0	0	2	4.8	2	2.5
Total	80	100	80	100	160	100	38	100	42	100	80	100
Type of family												
Joint family	35	43.75	35	43.75	70	43.8	16	42.1	19	45.2	35	43.8
Nuclear family	45	56.25	45	56.25	90	56.3	22	57.9	23	54.8	45	56.3
Total	80	100	80	100	160	100	38	100	42	100	80	100
Religion												
Hindu	79	98.75	67	83.75	146	91.3	37	97.4	42	100	79	98.8
Buddhist	0	0	3	3.75	3	1.9	0	0	0	0	0	0
Muslim	1	1.25	10	12.5	11	6.9	1	2.6	0	0	1	1.3
Total	80	100	80	100	160	100	38	100	42	100	80	100
Category												
General	29	36.25	34	42.5	63	39.4	17	44.7	12	28.6	29	36.3
SC	11	13.75	4	5	15	9.4	3	7.9	8	19	11	13.8
ST	4	5	5	6.25	9	5.6	0	0	4	9.5	4	5
OBC	27	33.75	32	40	59	36.9	11	28.9	16	38.1	27	33.8
NT	9	11.25	5	6.25	14	8.8	7	18.4	2	4.8	9	11.3
Total	80	100	80	100	160	100	38	100	42	100	80	100
Education												
No schooling	16	20	18	22.5	34	21.3	9	23.7	7	16.7	16	20
Upper primary	25	31.25	25	31.25	50	31.3	12	31.6	13	31	25	31.3
Secondary	23	28.75	23	28.75	46	28.8	10	26.3	13	31	23	28.8
Higher secondary	10	12.5	9	11.25	19	11.9	5	13.2	5	11.9	10	12.5
Graduation & above	6	7.5	5	6.25	11	6.9	2	5.3	4	9.5	6	7.5
Total	80	100	80	100	160	100	38	100	42	100	80	100

Source: Authors' calculation based on the field survey (2022).

These developments can help businesses in CSR initiatives to guarantee more inclusivity, particularly for marginalised groups like divorcees and widows who might not

otherwise have direct support systems. Further, the type of family status shows that 90 households (56.3%) belong to a nuclear family, followed by 70 households (43.8%) living in a joint family. The mean household size is five persons per household with no difference between non-CSR and CSR households. The religious status of households shows that about 91.3 per cent are Hindus, 6.9 per cent and 1.9 per cent Buddhists. Hindu population was the highest (98.8%) in CSR villages, while the Muslim population was more prevalent in non-CSR villages. The caste status of households shows that about 39.4 per cent belonged to the general category, 36.9 per cent to OBCs, 9.4 per cent belonged to SCs and 8.8 per cent NTs. The remaining 5.6 per cent were STs. CSR households accounted for 36.6 per cent and belonged to the general category, while non-members accounted for 42.5 per cent.

Literacy and educational attainment are significant determinants that support women's empowerment. Table 6.1 shows that 21.3 per cent respondents are illiterate, 31.3 per cent have completed upper primary education and 28.8 per cent have secondary education. As many as 11.9 per cent respondents have completed higher secondary education and only 6.9 per cent have finished graduation.

7.3 Women's empowerment

We have attempted to evaluate the impact of CSR activities on women's empowerment through various variables. The World Bank and NHFS employ multiple dimensions to assess women's empowerment. They have used economic, social, political, educational and health indicators to identify the women's empowerment index. We have only considered the economic, social and political dimensions of women's empowerment. JBGVS has worked on women's empowerment in CSR villages. It has focused on the above-mentioned three dimensions in the CSR activities in CSR villages. Therefore, this study focuses on only three dimensions of women's empowerment.

7.3.1 Impact of CSR on women's empowerment

We have assessed the effects of CSR based on a comparative study between households in CSR and non-CSR villages. Additionally, we have analysed the difference in CSR impact between direct beneficiaries (those who received direct financial support from JBGVS) and non-beneficiaries. (Households that belong to CSR villages but have not received direct financial support from JBGVS). To measure the impact of CSR activities on women's empowerment, we have developed the Women's Empowerment Index.

7.3.2 Women Empowerment Index

We have developed a multi-dimensional index for measuring women's empowerment, especially in rural context. The scoring system we describe here is comparable to common techniques for calculating the WEAI and its variations of index. (Alkire et.al, 2013). A new survey-based indicator called the Women's Empowerment in Agriculture indicator (WEAI) was developed to measure women's participation, agency, and empowerment in the agricultural sector. The WEAI was first created to represent women's empowerment, which may have been the outcome of the Feed the Future Initiative, a project funded by the US government. To evaluate the level of gender parity and empowerment in agriculture, identify key areas where empowerment needs to be strengthened, and monitor progression over time, the WEAI or its adaptations can also be applied more broadly. Using questions that can be asked in individual or household surveys, the WEAI develops indicators of empowerment and agency based on recent research (e.g., Narayan, 2005; Narayan & Petesch, 2007; Alsop et al., 2006; Ibrahim & Alkire, 2007). These indicators suggest domain-specific measures of empowerment. Men and women in the same household were interviewed to gather individual-level data, which served as the basis for the WEAI, an aggregate index. Based on the Alkire-Foster approach, it is reported at the regional or national level.

Women's empowerment index uses three dimensions (economic, political and social) of women's empowerment. We have used only three key dimensions because JBGS has worked more on these dimensions. It is based on data collected from specific women in families where they earn their living. Each dimension was given an equal weight of 10/30 after the WEAI, and the corresponding indications within each dimension were likewise given an equal weight. The indicator weight for each dimension is calculated by dividing its weight by the total number of indications in that dimension. Each indicator is composed of several questions presented to the interviewed women (Table 7.2). The indicator weight for each dimension is calculated by dividing its weight by the total number of indications in that dimension. The ladies who were questioned were given a series of questions that make up each indication (Table 7.2).

Table 7 2: Women Empowerment Index (Score if satisfied)

Empowerment Domain	Sub-domain	Criteria	Score	Domain Score	Domain Weight	Domain scoring
Economic participation and opportunity	Asset ownership	Sole or joint ownership of a house	1	17	10	0.5882
		Sole or joint ownership of land	1			
		Sole or joint property decision	1			
	Banking practice	Bank account opened during an intervention	1			
		Minimum balance maintained	1			
		Awareness of net banking	1			
		Borrowing independence	1			
		Preference for institutional loan	0.5			
		Separate savings	1			
		Savings in the bank	0.25			
		Investment in insurance	0.25			
		Financial decision power	Sole or joint control over borrowed funds			
	Sole or joint control of savings		1			
	Sole or joint decision on expenses		1			
	Earning power of female family members		1			
	Mobile phone	Ownership of a smartphone	1			
	Use of resources	Loaned funds utilized for agricultural or business activities	1			
Recent increase in savings		0.5				
Increased savings due to increased agricultural or dairy productivity		0.25				
Significant increase in savings		0.25				
Livelihood source as dairy		1				
Political empowerment	Leadership at all levels of decision-making	Awareness about the local operations of political parties	1	4	10	2.5
		Participation in discussions involving women's issues	1			
		Interaction with governance - whether interacting with government officials and representatives	1			
		Leadership position - whether head of any group or committee	1			
Social mobility, recognition and participation	Development of a network	SHG membership	1	11	10	0.9090
		Regular attendance at SHG meetings	1			
		Attendance at the gram sabha	1			
	Freedom of mobility	Independent use of public transport	1			
		Independent use of private transport	1			
	Social identification and social recognition	Perceived improvement of social status within the community	1			
		Perceived improvement of social status within the family	1			
		Perceived improvement of financial credibility	1			
	Social interaction and participation	Attendance at community events/activities	1			
		Participation in community events/activities	1			
Interaction with local political leaders		1				
Total			32	32	30	

Source: Authors' Calculation based on WEAI (Alkire et.al 2013).

There is no weighting at the question level because the process outlined below is used to determine the indicator values. To compute the WEI (Women's Empowerment Index), an individual is evaluated at the question and indicator levels. An individual's response is evaluated at the question level to see whether or not she has attained a minimal degree of empowerment for that particular subject. This minimal level is attained for all decision-related questions if the person made the choice himself or had at least some influence over it.

If a person answers a question with a score of at least one, it is classified as 1, and if not, it is coded as 0. To determine the number of questions in which a person has met minimal levels, the indicator level adds up the related question variables (coded 0 otherwise and 1 for achievement). If a specific number of questions have attained minimal accomplishment levels, it is considered that an indication has been sufficiently satisfied. The value assigned in this instance is 1; otherwise, it is 0. According to Alkire et al. (2013), the WEAI technique makes an arbitrary choice about the number of questions that should be included in each indicator. It is considered that obtaining about one-third of the available questions is a suitable threshold value for indicator adequacy to provide some consistency (see below). This assumption differs from the WEAI, which states that an indicator is considered acceptable if only one question is answered (regardless of the number of questions in the indicator). Both approaches are used to produce preliminary findings that show the impact of this variance. After that, the indicator values are added together and weighted using the previously mentioned weights. The WEI score results from this summing, and it goes from 0 for the least empowered to 1 for the most empowered women in villages. Computation of the WE is inspired by the basic approach used by Alkire et al. (2013) and Women's Empowerment in Livestock Index (A. Galiè et al., 2018) and is computed as:

$$WE_i = w_1I_{1i} + w_2I_{2i} + \dots + w_dI_{di} \dots \dots \dots (1)$$

Where WE_i is the WE score for individual i , I_{di} is coded 1 if a person i has adequacy in indicator d or 0 otherwise, and w_d is the weight assigned to indicator d . All 32 indicator weights sum to 1.

7.3.3 An assessment of the impact of CSR on women's empowerment

Table 7.3 analyses the impact of CSR on women's empowerment. The mean level of economic empowerment in CSR villages was 5.86, while in non-CSR villages, it was 4.54. A t-test was performed to examine the relationship between the type of village and economic empowerment. The relation between these variables was significant. This implies enough

statistical evidence regarding economic empowerment to prove the difference between CSR and non-CSR farmers.

Table 7 3: Women's Empowerment

Women's empowerment index	CSR		Non-CSR		t-value	p-value	Beneficiary		Non-beneficiary		t-value	p-value
	M	SD	M	SD			M	SD	M	SD		
Economic participation and opportunity	5.86	1.69	4.54	1.59	5.07	0	6.41	1.52	5.36	1.69	2.91	0.005
	(Equal variances assumed)											
Political empowerment	3.84	3.64	2.25	2.97	3.03	0.003	4.21	3.49	3.51	3.79	0.85	0.395
	(Unequal variances assumed)											
Social mobility, recognition and participation	6.27	2.3	4.47	2	5.3	0	7.01	1.64	5.61	2.62	2.9	0.005
	(Equal variances assumed)											
Women's empowerment index	15.97	6.2	11.26	5.09	5.25	0	17.6	4.83	14.48	6.95	2.38	0.020
	(Unequal variances assumed)											

Source: Author's calculation based on the field survey (2022).

The mean difference in economic empowerment is higher. The mean differences for economic empowerment between CSR and non-CSR were 1.32. This suggests that financial empowerment was lower in non-CSR villages compared with CSR villages. Women's participation in economic activity, ownership of land and house and decisions regarding investment and spending were lower in non-CSR villages. Within CSR villages, we have analysed the difference between beneficiaries and non-beneficiaries. The mean score for economic empowerment among beneficiaries was 6.41 and for non-beneficiaries 5.36. A t-test examined the difference between the beneficiaries and non-beneficiaries in CSR villages was significant for these variables. The difference between these variables was significant. This implies that there is statistical evidence regarding economic empowerment to prove the difference between the beneficiaries and non-beneficiaries in CSR village households.

The mean level of political empowerment in CSR villages was 3.84 and in non-CSR villages 2.25. A t-test was performed to examine the relationship between the type of village and political empowerment. The relation between these variables was significant. This implies that there is enough statistical evidence regarding political empowerment to prove the difference between CSR and non-CSR farmers. The mean difference in political empowerment between CSR and non-CSR farmers was 1.59. This suggests that political empowerment was lower in non-CSR villages than CSR villages. Women's participation in political decision-making, awareness about the local operations of political parties, participation in discussions

involving women's issues, interaction with governance, including interactions with government officials and representatives, and leadership positions, whether as head of a group or committee, are found to be higher in CSR villages than in non-CSR villages. Within CSR villages, we have analysed the difference between the beneficiaries and non-beneficiaries. The mean score for political empowerment among beneficiaries was 4.21 and for non-beneficiaries 3.51. A t-test was done to examine the difference between beneficiaries and non-beneficiaries in CSR villages. The difference between these variables was not significant. This implies that there is insufficient statistical evidence to prove the difference between the beneficiaries and non-beneficiaries in CSR village households regarding political empowerment.

The mean level of social empowerment in CSR villages was 6.27 and in non-CSR villages 4.47. An investigation implies that there is enough statistical evidence regarding social empowerment to prove the difference between the CSR and non-CSR farmers. The mean difference in social empowerment between companies with CSR and those without it was 1.8. This suggests that social empowerment was lower in non-CSR villages compared with CSR villages. SHG membership, regular attendance at SHG meetings, attendance at gram sabha, independent use of public transport, independent use of private transport, perceived improvement of social status within community, within family and financial credibility, attendance at community events/activities, participation in community events/activities and interaction with local political leaders was less in non-CSR villages. We have analysed the difference between the beneficiaries and non-beneficiaries within CSR villages. The mean score for social empowerment among beneficiaries was 7.01 and for non-beneficiaries 5.61. A t-test done to examine the difference between the beneficiaries and non-beneficiaries in CSR villages. The difference between these variables was significant. This implies that there is statistical evidence to demonstrate a difference between the beneficiaries and non-beneficiaries in CSR village households in terms of social empowerment.

The mean level of women's empowerment index in CSR villages was 15.97 and in non-CSR villages 11.26. A t-test investigated the relationship between village type and women's empowerment. The relation between these variables was significant. This implies statistical evidence regarding women's empowerment to prove the difference between CSR and non-CSR farmers. The mean difference in women's empowerment between CSR and non-CSR was 4.71. This suggests that women's empowerment was lower in non-CSR villages compared with CSR villages. Economic, social and political empowerment were higher in CSR villages than in non-

CSR villages. Within CSR villages, we have analysed the difference between beneficiaries and non-beneficiaries. The mean score for women's empowerment among beneficiaries was 17.63 and for non-beneficiaries 14.48. A t-test examined the difference between the beneficiaries and non-beneficiaries in CSR villages. The difference between these variables was significant. This implies statistical evidence demonstrating a difference between beneficiaries and non-beneficiaries in CSR village households regarding women's empowerment. The CSR activities influence women's autonomy and economic participation. Dhanesh (2015) highlights how CSR-led vocational training programmes improve women's confidence and decision-making capacity in households. Similarly, Jamali, Lund-Thomsen and Jeppesen (2017) found that CSR initiatives in developing countries enhance women's access to microfinance and business skills, leading to increased financial independence. CSR efforts typically focus on education, skill development, healthcare and entrepreneurship - key areas influencing women's autonomy and economic participation (Dhanesh,2015). In conclusion, the statistically significant difference in empowerment levels underscores the value of CSR in rural development. By expanding and replicating these efforts, companies can contribute meaningfully to gender equality and community well-being.

7.3.4 Analysis of CSR and Non-CSR groups based on total index scores

The histogram represents the distribution of index scores between households with and without CSR. Graph 7.1 illustrates the distribution of CSR group scores. There are 80 data points in this group (N = 80). The histogram shows an almost normal distribution with a mean of 15.91 and a standard deviation of 6.20. A reasonably balanced and reasonable range of performance is indicated by the fact that most scores fall between 10 and 25. The histogram's shape suggests that the dataset is evenly distributed with the mean at its centre. This suggests that CSR participants typically receive higher index ratings which could reflect improved performance results, greater organisational participation or greater accountability in important areas.

Graph 7.2 illustrates the distribution of scores for the non-CSR group. There are 80 data points in this group (N = 80) with a mean of 11.26 and a standard deviation of 5.09. This skewed distribution suggests that a majority of non-CSR businesses score lower on the evaluated index which may be a result of their reduced involvement in the activities that contribute to the total index weighted 30 metric.

Figure 7 1: CSR

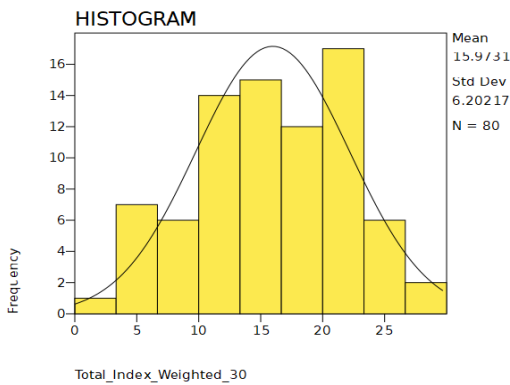


Figure 7 2: Non-CSR

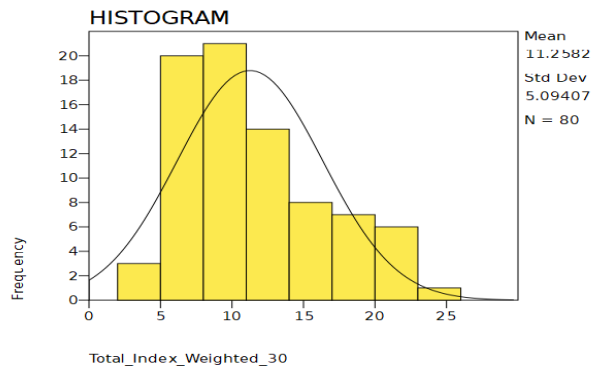
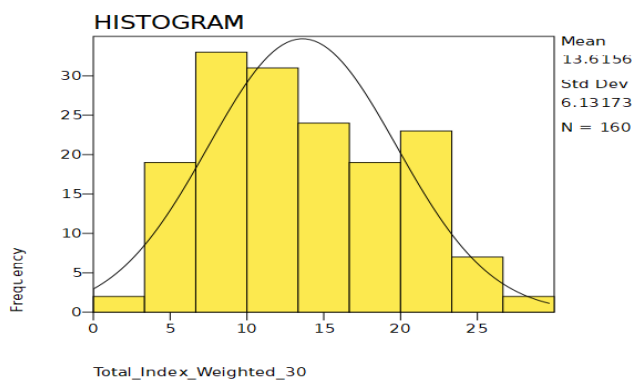


Figure 7 3: Total CSR & Non-CSR



Graph 7.3 illustrates the distribution of CSR and non-CSR group scores. There are 160 data points in this group (N = 160). A mean of 13.61 and a standard deviation of 6.13 indicate moderate variability. Due to the different performance trends of the CSR and non-CSR groups, the histogram's distribution is somewhat mixed and bimodal. The average performance for the entire sample is presented in this composite graph which provides a comprehensive overview of the complete dataset.

Graph 7.4 illustrates the distribution of scores for the CSR beneficiaries' group. There are 38 data points in this group (N = 38). The mean score was 17.63 with a standard deviation of 4.83. The distribution exhibits a slight left-skewed pattern characterised by a gradual decline as the scores increase and a higher concentration of observations in the 12–16 range. This graph illustrates that a majority of individuals or entities in this group perform relatively well on the index with fewer individuals achieving exceptionally high scores. The relatively low standard deviation suggests less variation in this group's performance as the data points are closely clustered around the mean. The curve's shape suggests a focused performance with fewer outliers and consistent scoring.

Figure 7 4:Beneficiaries

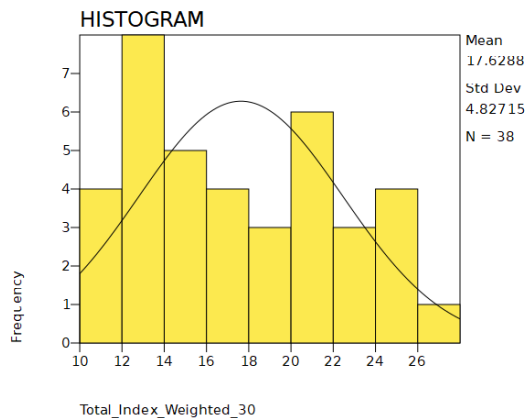
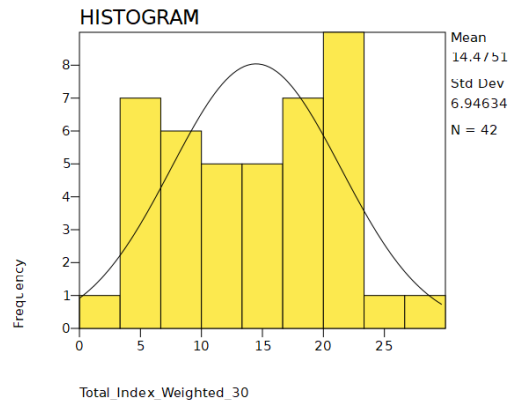


Figure 7 5: Non-beneficiaries



Graph 7.5 illustrates the distribution of scores for the CSR non-beneficiaries' group. There are 42 data points in this group (N = 42). The mean score was 14.45 with a standard deviation of 6.95. This indicates greater variability in the scores. The data reveal a wide range of scores from almost zero to more than 25 suggesting that some people have extremely low scores while others have high ones. This type of distribution suggests a group with a wide range of performance or engagement levels as indicated by the measured index. The higher standard deviation supports the finding that Group 2 produces more erratic outcomes which could be attributed to varying degrees of expertise, dedication or external influences.

7.3.5 Determinants of women's empowerment

A multiple regression analysis was conducted to determine the factors significantly influencing women's empowerment. Linear regression analysis was employed to determine the correlation between one or more independent variables and a single dependent variable (Alemu & Tewabe, 2020). The multiple regression econometric model was used to analyse factors affecting the growth of agriculture and other sectors on whether the dependent variables are dummy, continuous or censored at a certain level (Addisu, 2016; Demisew, 2018; Fikadu, 2015; Kagne et al., 2018; Giribababu, 2019; Ebrahim & Andualem, 2023; Alemu & Tewabe, 2020). This study identified essential features among possible explanatory variables using multiple linear regression.

This study's analysis used a multiple linear regression model (MLR) to evaluate the impact on women's empowerment. The study employed Women's Empowerment as the dependent variable and considered the following explanatory variables: type of Family (Joint dummy), education (Graduate or above dummy), secondary education level (Secondary Education Level dummy), and Social Category (NT, SC, ST dummy). Only significant

variables are considered for the model. We systematically removed explanatory variables that were found to be statistically insignificant from the initial regression model. After these eliminations, the final regression model was estimated.

Table 7 4: Determinants of women's empowerment

Dependent Variable and Unit	R square	Independent variables and units	B	Beta	Explanatory variable rank (according to absolute value)
Overall women empowerment	0.23	(Constant)	12.58	0	
		D2 Secondary Education Level	2.76	0.21	4
		D3 Gradution or above, Education Level	6.74	0.3	1
		D4 Joint, Type of_Family	-2.85	-0.23	3
		D7 NT, SC, ST, Social Category	3.74	0.26	2

Source: Author’s calculation based on the field survey (2022).

The multiple regression model is given below:

$$WI = \beta_0 + \beta_1TF + \beta_2ED + \beta_3SED + \beta_4CT + \epsilon$$

Where,

Dependent variable

WI- Women’s empowerment

Explanatory variables

TF - Type of family (joint dummy), ED- Education (graduate or above dummy), SED - Secondary education level (secondary education level dummy), CT - Social category (NT, SC and ST dummy).

β_0 = Intercept

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ = Coefficients of independent variables

ϵ = Error

The purpose of using women's empowerment-related variables was to test whether the associations with explanatory variables impact the dependent variables. A regression analysis method was performed to identify the key variables significantly affecting the sample households. We systematically removed explanatory variables that were found to be statistically insignificant from the initial regression model. After these eliminations, the final regression model was estimated.

This model examines the relationship between women's empowerment and four independent variables: type of family (joint dummy), education (graduate or above dummy), secondary education level (secondary education level dummy) and social category (NT, SC, ST dummy). The goal is to determine the extent to which these factors impact women's empowerment and the degree to which they contribute to it. The model explains 23 per cent of the variation in NAI ($R^2 = 0.23$). The findings indicate that all four independent variables significantly influence women's empowerment. Education level ($\beta_2 = 0.3$) impacted women's empowerment indicating a strong relationship between higher education and women's empowerment. The next highest ranked explanatory variable was social category ($\beta_4 = 0.26$) followed by joint family ($\beta_4 = -0.23$) and secondary education level ($\beta_3 = 0.21$). Higher education levels, coming from a nuclear family and belonging to NT/SC/ST communities, were associated with improved women empowerment scores. Women's empowerment was negatively related to living in a joint family and positively associated with higher education levels. Higher education has been shown to dramatically increase women's empowerment through improved economic access, decision-making skills and confidence (Dhanesh, 2015). This is supported by training and education programmes run by corporate social responsibility initiatives such as Tata Steel and Hindustan Unilever (Tata, 2021). Joint family environments restrict women's autonomy, whereas women in nuclear families report higher empowerment (Narayana, 2020). Although belonging to NT/SC/ST groups might present difficulties, marginalised women are lifted by CSR initiatives that emphasise inclusiveness and skill development (Jamali et al., 2017). All things considered, when CSR is adapted to local societal dynamics, it may positively impact empowerment. However, CSR initiatives do not always remove ingrained societal obstacles. As demonstrated in Odisha (Mohanty & Panda, 2019), caste norms and patriarchal family systems can sometimes restrict their influence. Empowerment could only be a symbolic concept without connecting education and work.

In conclusion, education, family structure and community background strongly influence women's empowerment. CSR can enhance outcomes, especially for marginalised groups, but its success depends on addressing deep-rooted social norms through inclusive and sustained efforts, similar to our study.

7.4. Usable and drinking water facilities at village level

One of India's most drought-prone areas is Marathwada. Droughts, which have been more severe in recent years, have negatively impacted the region's socioeconomic conditions. Rain-fed agriculture covers much of Marathwada and the region's agricultural output depends

heavily on the summer monsoon rains. Chhatrapati Sambhajnagar district is a part of Marathwada. This district also falls in the drought-affected zone; its average rainfall was 749 mm in 2023. The land is of good quality and the rainfall average. But many villages do not have drinking and usable water. Most of them are supplied water by tankers from March to June. Water is a scarce resource in Marathwada due to the region's high-water demand and little rainfall. Most wells in central Marathwada dry up every year around January or February. Usually dry throughout the summer, these wells resurface in July when the rain replenishes them.

Water shortage is initially indicated by the seasonal decline in well water levels, which dry up by February. The crop selections are the second sign of the region's water shortage. According to the district's socioeconomic assessment, only 12.10 per cent of the land in Chhatrapati Sambhajnagar was irrigated in 2023–2024 while the remainder was rainfed. Only a small percentage of farmers with access to irrigation can plant a second crop, whereas all farmers have the kharif crop. Cotton is the crop that rainfed farmers mostly choose because it sells for a fair price and because the monsoon can supply the water needs throughout its roughly six-month growing season. Conversely, farmers' most popular planting schedule is cultivating sorghum from October to February and pulses from June to September when irrigation is done. Before their wells dry up in late winter, they can have two crops and perhaps earn more money, thanks to these shorter-duration harvests. Many farmers claim that borewells are unsuccessful in the area which is the third sign of water shortage. In Chhatrapati Sambhajnagar, farmers surprisingly choose large-diameter open wells over borewells, even though drilling open wells is more expensive. This contrasts with most of the nation where borewells gradually replace open wells. Even though the borewells receive some water, farmers complain that the pumps usually dry up less than 30 minutes after starting.

To develop rural Chhatrapati Sambhajnagar, solve many problems and make drought-affected villages tanker-free, Janki Devi Bajaj Gram Vikas Sanstha has adopted 110 villages in Chhatrapati Sambhajnagar district under the CSR programme. The main objectives were to develop the agricultural sector, raise the water level and make the villages tanker-free.

7.4.1 Usable water sources

The present study covers the usable and drinking water facilities in villages. The data was collected through a questionnaire. Table 7.5 presents the source of usable water in these villages. Some respondents have multiple sources. As many as 55.8 per cent of sample

households use the gram panchayat's personal tap water for daily use, while 22.6 per cent and 6.9 per cent of households use individual wells and borewells, respectively. Only 40.6 per cent of CSR households use gram panchayat personal tap water, and 72.9 per cent of households use personal tap water. Households belonging to CSR villages use more well and borewell water than non-CSR households. Households belonging to CSR use wells and borewells because water is available in the sources.

Table 7 5: Usable water sources

Source of usable water	CSR		Non-CSR		Total	
	Count	Per cent	Count	Per cent	Count	Per cent
Grampanchayat common tap	46	16.67	32	13.0	78	14.9
Grampanchayat personal tap	112	40.58	180	72.9	292	55.8
The public well need to bring	7	2.54		0.0	7	1.3
Individual borewell	26	9.42	10	4.0	36	6.9
Individual well	92	33.33	26	10.5	118	22.6
Public Borewell need to bring	4	1.45		0.0	4	0.8
Other	1	0.36		0.0	1	0.2
Grand total	275		247		522	

Source: Author's calculation based on the field survey (2022).

7.4.2 Water availability through personal tap connection

Water is one of the most valuable natural resources and a national asset. The primary usage of water is in agriculture. With a plan for managing and conserving rainwater, the Indian government has given the sustainable development of rainfed areas prime importance. Additional irrigation is necessary to ensure agricultural production in rainfed areas. India is the biggest consumer of groundwater worldwide. Farmers like to irrigate their fields using groundwater. According to Pendke et al. (2017), the region's groundwater levels hit alarming levels.

Based on wells that GSDA monitors, the groundwater level trend is sharply declining in the Chhatrapati Sambhaji Nagar district. Table 7.6 presents households' responses about water availability in wells and borewells. All respondents reported that water availability was from July to October and November to February in 2016-17 in CSR villages, and 81.5 per cent responded that water was available in the wells and borewells from July to October 20216-17, and all respondent reported that in November to February 2016-17. Nearly 88 per cent of respondents reported water was unavailable in wells and borewells from March to Jun 2016-17 in CSR villages. Moreover, 59.6 per cent of respondents from non-CSR reported that water was unavailable to wells and borewells from March to June 2026-17. All respondents reported

that water availability was from July to October and from November to February 2021-22 in CSR and non-CSR villages

Table 7 6: Water availability through personal tap connection

Water Availability	CSR						Non-CSR					
	July-Oct No.	Nov-Feb No.	Mar-Jun No.	July-Oct %	Nov-Feb %	Mar-Jun %	July-Oct No.	Nov-Feb No.	Mar-Jun No.	July-Oct %	Nov-Feb %	Mar-Jun %
2016-17												
1 time a day	0			0.0	0.0	0				0.0	0.0	0.0
Once every two days	5	2		4.5	1.8	0	3	3	1	1.7	1.7	0.6
Twice a week	9	9		8.0	8.0	0	84	80	8	46.6	44.4	4.4
Once a week	98	101		87.5	90.2	0	93	97	46	51.7	53.9	25.6
Tankar	0		112	0.0	0.0	100			125	0.0	0.0	69.4
Total	112	112	112	100	100	100	180	180	180	100	100	100
2020-21												
1 time a day	2	3	1	1.8	2.7	0.9	0	0	0	0.0	0.0	0.0
Once every two days	64	62	1	57.1	55.4	0.9	14	14	1	7.8	7.8	0.6
Twice a week	14	14	5	12.5	12.5	4.5	113	114	20	62.8	63.3	11.1
Once a week	32	33	105	28.6	29.5	93.8	53	52	90	29.4	28.9	50.0
Tankar	0	0	0	0.0	0.0	0.0	0	0	69	0.0	0.0	38.3
Total	112	112	112	100	100	100	180	180	180	100.	100	100

Source: Authors' calculation based on a field survey (2022).

Only 1.1 per cent of respondents reported water was not available in wells and borewells from March to June, 2021-22 in CSR villages. Furthermore, 29.6 per cent of respondents from non-CSR reported that water was not available in wells and borewells from March to June 2026-17. Water was not available in wells and borewells from March to June in CSR villages in 2016-17, but was available in 2021-22. JBGVS has initiated soil, water conservation, water resource management and awareness programmes in CSR villages. The outcome of these activities is reflected in the above table.

7.4.3 Water availability in wells and borewells

Water is one of the most valuable natural resources and a national asset. The primary usage of water is in agriculture. With a plan for managing and conserving rainwater, the Indian government has given the sustainable development of rainfed areas first importance. Additional irrigation is necessary to ensure agricultural production in rainfed areas. India is the biggest consumer of groundwater worldwide. Farmers like to irrigate their fields using groundwater. Mankind is concerned about the depletion of groundwater supplies. According to Pendke et

al. (2017), the region's groundwater levels have hit alarming levels. Households' responses about water availability in wells and borewells are presented in Table 7.7.

Table 7 7: Water availability in wells and borewells

Water Availability	CSR						Non-CSR					
	July-oct	Nov-Feb	Mar-Jun	July-oct	Nov-Feb	Mar-Jun	July-oct	Nov-Feb	Mar-Jun	July-oct	Nov-Feb	Mar-Jun
2016-17	Count	Count	Count	Per cent	Per cent	Per cent	Count	Count	Count	Per cent	Per cent	Per cent
Water Available	92	92	11	100	100	12.0	22	27	11	81.5	100.0	40.7
Water not Available	0	0	81	0	0	88.0	5	0	16	18.5	0.0	59.3
Total	92	92	92	100	100	100	27	27	27	100	100	100
2020-21												
Water Available	92	92	91	100	100	98.9	27	27	19	100.0	100.0	70.4
Water not Available			1	0	0	1.1			8	0.0	0.0	29.6
Total	92	92	92	100	100	100	27	27	27	100	100	100

Source: Authors' calculation based on the field survey (2022).

Respondents reported that water availability was from July to October and November to February in 2016-17 in CSR villages, and 81.5 per cent of respondents from non-CSR reported water was available in the wells and borewells from July to October 2016-17, and all reported water availability in November to February 2016-17. Nearly 88 per cent of respondents reported water was unavailable in wells and borewells from March to June 2016-17 in CSR villages. However, 59.6 per cent of respondents from non-CSR reported that water was not available in wells and borewells from March to June 2016-17. All the respondents reported that water availability was from July to October and from November to February in 2021-22 in CSR and non-CSR villages. Only 1.1 per cent of respondents reported that water was unavailable in wells and borewells from March to June, 2021-22 in CSR villages. Moreover, 29.6 per cent of respondents from non-CSR reported that water was unavailable to wells and borewells from March to June, 2016-17. Water was not available in wells and borewells from March to June in CSR villages in 2016-17, but was available in 2021-22. JBGVS has taken the initiative for soil, water conservation and water resource management and awareness programmes in CSR villages. The outcome of these activities is reflected in the above table.

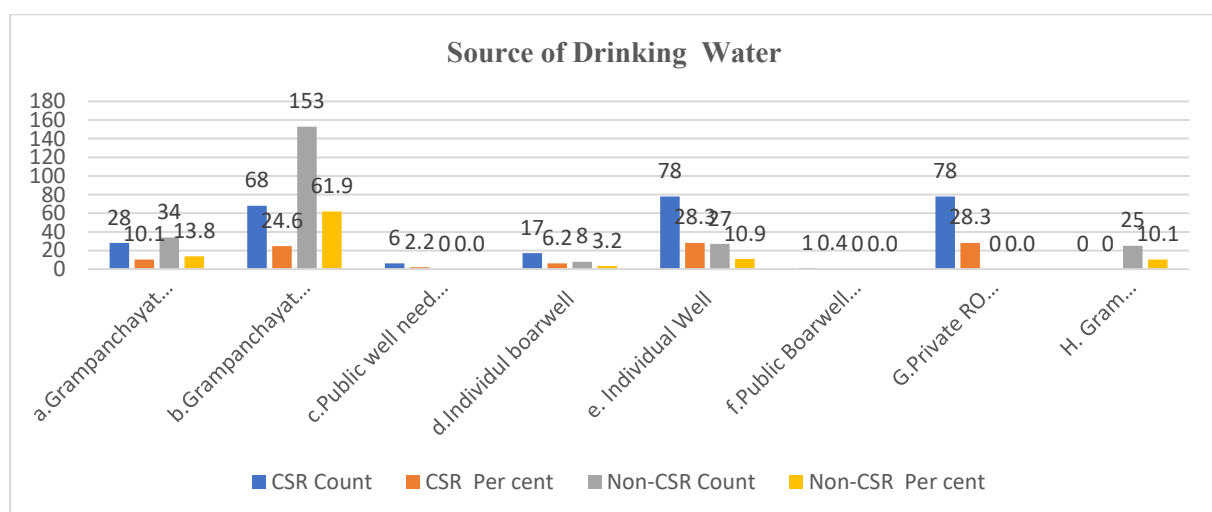
7.4.4 Source of drinking water

In non-CSR areas, the predominant source of drinking water is the grampanchayat personal tap accounting for a significant 61.9 per cent households. This indicates a high

dependence on publicly provided infrastructure at the individual household level. In contrast, only 24.6 per cent CSR households rely on this source. A similar pattern is observed with grampanchayat common taps which serve 13.8 per cent non-CSR households compared with 10.1 per cent in CSR-supported regions. These figures suggest that non-CSR areas are more reliant on government-provided community and personal tap connections for their drinking water needs. However, CSR areas exhibit a more diversified pattern of water sources. Notably, 28.3 per cent CSR households utilise individual wells, a significantly higher proportion than the 10.9 per cent in non-CSR areas. This could reflect greater autonomy or better infrastructure in CSR region, allowing households to access water independently. Furthermore, 6.2 per cent CSR respondents use individual borewells, compared with only 3.2 per cent in non-CSR areas. These figures point to increased private investment or availability of resources in CSR region to establish personalised water sources.

A striking difference is observed in the use of private R-O purified water (paid). In CSR areas, 28.3 per cent households depend on this source, while in non-CSR areas, it is completely absent. This reflects either improved financial capacity or greater awareness and availability of purified water solutions in CSR-supported communities. On the other hand, 10.1 per cent households in non-CSR areas use gram panchayat RO purified water, a public purification system that is not used at all in CSR areas possibly due to the availability of private alternatives. Some water sources are minimally used across both areas such as public wells and public borewells, where water needs to be carried manually. They account for only a small fraction of the water supply in CSR areas and are not used at all in non-CSR areas, indicating a general shift towards more convenient and direct-access systems.

Figure 7 6: Source of drinking water



Source: Authors' calculation based on the field survey (2022).

The chart clearly illustrates that CSR interventions contribute to greater diversity and quality in drinking water sources. CSR areas are characterised by higher usage of private and improved water sources such as individual wells, borewells and paid purified water. Non-CSR areas rely more on government-supplied taps and public purification systems. These trends underscore the potential of CSR efforts to enhance living conditions and infrastructure, particularly regarding access to safe and reliable drinking water.

7.5 Observations from field work

“It is not just about the availability of water facilities; it is about the availability of water itself.”

7.5.1 Insights from non-CSR villages' fieldwork

The study was conducted in CSR villages. Most farmers leave their homes early in the morning. Data was collected in villages and Vasti, a group of 10-20 houses. Women were confident in sharing information about their families and themselves. Most farmers cultivate two or three crops, with higher crop intensity. The village has many crops including cotton, maize, tomato, ginger, mosambi, vegetables and onion. Farmers have shifted from traditional crops for subsistence to cash crops for profit indicating a change in their economic strategy. Most farmers have livestock especially hybrid cows. The increase in milk production has led to a significant increase in income for farmers, with nearly 2500 litres of milk was sold in 2020-21 compared with less than 200 litres in 2016-17 in Maliwadgaon. Milk production has increased in Dinwada, with nearly 2,400 litres sold by farmers in 2016-17. Milk production has increased in Pimpalgaon with farmers selling nearly 2000 litres of milk. This has contributed to the village's economic development. CSR villages experience a steady income from labourers with some from Madhya Pradesh, providing 10-11 months of employment. Some farmers are shifting towards organic farming, and micro and smallholders are finding employment on their land. Profitable crops for farmers include onions, ginger and vegetables.

The CSR villages experienced water scarcity until 2017 with the bore well only running from July to December. From January to June the well and the bore well were dry. Most farmers use water-saving technology, but some have firm pounds (Sheat-tale), especially 10-25-acre farmers. Energy scarcity for water pumps is causing farmers to miss the right time to water their crops. Some farmers get lower prices for their crops in the market. Household respondents report sufficient water for agricultural production. They use water-saving technology, demonstrating adaptability and readiness to embrace modern farming practices.

However, some farmers face energy scarcity for water pumps, causing them to miss the right time to water their crops. Some other farmers get lower prices in the market. New vegetable and grain buyer shops have been opened, and some women have started livelihood activities through Bajaj SHGs. A total of 38 livelihood beneficiaries were interviewed in the CSR villages. The study reveals that women are more involved in agricultural cultivation, but there is a significant gender disparity in wages. Women's participation in cultivation is higher and some of them successfully handle milk collection and production. Wage rates are significantly lower in the village. Quality education is required in the village. The public/beneficiary share should decrease from 10 per cent to 5 per cent for investment in the village. Gram panchayats are poor and household income is low. Therefore, the public/beneficiary's share should be 5 per cent or less. Most households are satisfied with JBGVS's work at the village level and expect quality education at the village level. Goat farming has been promoted by JBGVS in Pimpalgaon. Livelihood activities such as livestock cannot be successful without enough water at the village level. Villagers expect another KT project for more water conservation in Pimpalgaon.

7.5.2 Insights from fieldwork in non-CSR villages

Non-CSR villages have a higher Muslim population than CSR villages. Households from non-CSR villages go to other villages for daily employment, especially after November. Non-CSR villages have good-quality soil, wells and tub-wells, but most farmers cultivate only one crop, especially cotton and maize, because of water scarcity from November to June. Most people are available in the villages all day as they do not have employment opportunities. Dairy farming and related activities are less common in the village. Only a few farmers sell milk and have hybrid cows. Some farmers have mosambi crops but provide water through tankers in summer. A dam, river, well and tubwells are available in these non-CSR villages, but water was not there.

7.6 Observations from FGD in CSR villages

A Focus Group Discussion (FGD) was conducted with women beneficiaries and local households to understand the impact of CSR on women's empowerment, livelihood development and overall village progress. This discussion shed light on various dimensions of social and economic transformation at the grassroots level, particularly in empowering women and strengthening village institutions.

Women's beneficiaries reported a significant rise in confidence, enabling them to participate assertively in household and community decision-making. With increased financial control over resources, their decision-making power within families has grown stronger. Moreover, women now enjoy greater economic independence. Their income levels have improved, and they have more freedom in managing household expenses and investing in small businesses. This financial freedom, backed by community support, has helped many of them to step out of traditional roles and become active contributors to the local economy.

The primary selection criteria include the economic condition of the household, specific livelihood needs and guarantees provided by SHGs. These groups play a vital role in ensuring accountability and proper fund utilisation. SHG members are well aware of their duties and responsibilities. They actively participate in monthly meetings which are held on the 5th of every month, maintain transaction records and play a crucial role in identifying poor and needy households which can benefit from the revolving fund. Additionally, they are responsible for passing financial resolutions, ensuring loan repayment accountability and supporting the collection and mobilisation of funds such as the Rs. 5 lakh gathered for the Farmers' Producers' Organisation (FPO).

All women involved in the FGD confirmed their participation in joint interest groups which further encourages collective decision-making and community solidarity. They expressed strong appreciation for the support provided through RFMC (Revolving Fund Management Committees). It has enabled them to purchase necessary machinery, start small enterprises and access funds without long waiting periods, which is often a barrier in traditional loan systems. The RFMC fund is utilised productively and there are plans to expand its size based on growing needs. The overarching aim is to ensure that these community funds are directed toward village-level development projects helping in long-term sustainability and self-reliance.

Institutional Framework in the village

JBGVS operates several village-level committees, all working in tandem for holistic development. These include:

FPO (Farmers' Producer Organisation) – supporting collective agricultural activities.

VDC (Village Development Committee) – addressing infrastructural and social needs.

Water Use Committee – ensuring effective water management.

SHGs (Self-Help Groups) – empowering women and promoting financial inclusion.

RFMC (Revolving Fund Management Committees)- managing revolving funds for livelihood enhancement.

The FGD also included interactions with farmer households in CSR villages. Villagers stated that only 2–3 per cent of the population is skilled, indicating a need for capacity-building and vocational training. However, thanks to JBGS's water conservation efforts, the village has wholly overcome water scarcity. This has led to a shift in agricultural practices with farmers now cultivating cash crops, particularly tomatoes, which has become the most productive crop. The change has had a positive impact on the economic condition of households. Improved crop production has increased employment opportunities, raised the wage rate and enhanced the standard of living. In addition, parents are now more aware of the importance of quality education, showing a shift toward long-term investment in human capital.

In short, the Focus Group Discussions highlight the transformative role of community-led initiatives. JBGVS is empowering women, promoting inclusive development and strengthening local governance structures which is creating a ripple effect across the villages. With better financial access, infrastructure and awareness, rural communities are on a path of sustainable growth, setting a powerful example for participatory rural development.

7.7 Challenges faced by companies while implementing CSR activities in villages

According to an RBI poll, while the contribution of agriculture has rapidly reduced, the employment proportion has not. Agriculture is undoubtedly essential to such a vast population. This affects the growth sector's inclusivity, either directly or indirectly. Consequently, it becomes crucial for public accountability and grassroots involvement (RBI, 2010). Regarding rural development in India, we mean social and economic change for the people. Improving the quality of life for those living in rural areas and closing the gap between urban and rural communities are crucial. These include food supply, road development, sanitation, drinking water and village electrification. As we previously noted, most corporations are now required to engage in CSR due to the CSR Act, 2013. Businesses must allocate 2 per cent of their net profit to corporate social responsibility. Companies spend on CSR, but few are interested in paying in villages. Some companies are working in villages under CSR activities for sustainable village development. However, companies face various issues/challenges while implementing CSR activities in villages. We have tried to identify their challenges while implementing CSR activities in villages and discussed them in two ways.

7.7.1 Challenges faced by companies in implementing CSR based on the literature

The available literature discusses the ambiguity of CSR legislation which frequently leads to varying interpretations by various organisations (Chowdappa, A., 2023). This ambiguity hinders coordination and results in projects that may fall short of community requirements. Lack of understanding of local conditions is another significant barrier. When the community stakeholders are not actively involved, many CSR programmes fail, are not long-lasting and do not address pressing social issues. This gap leads to inefficient resource usage and diminished impact. The challenge of quantifying the effects of CSR programmes increases these problems. Companies find it difficult to evaluate the actual results of their projects due to a lack of effective evaluation frameworks and expertise. According to Chowdappa, A. (2023), CSR must be incorporated into a company's basic business plan to generate long-term benefits for the society and business. Another important issue is operational obstacles. The idea that CSR is only a compliance requirement rather than a strategic investment is a problem that has been raised in several studies. This thinking frequently causes businesses to see CSR programmes as pointless endeavours without dedication or creativity. FICCI (2016) documents frequent delays in obtaining necessary permissions, especially in land acquisition for rural projects. The availability of credible NGOs, skilled human resources and medical professionals willing to work in remote areas further complicates implementation. Moreover, conflicts among local stakeholders, limited funding and weak monitoring mechanisms make it difficult to maintain transparency and effectiveness.

According to Amar and Shivashankar (2020), NGOs undermine the participative aspect of CSR and government agencies. CSR efforts frequently fail to maintain long-term advantages or garner community support without stakeholders' involvement. There is also a lack of standardised frameworks which makes CSR initiatives disjointed and unauthentic. The challenges of finding relevant social concerns that coincide with business ideals and community needs make it difficult to balance financial goals and social duties. Sustainability is still a significant issue. Research on how CSR affects rural development in India shows that many programmes are too dependent on ongoing corporate support, which puts them at risk of failing when corporate objectives change. Sateesh et al. (2024) also draw attention to the substantial political meddling (particularly at the local level), lack of internal accountability, weak strategic focus and the pervasive non-compliance with CSR expenditure obligations.

A significant urban-centric bias in CSR strategy is also criticised in the literature. Rural realities are frequently ignored, leading to culturally insensitive or failing initiatives, as Khan (2014) and Gupta & Sharma (2016) mentioned. Real-world obstacles to efficient CSR delivery

include low stakeholders' participation, lack of fundamental infrastructure and local bodies' inadequate capabilities (Das, 2017; Nair & Munshi, 2019). Another recurrent issue is corporate short-termism. According to Bansal & Sharma (2016), the pursuit of quick and reportable results frequently undermine the long-term success of CSR initiatives. KPMG (2018) noted that inadequate monitoring and assessment systems increase the discrepancy between reported and real results, especially in remote villages. Moreover, regulatory ambiguities (PWC, 2015), cultural and language barriers (Taneja et al., 2011) and corruption (Transparency International India, 2018) further impede successful CSR execution. Finally, Bhattacharya et al. (2010) caution against the tendency of companies to prioritise brand promotion over addressing genuine social needs.

In conclusion, the literature consistently calls for a shift toward a more participative, transparent and community-driven approach to CSR. Building robust partnerships with local stakeholders, aligning CSR activities with local needs, ensuring transparency and adopting a long-term strategic vision are key recommendations for overcoming the identified challenges.

7.7.2. Challenges faced by JBGVS while implementing CSR

The Janakidevi Bajaj Gram Vikas Sansthan (JBGVS) has played a vital role in encouraging agricultural growth and women's empowerment in the villages of Chhatrapati Sambhajinagar district. Nevertheless, JBGVS encountered several challenges while implementing CSR activities in villages. One of the primary challenges faced by JBGVS at the beginning of this project was deep-rooted misconceptions about companies and NGOs. Many villagers believed that these organizations had hidden agendas, suspecting them of seeking profits or exploiting local resources under the guise of social work. Another challenge faced is the general ignorance of people about the CSR programme. Many villagers are unaware of the benefits of CSR activities for the development of villages. The distance between the JBGVS office and the CSR-adopted villages was extended, making monitoring all CSR work in the villages challenging. JBGVS also faces legal problems in villages. Permission from Tahasil, Collector's office and Grampanchayat is required to implement CSR activities at villages. This is a complicated process that takes a long time, negatively affecting the CSR outcome.

Adding to these problems was the villagers' expectation for immediate results. Many community members anticipated quick, tangible benefits from the initiatives. When outcomes took time to materialize, as they naturally do in sustainable development projects, disappointment and impatience set in. Some of the projects needed time for better results, but in some of the villages, the villagers' accusations questioned the organisation's commitment.

When they got the results, they started to praise the Organisation. When people do not trust, it becomes challenging to sustain their cooperation and support. Infrastructure issues, particularly related to agricultural roads, posed another significant barrier. Poor road connectivity hampered the transportation of materials, limited market access, and made it difficult for program staff to reach certain areas. Efforts to improve drainage systems also met with resistance, as farmers were reluctant to give up portions of their land for public benefit, even to improve agricultural productivity in the long run.

The shortage of trained personnel is further found for the quality of implementation. Practical rural development work demands technical skills, a deep understanding of local contexts, strong communication abilities, and the patience to work through social resistance. Finding individuals with this combination of traits was a persistent challenge that affected the speed and effectiveness of program execution. Rural local politics is one of the challenges in adopting the villages and implementing CSR activities in the villages. Local politician has their interests at the village level. If local politicians do not seek personal advantages, they actively oppose CSR work. They sowed distrust among villagers or placed demands that diverted resources and attention from genuine development work. The interplay of local politics with development activities often complicated village adoption and obstructed the smooth implementation of planned interventions.

7.8 Summary

The present chapter describes the impact of CSR on women's empowerment. Water availability was observed after intervention in CSR villages. Also, we have explained the challenges companies and JBGVS face while implementing CSR at the village level. Despite these many challenges, the JBGVS has been working efficiently, which has contributed to changing the lives of villagers. Effective development projects must be designed and implemented with an understanding of the social, political, cultural, administrative, and infrastructure realities on the ground. Despite such formidable challenges, substantial and long-lasting change is still possible with persistence, attention to local requirements, and flexible tactics.

Chapter-8

Summary and Conclusion

8.1 Introduction

This chapter describes the background and outcomes of the study. It has been classified into five sub-sections: Section 8.2 highlights the summary of results. Section 8.3 covers the significant findings of the study. Section 8.4 explains its conclusion. Finally, Section 8.5 makes policy recommendations and suggestions based on the findings.

8.2 Summary

The present study looks into the impact of CSR. Thus, this study has been divided into studies of CSR spending and the impact of CSR on agricultural growth and women's empowerment. The former focuses on the farm sector's economic, social and ecological aspects. In contrast, women's empowerment focuses on economic, political and social factors such as the analysis, trends and patterns of CSR spending in India and Maharashtra based on readily available CSR portal published by the Ministry of Corporate Affairs, India. Primary data was used to assess CSR activities related to agricultural growth and women's empowerment in Chhatrapati Sambhajnagar district, Maharashtra. This study selected six villages for the analysis three adopted villages under CSR activities and three villages excluded from CSR activities. Economic variables like production, productivity, employment, crop intensity, crop diversity and cropping pattern are considered for the study. Social factors such as per capita foodgrain availability, foodgrain self-sufficiency and knowledge of agri-related government schemes are considered for the study, and ecological factors such as knowledge of the use of agri-technology, knowledge of the use of water and cultivation technology and practices of eco-friendly farming are considered for agricultural growth analysis. Economic, political and social factors have been used to analyse women's empowerment. This analysis uses secondary data from various government sites with different tables, figures and models.

8.3 Major findings

The significant findings are based on three objectives. The first objective is to assess the impact of CSR on agricultural growth and women's empowerment. The analysis is subdivided into Chapters 6 and 7. Each chapter follows a different level of investigation and findings. Hence, their results have been presented separately.

8.3.1 Findings from CSR spending data

One of the objectives was to analyse the trends and patterns of CSR spending in India. We have analysed and made findings.

- The average annual growth rate (AAGR) of CSR was 15.4 per cent, while the CAGR was 14.5 per cent, in the period of CSR spending 2011-12 to 2021-22. The CSR spending growth rate was negative in 2021-22 due to COVID-19 which negatively impacted the growth rate of the industrial sector. This is reflected in the overall decline in CSR spending during that period. The continuous increase in CSR spending demonstrates the country's economic growth.
- The highest percentage of CSR spending at 15.56 per cent and the highest total CSR spending of Rs. 23885.79 cr. from 2014-15 to 2021-22 was in Maharashtra. As it is industrially most developed among all the states, possibly boasting the broadest industrial base. Karnataka has a share of 5.82 per cent and total spending of Rs. 8942.74 cr., while Gujarat has 5.07 per cent share and its spending was Rs. 7777.44 cr. Their spending levels are lower than Maharashtra but still significantly higher than Tripura, Nagaland, and Mizoram, Tripura (0.04%, Rs. 63.51 cr.), Nagaland (0.02%, Rs. 27.61 cr.) and Mizoram (0.01%, Rs. 12.11 cr.). From 2014-15 to 2021-22, there has been very low spending and minimal percentage shares.
- The education and health sectors account for 50 per cent of total CSR spending across all development sectors. This underscores their critical role in national development planning and corporate social responsibility priorities. In contrast, women's empowerment and safe drinking water are the least funded with Rs. 1563.9 cr. (1.0%) and Rs. 1525.9 cr. (1.0%) respectively. Only two sectors account for more than half of CSR spending, suggesting concentration on infrastructure, social welfare, or economic growth.
- The sectors with the highest AAGR, 62.2 per cent, and CAGR of, 21.4 per cent were poverty, eradication of hunger and malnutrition. This indicates that despite temporary fluctuations, they remained among the most dynamic and prioritized in CSR spending. The data indicates that certain sectors particularly poverty, eradicating hunger and malnutrition, health care and vocational skills performed well over the long run. In contrast, education and rural development projects grew at a slower pace, suggesting potential structural issues.

- CSR spending by PSUs was 28 per cent in 2014-15 and decreased drastically to 16.6 per cent in 2021-22. Meanwhile, the share of non-PSU in CSR spending increased by 72 per cent and 83.4 per cent from 2014-15 to 2021-22. This trend highlights that private-sector industrial development contributes to overall industrial development.
- Maharashtra recorded a CSR growth rate of 40.18 per cent, while the national growth rate stood at 44.22 per cent in 2015-16. However, the following years show significant volatility with sharp declines and rebounds. In Maharashtra, the CSR spending growth rate dropped to 19.41 per cent, while India's growth rate fell drastically to just 0.17 per cent. This decline is attributed to external economic shocks, policy changes or sectoral downturns. Maharashtra experienced a recovery in CSR spending in 2021–22, while India saw a significant decline of -1.06 per cent. CAGR is essential for evaluating long-term economic trends. India's CAGR stood at 14.5 per cent, whereas Maharashtra's was 16.43 per cent. This showed that Maharashtra maintained a more stable long-term CSR spending trajectory than India.
- Mumbai City district has received 17.75 per cent of Maharashtra's total CSR spending, followed by Pune with 10.43 per cent and Thane with 3.4 per cent during 2014-15 to 2021-22. In contrast, Washim, Hingoli and Yavatmal received 0.04 per cent, 0.02 per cent and 0.05 per cent respectively. CSR has been concentrated in western Maharashtra, while other regions have been largely neglected. The unmentioned data accounts for 55.22 per cent, the highest share, and it does not give us a clear picture of CSR spending.
- Sector-wise, CSR spending is significantly unequal in Maharashtra. The education sector has received the highest (42.00%) CSR expenditure during the eight years (2014-15 to 2021-22). The health sector followed closely with 41.00 per cent, while the environmental sector received 6 per cent and the rural development sector accounted for 5.2 per cent of CSR spending during 2014-15 to 2021-22. Slum area development received 0.1 per cent, much less than in the education and health sectors. The education and health sectors have received more than 80 per cent of CSR spending. The rural development sector has also received a low percentage of CSR expenditure in Maharashtra.
- The growth rate of CSR spending on rural development in Maharashtra saw a sharp rise from 20.6 per cent in 2015-16 to 88.2 per cent in 2016-17. However, there is tremendous volatility in the following years, with significant drops and rebounds. CSR spending on rural development witnessed a sharp decline with the growth rate dropping

to -25.5 per cent. The CAGR is essential to evaluate long-term economic trends. The CAGR of rural development in Maharashtra was 14.5 per cent, while overall Maharashtra's CSR spending CAGR was 16.43 per cent. These trends showed that Maharashtra maintained a more stable long-term CSR spending track in overall spending, but not in the village development sector.

- CSR spending in Chhatrapati Sambhajnagar district was 451.81 Cr.. Its CAGR was 11.10 per cent from 2014-15 to 2021-22. However, within these years, two consecutive years (2017-18 and 2018-19) experienced negative growth rates of -0.38 per cent and -0.58 per cent. Since the overall CAGR remained positive and relatively high at 11.10, the spending witnessed significant growth, but compared to Maharashtra's CAGR, it was lower.

8.3.2 Findings from the primary data/field survey

8.3.2.1. Agricultural growth

One objective of this research was to assess the impact of CSR activities on agricultural growth and women's empowerment. We have found the following findings from the assessment.

- The caste status of households shows that about 44.5 per cent respondents belonged to general category, 40.1 per cent to OBCs, 6.6 per cent to SCs and 5.8 per cent to NTs. The remaining 0.3 per cent were from the ST category. CSR households accounted for 41.2 per cent and belonged to the general category, while non-members accounted for 48.2 per cent.
- The dependency ratio for CSR was 25.6 and for non-CSR 25.7 per cent. Nearly 25 per cent of the total population was dependent.
- The mean age of CSR households was 48 years and that of non-CSR households 50.4. Standard deviation of CSR respondents was 12.7 years and non-CSR respondents 12.2 years.
- The average land holding was 1.8 ha. and 1.7 ha. of CSR and non-CSR households respectively. No significant difference was found in household land holding because the sample selection of farmers was proportional. Differences were found in land under irrigation between CSR and non-CSR villages.
- The mean land area under irrigation in CSR villages was 1.3 ha, and that of non-CSR villages 0.9 ha. Mean land holding under irrigation was higher in CSR villages than in non-CSR villages. The standard deviation of irrigation was 1.1 ha for CSR villages and 1.2 ha for non-CSR villages. Non-CSR villages have higher SD than CSR villages,

which means there is more inconsistency in non-CSR villages than in CSR villages. In short, in non-CSR villages, some households have more irrigated land, while others have minimal irrigation land.

- The mean livestock in CSR villages was 3.9 and that in non-CSR villages 2.0. Mean livestock was higher in CSR villages than in non-CSR villages. The livestock's standard deviation was 8.3 for CSR and 2.9 for non-CSR. CSR villages have a higher SD than non-CSR villages which means that in CSR villages, some households have a higher number of livestock, while others have few.
- The average net annual income of CSR households was Rs. 1,87,381. It was Rs. 1,18,792 in non-CSR households, significantly less than the average NAI of CSR farmers. The selection of farmers remains proportionally significant, a difference observed in men of NAI. According to the Ministry of Agriculture & Farmers' Welfare, the average NAI of Indian farmers was Rs. 1,22,616. The average NAI of CSR farmers is higher than India's average NAI, but the average NAI of non-CSR farmers is less than India's mean NAI.
- Approximately 68.5 per cent of the respondents have livestock. As many as 77.7 per cent are CSR farmers and 57.7 per cent are non-CSR farmers. Livestock availability in CSR villages was significantly higher than in non-CSR villages.
- Nearly 79.8 per cent of farmers have irrigation facilities in both villages. But CSR village farmers have 87.6 per cent more facilities than non-CSR farmers (70.8%). The relation between these variables was significant. This implies statistical evidence that more CSR farmers have irrigation facilities than non-CSR farmers.
- Approximately 75.3 per cent of the CSR-IP farmers have adopted micro-irrigation and in non-CSR villages only 42.9 per cent have adopted micro-irrigation. Micro irrigation adoption in CSR villages was higher than in non-CSR villages.
- The mean of NIA in CSR villages was 1.45 ha and in non-CSR villages 1.21 ha. The mean GIA in CSR villages was 2.32 ha and in non-CSR villages 1.1 ha. The relation between these variables was significant. The mean difference of NIA was 0.24 ha and GIA was 1.22 ha. This shows that in non-CSR villages, more cropped area is cultivated during the kharif season and very little during the rabi season. GIA considers the sum of the land irrigated yearly and the area irrigated more than once. When water availability and irrigation are limited, GIA is lower. Furthermore, in non-CSR, GIA is less.

- The mean GAC of CSR villages was 2.55 ha and non-CSR 1.9 ha in 2020-21. The mean difference was 0.65 ha. Mean GCA was higher in CSR villages after CSR was implemented in CSR villages. A t-test was performed to examine the difference between CSR and non-CSR villages and it was significant in 2020-21. This implies that GCA was significantly higher in CSR villages than in non-CSR villages.
- The mean GAC of (intra-CSR) CSR-IP was 1.5 ha and CSR-NIP at 1.12 ha in 2016-17, but was not statistically significant. GAC of CSR-IP was 2.74 ha and CSR-NIP 1.17 ha in 2020-21 and it was statistically significant. The GCA difference between CSR-IP and CSR-NIP was significant in 2020-21.
- The growth mean for CSR, CSR-IP and CSR-MI was 1.09 ha, 1.24 ha and 1.44 ha respectively. Non-CSR, CSR-NIP and CSR-NMI it was 0.31, 0.05 and 0.63 respectively. A comparative difference was higher between them. These differences are statistically significant.
- The cropping intensity index was statistically significant in CSR, CSR-IP and CSR-MI. This indicates that cropping intensity and irrigation have a positive relationship. The mean of GIA in CSR villages was 2.32 ha, and in non-CSR, it was 1.1 ha in 2020-21, and the cropping intensity index for CSR villages was 202.2 and 126.6 for non-CSR, which shows higher irrigation and higher cropping intensity.
- Among all the crops, cotton was a widely cultivable crop in both CSR and non-CSR villages. In non-CSR villages, cotton cultivation area contributes 47.5 per cent, while in CSR villages 28.4 per cent is used for cotton cultivation. Maize and wheat are the two primary cereal crops cultivated in CSR villages, i.e., 20.8 per cent and 11.5 per cent respectively. Vegetables and fruits are crucial in diversifying agricultural income and ensuring food security. Onion is widely grown in CSR villages (10.9 ha) and CSR-MI (9.3 ha). Tomatoes are cultivated in CSR (5.5%) and CSR-MI (7.2%). Ginger is grown in regions CSR (5.8%) and CSR-MI (7.5%) villages.
- The mean HI for CSR-IP was 0.73 and CSR-NIP was 0.32. The difference in mean HI was 0.4. For farmers with irrigation facility HI were higher than all CSR farmers which means irrigation promotes crop diversification. The difference in HI was statistically significant for CSR-IP and CSR-NIP. The mean HI for CSR-MI was 0.76 and for CSR-NMI, it was 0.64. Crop diversification is found in farmers with irrigation facilities and those adopting micro-irrigation. Farmers who have irrigation facilities cultivate multiple crops including rabi and summer which reflects more diversification. HI for

CSR-MI adopters was higher than for farmers from CSR villages and CSR farmers with irrigation facilities. (HI for CSR-MI- 0.76, CSR-IP-0.73 and CSR-0.62).

- The mean MEI for CSR villages was 0.89, and for non-CSR villages 0.69. The mean difference was 0.20. Results indicate significant differences in the MEI levels of CSR and non-CSR farmers. In short, higher MEI was in CSR villages than in non-CSR villages.
- The mean CEI for CSR villages was 0.67, and for non-CSR villages 0.45. The mean difference was 0.22. Significant differences were found between the CEI levels of CSR and those of non-CSR farmers. The mean CEI for CSR-IP was 0.72 and for CSR-NIP 0.32. The mean difference was 0.40. The higher CEI was in CSR-IP than in CSR-NIP farmers. The mean of CEI for CSR-MI was 0.75 and for CSR-NMI, it was 0.64. Significant differences exist in the CEI levels of CSR-MI farmers and CSR-NMI farmers. CEI for CSR-MI adopters was higher than for farmers from CSR villages and CSR farmers with irrigation facilities. (CEI for CSR-MI: 0.75, CSR-IP: 0.72 and CSR: 0.67).
- The mean production for K maise, K ginger, K onion, K tomato, and R gram of commercial crops such as cotton, ginger, onion and tomato was higher among non-CSR farmers. The difference between CSR and non-CSR farmers' mean production levels of K maize, K tomato and R gram was statistically significant. Most crops ' mean production levels per crop are not significantly higher, although total production levels are higher in CSR villages.
- The mean productivity of K maize, K cotton, K ginger, K tuar, K onion, K bajra, K tomato, R gram, R onion and R heat was higher in CSR villages than in non-CSR villages. The productivity of most crops was substantially higher in CSR villages than in non-CSR villages.
- The average NAI for CSR farmers was Rs.187,351, and for non-CSR farmers Rs.118,792. The average NAI of CSR farmers was significantly higher than non-CSR farmers.
- The mean NAI of marginal farmers, small farmers, semi-medium farmers and medium farmers was higher in CSR villages than in non-CSR villages. The average NAI of all types of CSR villages was significantly higher than that of non-CSR farmers.
- The study found that the mean NAI of the agriculture and agri-allied sectors was significantly higher in CSR villages than in non-CSR villages. Mean NAI difference

between CSR and non-CSR was insignificant for other sectors which include income from business, salary and daily wage labour.

- Mean NAI from the dairy and other agri-allied sectors was significantly higher in CSR villages than in non-CSR villages. Income from goat was statistically significantly higher in CSR villages.
- The average NAI for CSR-IP farmers was Rs. 2,02,377 and for CSR-NIP farmers it was Rs. 80,917. A t-test was conducted to determine whether there was a significant difference in NAI between CSR-IP and CSR-NIP farmers. The average NAI of CSR-IP farmers was significantly higher than that of CSR-NIP farmers.
- The impact of irrigation on annual net income at the farm level is presented in Table 6.13. The average NAI for CSR-MI farmers was Rs.2,32,055; for CSR-NMI farmers, it was ₹111,929. A t-test was conducted to determine whether there was a significant difference in NAI between CSR-MI and CSR-NMI farmers.
- The mean NAI of the agriculture and agri-allied sectors was higher in CSR-MI villages than in CSR-NMI farmers. The average NAI of the agricultural sector and agri-allied sector was higher for CSR-MI farmers than for CSR-NMI farmers. Mean difference between CSR-MI and CSR-NMI was not statistically significant in other sectors which include income from business, salary and daily wage labour.
- The mean number of external labourers per crop was double in CSR villages compared with non-CSR villages. The mean difference between them was 2.04. The mean number of external labourers per crop of CSR farmers was significantly higher than that of non-CSR farmers. The mean of total external labour days per crop and total family labour days per crop was statistically significantly higher in CSR villages than in non-CSR villages. The mean of family labour per crop and family labour per day was significantly higher in CSR-MI farmers than in CSR farmers. The lower mean of family labour per crop is because the population or family size cannot be changed due to improvements in irrigation.
- The mean number of external labourers per crop of CSR-MI farmers was significantly higher than that of CSR-NMI farmers. The mean of total external labour days per crop and total family labour days per crop was statistically significantly higher for CSR-MI farmers than CSR-NMI farmers. The mean of family labour per crop was considerably higher in CSR-MI villages than in CSR-NMI farmers. The mean of family labour per day was higher in CSR villages than in non-CSR villages.

- The availability of livestock was higher in CSR villages than in non-CSR villages. The mean NAI of CSR farmers' share of the agri-allied sector was 23,871 in CSR villages and 6,055 for non-CSR farmers. The difference was statistically significant, meaning the role of the agri-allied sector was significant in the total mean NAI of CSR farmers.
- The mean of the total livestock count in CSR villages was 3.86 and in non-CSR villages 1.97 in 2020-21. The mean difference was 1.89. The mean total livestock count was higher in CSR villages than in non-CSR villages. The mean difference in total livestock count between CSR and non-CSR villages was statistically significant. This implies that the mean of the total livestock count in CSR villages was higher than in non-CSR villages. The mean local cow count in CSR villages was 0.46, and in non-CSR villages 6.62. The mean difference was -0.15. The mean local cow count was higher in non-CSR villages than in CSR villages.
- The mean number of cross-bred cows in CSR villages was 1.37 and in non-CSR villages 0.64. The mean difference was 0.73. The number of cross-bred cows was higher in CSR villages than in non-CSR villages. The mean of cross-bred cow count in CSR villages was significantly higher than in non-CSR villages. The higher mean of cross-bred cows indicates the development of dairy farming in CSR villages.
- The mean NAI of dairy farming of CSR farmers was Rs. 18,304 and that of non-CSR farming Rs. 3,851. The difference was statistically significant and this improvement enhances the total NAI of farmers, as evidenced by the mean NAI of CSR farmers being Rs.1,87,351 Rs. and that of non-CSR farmers Rs. 1,18,792.
- The mean total per capita food grain in CSR villages was 0.12 quintals while in non-CSR villages it was 0.07 quintals. The mean difference was 0.05. The total per capita food grain was higher in CSR villages than in non-CSR villages. The CSR villages' mean per capita food grain was significantly higher than that in non-CSR villages. CSR-IP farmers' mean per capita food grain was significantly higher than that of the CSR-NIP farmers. CSR-MI farmers' mean per capita food grain was significantly higher than that of the CSR-NMI farmers.
- Nearly 80.4 per cent farmers in CSR villages reported accessing various government agri-related schemes in the last five years, while 77.9 per cent of farmers responded that they accessed various government agri-related schemes in non-CSR villages. The difference between CSR and non-CSR villages was not significant. Among all the agri-

related government schemes, PMKSN and Crop Insurance Scheme are accessed by farmers from both types of villages.

- Nearly 71.6 per cent of farmers in CSR villages knew the use of agri-technology, while only 40.47 per cent of farmers knew in non-CSR villages. The level of knowledge about the use of agri-technology among farmers in both CSR and non-CSR villages significantly differs. Farmers in CSR-MI had more knowledge than other farmers. They use various water-saving technologies and cultivation technologies. Farmers with higher education levels also use more technology in the agricultural sector.
- Farmers' knowledge of water use and cultivation technology was significantly higher in CSR villages than in non-CSR villages. Farmers in CSR-MI had more understanding of water use and cultivation technology than other farmers. They use various water-saving and cultivation technologies.
- As many as 24.7 per cent CSR village farmers and 6.0 per cent of non-CSR village farmers have adopted eco-friendly agricultural practices. By CSR-MI farmers it was higher by others. Besides, 48 sample farmers had conducted soil testing in CSR villages and 40 farmers understood the importance of soil testing through JBGVS. Eight farmers came to know through VDCS. JBGVS has conducted various training programmes and field visits to other villages through CSR activities. It has encouraged farmers to adopt eco-friendly practices in their agricultural farming for sustainable development.

Model Interpretation

- NIA of farmers is significantly influenced by gross irrigated area, net sown area, single land ownership, joint family structure and education (graduate or above). The goal is to determine how these factors affect farmers' income and how much of a difference they make in NAI. Gross irrigated area ($\beta_1 = 0.42$) impacted NIA, indicating a strong relationship between the extent of irrigation available to farmers and their net annual income. The following highest-ranked explanatory variable was the net sown area ($\beta_2 = 0.20$), followed by the farmers' education level (graduate or above, $\beta_6 = 0.16$) and joint family ($\beta_4 = 0.08$). Single land ownership ($\beta_3 = -0.10$) was associated with reduced NAI. Although being a graduate or having a higher level of education has a higher correlation with income level, on average, it results in a significant increase in NAI when other factors are constant. Most educated farmers have adopted modern water-saving technologies in their agriculture and have multiple income sources.

Therefore, education plays a vital role in NAI. In short, irrigation, NSA and education are positively associated with NAI.

- Model 2 examined GIA ($\beta_1 = 0.57$) and NSA ($\beta_2 = 0.25$) which substantially impacted NAIA. This indicates a strong relationship between the extent of irrigation available, the net sown area of farmers and their net annual income from agriculture. The significant association between NAIA and only two factors - gross irrigated area and net sown area - explains the successful impact of the intervention programme.
- Model 3 shows that CSR village ($\beta_1 = 0.25$), NSA ($\beta_2 = 0.16$) and CSR-MI adopter ($\beta_3 = 0.11$) substantially impacted NAIAA, indicating a strong relationship. The association between NAIAA and the age group young (35-64) and old (65 or above) was negatively associated. ($\beta_4 = - 0.19$ and $\beta_5 = - 0.17$). Respondents in the 15-35 age group were more actively involved in dairy and goat farming compared with other age groups.
- Model 4 found that NSA ($\beta_3 = 0.75$) impacted GCA, indicating a strong relationship between the net sown area and gross crop area. The next highest ranked explanatory variable was the net sown area ($\beta_2 = 0.29$), followed by CSR village ($\beta_1 = 0.06$) and single land ownership ($\beta_3 = 0.05$) which were positively associated with GCA but had a weak association with GCA.
- Crop diversity, measured using HI, MEI and CEI indices, was positively associated with the CSR intervention, land size, irrigation and micro-irrigation.
- Model 10 found that the gross irrigated area of the GIA impacted growth in the gross cropped area.
- Productivity measures production per unit of land area utilised. It was strongly associated with adopting micro-irrigation practices, followed by the gross irrigated area. Micro-irrigation adopters cultivated high-yield crops such as tomatoes, ginger and onions. Joint-type families have more land, multiple irrigation sources and knowledge about production technology, and, therefore, productivity per ha is high.
- All the four independent variables significantly impacted ELPC. The gross irrigated area ($\beta_1 = 0.17$) substantially impacted ELPC, indicating a strong relationship between micro-irrigation and TPr. The next highest ranked independent variables were net sown area ($\beta_3 = 0.15$), CSR village ($\beta_1 = 0.13$) and micro-irrigation. ($\beta_4 = 0.13$).

8.3.2.2 Women's empowerment

- The caste status of households shows that about 39.4 per cent belonged to general category, 36.9 per cent to OBCs, 9.4 per cent to SCs and 8.8 per cent to NTs. The remaining 5.6 per cent are from the STs category. CSR households accounted for 36.6 per cent and belonged to the general category, while non-members accounted for 42.5 per cent.
- Literacy and educational attainment are determinants of women's empowerment. Table 7.1 shows that 21.3 per cent respondents are illiterate, 31.3 per cent completed upper primary education, 28.8 per cent secondary education, 11.9 per cent completed higher secondary education and only 6.9 per cent finished graduation.
- The mean level of economic empowerment in CSR villages was 5.86 while in non-CSR villages it was 4.54. The relation between these variables was significant. Within CSR villages the mean score for economic empowerment among beneficiaries was 6.41 and for non-beneficiaries 5.36.
- Women's participation in economic activity, ownership of land and house and decisions regarding investment and spending was lower in non-CSR villages.
- Women's political empowerment was lower in non-CSR villages than in CSR villages. Their participation in political decision-making, awareness about the local operations of political parties, participation in discussions involving women's issues, interaction with governance, including interactions with government officials and representatives, and leadership positions, whether as head of a group or committee, are found to be higher in CSR villages than in non-CSR villages.
- Within CSR villages, the difference between beneficiaries and non-beneficiaries in political empowerment was insignificant.
- Social empowerment was lower in non-CSR villages compared with CSR villages. SHG membership, regular attendance at SHG meetings, attendance at gram sabha, independent use of public transport, independent use of private transport, perceived improvement of social status within community, perceived improvement of social status within family, perceived improvement of financial credibility, attendance at community events/activities, participation in community events/activities and interaction with local political leaders was lower in non-CSR villages than CSR villages.

- We have examined the difference between the beneficiaries and non-beneficiaries in CSR villages. The difference between these variables was significant.
- The mean level of women's empowerment index in CSR villages was 15.97 and in non-CSR villages it was 11.26. The mean difference in women's empowerment between CSR and non-CSR was 4.71. This suggests that women's empowerment was lower in non-CSR villages compared with CSR villages. Economic, social and political empowerment were higher in CSR villages than in non-CSR villages.
- Within CSR villages, the mean score for women's empowerment among beneficiaries was 17.63; for non-beneficiaries, it was 14.48. The difference between these variables was significant. This implies sufficient statistical evidence demonstrating that women's empowerment was higher for beneficiaries than non-beneficiaries in the CSR village women's households.
- Women empowerment model examined the relationship between women's empowerment and four independent variables: type of Family (joint dummy), education (graduate or above dummy), secondary education level (secondary education level dummy) and social category (NT, SC and ST dummy). All the four independent variables influence women's empowerment. Education ($\beta_2 = 0.3$) impacted women's empowerment, indicating a strong relationship between higher education and women's empowerment. The next highest-ranked explanatory variable was social category ($\beta_4 = 0.26$), followed by joint family ($\beta_4 = -0.23$) and secondary education level ($\beta_3 = 0.21$). Higher education, coming from a nuclear family and belonging to NT/SC/ST communities, was associated with improved women empowerment scores. Women's empowerment was negatively related to living in a joint family and positively associated with higher education level.

8.3.2.3 Usable and drinking water

- Some respondents have multiple sources. As many as 55.8 per cent sample households use the gram panchayat's tap water daily. But 22.6 per cent and 6.9 per cent of households use individual wells and borewells respectively. Only 40.6 per cent of CSR households use gram panchayat personal tap water and 72.9 per cent of households use personal tap water.
- All respondents reported that water was not available through the gram panchayat's tap and a tanker provided usable water from March to June 2016-17 in CSR villages. In non-CSR villages, 53.9 per cent households reported that water was available from the

gram panchayat's tap and 38.3 per cent respondents reported that water was provided by a tanker and it was not available from March to June 2016-17. Water availability was higher in non-CSR villages than in CSR villages from March to June 2016-17. Water availability was higher in CSR villages than in non-CSR villages from March to June 2020-21.

- All respondents reported that water availability was from July to October and November to February in CSR villages, and 81.5 per cent responded that water was available through the wells and borewells from July to October 2016-17, and all reported it in November to February 2016-17.
- Nearly 98 per cent respondents from CSR villages and 70.4 per cent respondents from non-CSR villages reported that water was available from wells and borewells from March to June 2020-21. JBGVS has initiated soil, water conservation, water resource management and awareness programmes in CSR villages. The outcome of these activities is reflected in the result.

8.3.2.5 Findings from field observation and FGD

- Of the 362 sampled households, 95.9 per cent are male-headed and 4.1 per cent female-headed. The percentage of female-headed households is lower, with 4.1 per cent for CSR and non-CSR households. In both study categories, the majority of farmers are men. Despite the lack of female-headed households, the percentage of women employed in agriculture was greater than that of males, according to the village survey.
- Farmers have shifted from traditional crops for subsistence to cash crops for profit, indicating a change in their economic strategy. Most farmers have livestock, especially hybrid cows. The increase in milk production has led to a significant increase in the income for farmers, with nearly 2500 litres of milk sold in 2020-21 compared to less than 200 litres in 2016-17 in Maliwadgaon. Milk production has increased in Dinwada, with nearly 2,400 litres sold by farmers in 2016-17, and in Pimpalgaon, farmers sold nearly 2000 litres of milk. This contributed to the village's economic development.
- CSR Villages are experiencing a steady income from labourers with some from Madhya Pradesh providing 10-11 months of employment. Some farmers are shifting towards organic farming, and micro and smallholders are finding employment in their land. Profitable crops for farmers include onions, ginger and vegetables.
- The study reveals that women are more involved in agricultural cultivation, but there is a significant gender disparity in wages in the agricultural sector. Women's participation

in cultivation is higher and some of them successfully handle milk collection and production.

- Labourers from non-CSR villages migrate/move for daily employment purposes in CSR villages. For instance, labourers from Mategaon go to Pimpalgaon for employment. Labourers from other districts and states such as Madhya Pradesh have migrated to CSR villages. In the CSR village, farmers cultivate tomatoes, onions and vegetables which require a large labour force. Farmers who have land in non-CSR villages work as agricultural labourers in CSR villages. Most people leave their villages for employment in the morning and return to their villages in non-CSR villages in the evening. Also, young population is migrating to Valung Sambhajinagar MIDC for employment. They are unskilled labourers, getting a minimal salary in MIDC. They cannot even fulfil the basic needs of their family.
- Non-CSR villages have good-quality soil, wells and tub wells, but most farmers cultivate only one crop, especially cotton/maize because of water scarcity from November to June. Most people are available in the villages all the day which means they do not have employment opportunities in their villages.
- Dairy farming and related activities are less common in the village, Only a few farmers sell milk to the dairy. Only a few farmers have hybrid cows. Some farmers have mosambi crops but provide water through tankers in summer. A dam, river, well and tube well are found in these non-CSR villages, but water itself was not there.
- All women involved in the FGD confirmed their participation in joint interest groups, further encouraging collective decision-making and community solidarity. They expressed appreciation for the support provided through RFMC (Revolving Fund Management Committees).

8.3.3 Findings from challenges faced by companies

- The challenges of finding relevant social concerns that coincide with business ideals and community needs make it difficult to balance financial goals and social duties.
- Frequent delays prevail in obtaining necessary permissions, especially in land acquisition for rural projects. The availability of credible NGOs, skilled human resources and medical professionals willing to work in remote areas further complicates implementation. (FICCI, 2016).
- The literature also criticises a significant urban-centric bias in CSR strategy. Rural realities are frequently ignored, leading to culturally insensitive or failing initiatives, as

Khan (2014) and Gupta & Sharma (2016) mentioned. Real-world obstacles to efficient CSR delivery include low stakeholder participation, a lack of fundamental infrastructure and local bodies' inadequate capabilities (Das, 2017; Nair & Munshi, 2019).

- Another recurrent issue is corporate short-termism. According to Bansal & Sharma (2016), the pursuit of quick, reportable results frequently undermines the long-term success of CSR initiatives.
- KPMG (2018) noted that inadequate monitoring and assessment systems increase the discrepancy between reported and real results, especially in remote villages.
- Documentation and permission are the main challenges while implementing CSR activities in adopted villages.
- Lack of social acceptance of CSR spending in the villages prevails. Also, lack of certainty in CSR spending by companies.
- The shortage of trained personnel for the quality of implementation of CSR project.
- Rural local politics is one of the challenges in adopting the villages and implementing CSR activities in the villages. Local politician has their interests at the village level. If local politicians do not seek personal advantages, they actively oppose CSR work. They sowed distrust among villagers or placed demands that diverted resources and attention from genuine development work.

8.4 Policy recommendations

- CSR spending should be in the backward regions.
- The highest CSR spending is concentrated in the education sector, while companies neglect the rest of the sectors. The state government should give proper guidelines to companies so that they can spend according to local needs.
- CSR spending should be more in rural areas because more than 2/3 per cent of the people live in the villages.
- CSR policy should focus on the overall development of villages which can be done through village adoption.
- The contribution of beneficiaries (Lok–Wata) should decrease from 10 per cent to 5 per cent in the village and the company should bear the rest.
- Women employees should work for women's empowerment activities at the village level, which will encourage rural women to take part in these activities, especially training.

- Key issues and need-based approaches should be focused while implementing CSR activities in the villages.
- Proper training should be given to households to manage livelihood activities.
- Group farming should be promoted in a village which would help farmers sell their crops/grains at a higher price.
- JBGVS's CSR should develop a capacity-building programme as crop diversity and production are higher in CSR villages. This will help farmers to mitigate price volatility and manage agricultural risks (Portfolio Management).
- The spending should be large enough for the long-run sustainable development of the villages.
- CSR activities should focus on a specific domain for the long run for sustainable change.
- Companies should focus more on villages from backwards regions to reduce regional disparities.
- The government should focus on soil and water conservation rather than providing irrigation equipment to farmers because water availability is essential.
- Farmers must receive training programmes for water use, soil health, organic farming and dairy production.
- Key issues should be focused in the villages because they help farmers achieve overall growth.
- Livelihood activities such as livestock cannot be successful if enough water is not available at the village level.
- Awareness campaigns and local involvement must be implemented while CSR activities occur.
- Project risk analysis should be done before selecting a village and a project for CSR activity.
- Emphasizing the development and support of the agriculture-processing industry through CSR initiatives. This can include promoting value addition, providing training and resources, and enhancing market linkages for farmers, thereby boosting agricultural productivity and income generation.
- Women from all categories and income groups should be considered for women's empowerment activities in villages. True empowerment is about providing equal opportunities to every woman, regardless of her financial status or background. Women from lower-income groups may require financial assistance and skill development

programs to become self-sufficient. Higher-income women may not require financial support. They can still benefit from leadership development initiatives, training, capacity-building seminars, and mentorship opportunities. Providing the right skills, knowledge, and platform can help them achieve greater independence, take leadership roles, and contribute more actively to their communities. Therefore, an inclusive approach that addresses the specific needs of each group is essential to create a truly empowered and balanced society.

8.5 Scope for future research

- One can look forward to an approach to executing comparative studies between adopted villages by companies and adopted villages by members of parliament. One can also compare the village development by various companies.
- One can look forward to village development vis-à-vis CSR for the different regions.
- For agricultural growth, other than soil and water conservation activities, such as farmer training and women's roles in village development can be studied.
- Future studies can be done on other variables that affect agricultural growth.
- Women's empowerment can be checked using all variables such as economic, political, social, educational and health.

8.6 Contribution of the thesis

This thesis offers valuable insights into how CSR impacts agricultural growth and women's empowerment in the adopted villages. It examines how development occurs in the villages by applying multiple theoretical frameworks on CSR, agricultural growth and women's empowerment. It highlights key variables such as production, productivity, crop diversification, crop intensity and employability in the farm sector, as well as economic, political and social factors in women's empowerment. Beyond academic insights, this research offers practical recommendations to inform makers of policies and programmes to identify significant barriers such as financial constraints, a need-based approach and sustainable village development. The study also emphasises the importance of infrastructure improvements, Soil and water conservation in the villages.

This study focuses on assessing the impact of CSR activities on agricultural growth and women's empowerment. It has given multiple insights for developing the agricultural sector and women's empowerment. It gives valuable insights into community farming, dairy farming and an awareness programme among the villagers about soil and water conservation. The comparison between CSR and non-CSR villages and CSR-MI and CSR-NMI helps capture the

diverse experiences of developing agriculture and women's empowerment, making the findings more relevant to policymakers and local organisations. The insights from this study can help shape policies that promote village adoption for the sustainable development of villages. By addressing economic, social, institutional and political barriers, it contributes to a more holistic approach to village development, ensuring that no variable is left from the contribution to agricultural growth and women's empowerment.

8.7 Conclusion

In short, this study offers a complete basis for future research on the impacts of CSR initiatives on the development of agriculture and the empowerment of women in rural areas by systematically investigating these relationships and rigorous analysis, the research has explained positive associations between irrigation, village adoption, organic farming, and micro-irrigation with crop diversity, crop intensity, production, productivity, income, and employment. CSR activity positively impacted the overall growth of the agriculture sector and women's empowerment in the adopted villages. This study offers a new perspective on village development. By integrating CSR, rural development and women empowerment theories and engaging critically with existing literature, it has been possible to uncover both the strengths and the gaps within current understanding, thereby pushing the boundaries of knowledge in agriculture growth and women empowerment. The study has focused on the dynamics and evolving nature of sustainable agriculture. Showing the adoption of modern technology, soil and water conservation, awareness among farmers, and organic farming has promoted agricultural growth in CSR villages. The study suggests that water conservation and management programs must be implemented in every village, and CSR activities should focus on backward villages. This study acknowledges its limitations, such as that it is based on primary data, data is collected based on respondent responses, and primary data is collected in only six villages. This study has these limitations; however, the findings and suggestions inspire the researcher, government, industry, and NGOs to conduct further research and build a policy for CSR spending in the villages.

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Appendix I

- FIELD SURVEY PHOTOS

Field Survey Photo's – Selected Photos under Records











**“An Impact of Corporate Social Responsibility (CSR)
Activities on Agricultural Growth and Women’s Empowerment in Villages of Chhatrapati
Sambhajinagar (Aurangabad) District in Maharashtra, India”**

This survey is conducted for the purpose of research on “An Impact of Corporate Social Responsibility (CSR) Activities on Agricultural Growth and Women Empowerment in Villages of Chhatrapati Sambhajinagar (Aurangabad) District in Maharashtra, India” by a research scholar of the Gokhale Institute of Politics and Economics (GIPE), Deemed University, Pune 411004. The information obtained in this questionnaire will be used only for research purposes. Personal information provided will be kept confidential. The research team kindly requests that the sample households cooperate in the research by providing accurate information. Your help will be duly acknowledged.

HOUSEHOLD INTERVIEW SCHEDULE

Village		Date	
Taluka		Schedule No.	
Mobile No.		Name of interviewee	

I. Background Information of Respondents:

1. Name : _____

2. Sex : (a) Male (b) Female

2. Age :

3. Marital status : (a) Married (b) Single (c) Divorced (d) Widowed

4 Religion : _____

4.1 Category : (a) General (b) SC (c) ST (d) OBC (e)
Other

5. Type of Family : (a) Joint Family (b) Nuclear Family

6. No. of members working in your family: -----

II Agricultural Development:

1.	Do you own agricultural land?	1. Yes 2. No
2.	How many acre land do you own acr.
3.	Whether agricultural land held by a....	1. Singel owner 2. Jointly
4.	Have you leased in Land?	1. Yes 2. No
4.1	If yes, How many acer?	_____

5.	Do you have water irrigation facility?	1.Yes 2. No							
5.1	If yes, how many acres of the total land area is under irrigation?	Specify							
5.2	What are the sources of water for agriculture irrigation?	1. River 2. Pond 3. Tube-well/ Bore-well 4. Well 5. Tank 6. Canal 7. Other							
5.3	Is this water source sufficient for your agriculture irrigation?	1.Yes 2. No							
5.3.1	If No... What are the reasons?	1. Missed a scheduled watering 2. Faced inadequate water pressure 3. Wrong watering timing 4. Used excessive water 5. Electricity issue. 6. Conflicts among the WUG members 7. Inadequate water availability. 8. Other _____							
6.	How many times do you cultivate your land during a year?	(2016-17)	(2020-21)						
		1-time crop	1-time crop						
		2-time crop	2-time crop						
		3 time crop	3 time crop						
7.	Have you changed crop pattern recently?	1.Yes 2. No							
7.1	If yes/ No from which crop to which crop?	(2016-17)	(2020-21)						
		1.	1.						
		2.	2.						
		3.	3.						
		4.	4.						
		5.	5.						
		6	6						
10.	Do you have livestock?	1.Yes 2. No							
10.1	Specify								
	Livestock (Tick (√) where appropriate)	Local Cow	Cross Breed Cow	Buffalo	Ox	Goat	Sheep	other	Total
	Numbers								

10.2	Have you recently increased a total number of animals? (During 2016-2021)	1. Yes 2. No																																				
11.	Does your annual income through agriculture allied sector increased?	1. Yes 2. No																																				
11.1	If yes, give details.																																					
	<table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Agriculture allied sector</th> <th>Net Annual Income (2020-21)</th> <th>Sold to...</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Dairy farming</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>Goat farming</td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Bee-keeping</td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Poultry farming</td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>Fisheries</td> <td></td> <td></td> </tr> <tr> <td>6</td> <td>Other</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>Total</td> <td></td> <td></td> </tr> </tbody> </table>	Sr. No.	Agriculture allied sector	Net Annual Income (2020-21)	Sold to...	1	Dairy farming			2	Goat farming			3	Bee-keeping			4	Poultry farming			5	Fisheries			6	Other								Total			
Sr. No.	Agriculture allied sector	Net Annual Income (2020-21)	Sold to...																																			
1	Dairy farming																																					
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4	Poultry farming																																					
5	Fisheries																																					
6	Other																																					
	Total																																					
12.	Do you think that the agriculture allied sector decreases the risk of the agricultural sector?	1. Yes 2. No																																				
13.	Has your net annual income increased in the last five years?	1. Yes 2. No																																				
14	Please give details of Net Annual Income (Agriculture + Agriculture Allied+ Other)	<table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Year</th> <th>Net Annual Income (in Rs)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2020-21</td> <td></td> </tr> </tbody> </table>	Sr. No.	Year	Net Annual Income (in Rs)	1	2020-21																															
Sr. No.	Year	Net Annual Income (in Rs)																																				
1	2020-21																																					
15.	What has been your most consistent crop from the last 4-5 years? (2016-2021) in terms of making a good profit?																																				

19.	Do you get sufficient food grain for your consumption from your agricultural production?	1. Yes 2. No
20.	Do you think recent CSR activity being done in your village is helping to get self-sufficiency in food grain?	1. Yes 2. No
20.1	If no, what is the reason behind insufficiency in crop production?	
21.	Do you know the agri-related govt. Schemes?	1. Yes 2. No
21.1	If Yes, Enlist the names	1. State Agriculture Mechanization Scheme 2. Pradhan Mantri Kisan Samman Nidhi. 3. Pradhan Mantri Krishi Sinchayee Yojana 4. Crop Insurance Scheme 5. Maharashtra Farm Loan Waiver Scheme 6. Micro irrigation scheme 7. Live Stock Insurance Scheme 8.....

		9.....																				
21.2	Do you know how to access the agri-related Government Scheme?	1. Yes 2. No																				
21.3	If Yes, How do you come to know about govt. Agri schemes?	1. Company 2. Friends 3. Neighbour 4. SHGs 5. VDCs 6. Talathi 7. Krushi Sevak 8. Other.....																				
21.4	Have you availed of any government scheme?	1. Yes 2. No																				
21.5	If Yes, Enlist the names	1. 2. 3. 4.																				
22.	Do you know how to use different agriculture technology?	1. Yes 2. No																				
22.1	If Yes, Give details.																					
	<table border="1"> <thead> <tr> <th>Sr. No.</th> <th>Water Use Technology</th> <th>Cultivation</th> <th>Production</th> <th>Marketing</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Sr. No.	Water Use Technology	Cultivation	Production	Marketing	1					2										
Sr. No.	Water Use Technology	Cultivation	Production	Marketing																		
1																						
2																						
23.	Do you know anything about sustainable agriculture?	1. Yes 2. No																				
24.	Have you taken any steps to make your farm more environment friendly?	1. Yes 2. No																				
24.1	If Yes, give details.																					
29.	Have you done soil testing on your agricultural land?	1. Yes 2. No																				
29.1	How do you come to know the importance of soil testing? (Tick (√) where appropriate)	1. Company 2. Friends 3. Neighbour 4. SHGs 5. VDCs 6. Talathi 7. Krushi Sevak 8. Other.....																				
29.2	Has production cost decreased due to soil testing and methods of organic farming?	1. Yes 2. No																				
29.3	Has productivity increased due to soil testing and the method of organic farming?	1. Yes 2. No																				
29.4	Has demand for vegetables and food grain increased due to organic farming?	1. Yes 2. No																				

31. What are the recent crucial problems in agriculture?

(a).....

(b).....

32. Occupations/ Livelihoods of the households/Annual Family Income (2020-21):

Sr. No.	Sectors		Gross Annual Income (2020-21) (In Rs.)	Net Annual Income (2020-21) (In Rs.)
1	Agriculture sector	1. Agriculture Cultivator		
		2. Agriculture Labour		
2	Agriculture allied sector	3. Dairy farming		
		4. Goat farming/ Sheep		
		5. Beekeeping		
		6. Poultry farming		
		7. Fisheries		
		8. Other.....		
3	Non-agriculture sector	9. Business/ Trade		
		10. Govt. employee/ Salary		
		11. Pvt. Salaried employee		
		12. Non-agriculture labour		
		13. Daily Wage labourer		
		14. Other.....		
	Total			

III. Family Details: ss

Sr. No.	Name	Gender	Age	Education	Occupation	Source of Income	Member of organisation/ committee	No. of days working for money in a month	Annual Income (2020-21) (In Rs.)
1.									
2.									
3.									
4.									

5.										
	Total									

III. Information about production, Productivity, Crop, Irrigation, technology, fertiliser, pesticides etc

III		Information about production, Productivity, Crop, Irrigation, technology, fertiliser, pesticides, etc														
8.		What do you grow on the farm?														
9.		Do you think agricultural productivity per acre has increased?														
9.1		If Yes, How much quintal per acer? (Average)														
16.		Do you use family labour?														
16.1		If yes, please provide details of the family labour.														
17.		Did you hire any labour to assist with farming?														
17.1		If so, please provide details about the labourer.														
18.		Do you hire labourers to farm out of your villages?														
18.1		If yes. How many days annually?														
25.		Do you use fertiliser for agricultural production?														
26.		Do you use pesticides for agricultural production?														
27.		Do you use organic pesticides?														
28.		Do you use organic fertiliser?														
30.		Have you adopted modern water-saving technologies such as sprinklers and a drip irrigation system?														
Particulars Status in (2020-21)	A r e a i n a c r e s	I r r i g a t e d	w a t e r - s a v i n g t e c h n o l o g i e s	P r o d u c t i o n I n q u i n t a l	P r o d u c t i v i t y p e r a c r e (i n Q .) (2 0 - 2 1)	P r o d u c t i v i t y p e r a c r e (i n Q .) (2 0 - 1 6 - 1 7)	R e c e i v e d P r i c e P e r Q u i n t a l	S o l d d o ..	F a m i l y L a b o r (I n D a y) (I n D a y) (M F)	L a b o r (I n D a y) (M F)	W a g e R a t e P e r D a y (i n R s)	F e r t i l i s e r u s e p e r a c e r C o s t (i n R s) (O N - O)	P e s t i c i d e u s e p e r a c r e c o s t (O N - O)	T o t a l P r o d u c t i o n C o s t (i n R s)		
A	Kharif Season Crops								P	D	P	D				
1																
2																

3																
.																
4																
.																
5																
.																
B	Rabbi Season Crops								P	D	P	D				
.																
1																
.																
2																
.																
3																
.																
4																
.																
5																
.																
C	Summer Season Crops															
.																
1																
.																
2																
.																
3																
.																
D	Annual Crops															
.																
1																
.																
2																
.																
	Total															

(M= Male F= Female) (O= Organic N-O= Nonorganic) (Production Sold to Code: 1=Commission Agent 2= APMC 3= Processor (Sugar Factory , Cotton processing, 4=) Village Market 5= Other Specify.....) P= Person D= Day

Appendix III



**Gokhale Institute
of Politics and
Economics**
(Deemed to be University)

Ph.D. Programme in Economics

“An Impact of Corporate Social Responsibility (CSR) Activities on Agricultural Growth and Women Empowerment in Villages of Chhatrapati Sambhajinagar (Aurangabad) District in Maharashtra, India”

This survey is conducted for the purpose of research on “*An Impact of Corporate Social Responsibility (CSR) Activities on Agricultural Growth and Women Empowerment in Villages of Chhatrapati Sambhajinagar (Aurangabad) District in Maharashtra, India*” by the Gokhale Institute of Politics and Economics (GIPE), Deemed University, Pune 411004. The information obtained in this questionnaire will be used only for research purposes. Personal information provided will be kept confidential. The research team kindly requests the sample households to cooperate in the research by providing accurate information. Your help will be duly acknowledged.

HOUSEHOLD INTERVIEW SCHEDULE

Village		Date	
Taluka		Schedule No.	
Mobile No.		Name of interviewee	

I. Background Information of Respondents:

1. Name

: _____

2. Sex : (a) Male (b) Female

2. Age :

3. Marital status : (a) Married (b) Single (c) Divorced (d) Widowed

4 Religion : _____

4.1 Category : (a) General (b) SC (c) ST (d) OBC (e) Other

5. Type of Family : (a) Joint Family (b) Nuclear Family

6. No. of members working in your family: -----

II. Livelihood (2020-21)

1	Name of Livelihood Activity: _____		
2	Do you use family labour?	1. Yes	2. No
3	Did you hire any labour to assist?	1. Yes	2. No
i.	Details:		

	Particulars	Family Labour (In Days)	Outside Labour (In Days)	Wage Rate Per Day (in Rs.)
	Male			
	Female			
	Child			
	Total			
4	Have employment opportunities for you increased recently?		1. Yes 2. No	
i.	If yes, how many days of employment in a year do you get?	Before (in 2016-17)		After (in 2020-21)
5	Has your net annual income increased in the last five years?		1. Yes 2. No	
i.	If yes, please give details of net Income (Agriculture + Agriculture Allied+ Other)	Sr. No.	Year	Net Annual Income (in Rs)
		1.	2020-21	
6	What amount did the entire household or household members earn during the past 12 months from this activity?		
7	Do you agree that various CSR activities/programs conducted/ this livelihood activity helped your personality improve?		1. Yes 2. No	
i.	If agree.			
	<i>(Tick (√) where appropriate)</i>	1. Completely	2. partially	3. Neutral
	Confidence level increased			
	Developed Entrepreneurship			
	Skill developed			
	Knowledge gain			
	Knowledge of banking procedures			
	Financial literacy			
	Mobility increased			
8	Which livelihood opportunities have been opened in the village in the last 5 years?			

II. Women's Empowerment through Livelihood Activity:

1.	Do you have bank account?	1. Yes 2. No
i.	If yes, when did you open your account?	
ii.	Do you maintain a minimum balance in your account?	1. Yes 2. No
iii.	How often do you withdraw money from your bank account?	
iv.	Are you aware of net-banking?	1. Yes 2. No
2.	Have you ever borrowed money or taken out a loan independently?	1. Yes 2. No

i.	If yes, up to what amount have you borrowed/taken a loan?	
ii.	Who decided to borrow/what to do with the money?	1.Me 2. My spouse 3. Someone else 4.Me&My spouse 5.I don't know
iii.	What are all the places that you have ever borrowed money or taken out a loan from?	0. Money Lender 1. Government Bank 2. Private Bank 3. Co-operative Bank 4. SHGS 5. JBGVS 6. Trader 7. Agro-processors 8. Parents 9. Relatives 10. Friends 11. Other
iv.	For which of the following purposes have you taken a loan from this lender?	1. Agriculture 2. Business 3. Household Expenditure 4. Marriage 5. Festivals 6. Health 7. Education 8. Other-----Specify
v	Did you get sufficient loan for your business/livelihood activity?	1. Yes 2. No
vi.	Do you get a loan from the bank/SHG whenever needed?	1. Yes 2. No
3.	Do you or have separate savings?	1. Yes 2. No
i	If yes, where do you save your money?	1. Cash 2. Bank 3.SHGs 4. Post office 5. Give it to mother/ father 6. Relatives 7. Friends 8. Buy jewellery 9. Insurance 10. Mobile banking 11. Other.....
ii.	Who makes decisions in your household about saving?	1.Me 2. My spouse 3. Someone else 4.Me&My spouse 5. I don't know
4.	Have your savings increased recently?	1. Yes 2. No
i.	If yes, give details.	

		Sr. No	Financial Year	Annual savings in Rs.
			2016-17	
			2017-18	
			2018-19	
			2019-20	
			2020-21	
ii.	If yes, what is the reason behind the increase in savings?			
5.	Do you have a phone?	1. Yes	2. No	
i.	If Yes ..	1. Own phone 2. Family phone 3. Smartphone 4. Simple phone		
7.	Who makes decisions in your household about how to spend money?	1.Me 2. My spouse 3. Someone else 4.Me&My spouse 5. I don't know		
8.	Do you have legal ownership of your home?	1. Yes	2. No	
i.	If Yes	1. Individual house ownership 2. Joint house ownership		
9.	Do you have legal ownership of your agricultural land?	1. Yes	2. No	
i.	If Yes	1. Individual agricultural land ownership 2. Joint agricultural land ownership		
10	Who decides for your household about sell of house/ land or purchase of a house/land?	1.Me 2. My spouse 3. Someone else 4.Me&My spouse 5. I don't know		
11	Are you permitted to visit any place riding on public transport?	1. Yes, alone does not need permission 2. Yes, alone, with permission 3. Yes, but never alone 4. Yes, alone does not need permission		
12	Are you permitted to visit any place in a private vehicle?	1. Yes, alone does not need permission 2. Yes, alone, with permission 3. Yes, but never alone 4. Yes, alone do not need permission		
13	Are you allowed to go alone to meet your friend or neighbours?	1. Yes	2. No	
14	Do you go to the market alone within your village and the nearest market?	1. Yes	2. No	
15	Do you attend any community events/ activities in the village? Ex. Cultural programme, theatre, religious event	1. Yes	2. No	
16	Do you participate in any sort of community events/ activities in the village? Ex. Cultural programme, theatre, religious event	1. Yes	2. No	

17	Do you think your social status in society has improved nowadays?	1. Very high 2. High 3. Neutral 4. Low 5. No
18	Do you think your social status at home has improved nowadays?	1. Very high 2. High 3. Neutral 4. Low 5. No
19	Has your financial Credibility improved in the village	1. Yes 2. No
20	Are you member of any group/ committee?	1. Yes 2. No
i.	If yes, which groups/committee?	1. SHG 2. Village Committee 3. Water use committee 4. Mahila Mandal 5. Tantamukti Samiti 6. School Management Committee 7. Welfare committee 8. Other-----
21	Are you head of any group/ committee?	1. Yes 2. No
i.	If yes, which groups/committee?	1. SHG 2. Village Committee 3. Water use committee 4. Mahila Mandal 5. Tantamukti Samiti 6. School Management Committee 7. Welfare committee 8. Other-----
22	Do you attend meeting of group frequently?	1. Yes 2. No
i.	If Yes, frequency of meetings	1. Quarterly 2. Monthly 3. Biannually 4. Annually
23	Have you ever attended the gram Sabha?	1. Yes 2. No
i.	If Yes, When was the last meeting you attended?	
24	Do you Interact with local political leaders in the village? (Sarpanch, MLA, Panchayat Samiti member, Z.P. member etc.)	1. Yes 2. No
i.	If Yes, what are the reasons?	
25	Are you aware about political parties?	1. Yes 2. No
26	Have you ever participate in discussion about women issue?	1. Yes 2. No
i.	If Yes, What was the issue?	

27	If needed ,Do you Interact with government officials and representatives ?	
i.	If Yes, what are the reasons?	
28	Are you agree with due to various CSR activities/programs conducted helped in your personal improvement?	1.Yes 2. No
i.	If agree. <i>(Tick (√) where appropriate)</i>	1. Completely 2. partially 3. Neutral 4. No
	Confidence level increased	
	Got Motivation	
	Skill developed	
	Knowledge gain	
	Knowledge of banking procedures	
	Financial literacy	
	Mobility increased	
29	What level of education would you like your daughter to achieve?	
30	What level of education would you like your son to achieve?	
31	Does your son attend school on regular basis?	1.Yes 2. No
32	Does your daughter attend school on regular basis?	1.Yes 2. No
i.	If no, What is reason	1.No school after 7 th std. in village 2.No Money 3.Security 4.Household work 5.School/ college is too far 6.Other.....

7. Family Details:

Sr. No	Name	Gender	Age	Education	Occupation	Source of Income	Member of the organisation/ committee	No. of days working for money in a month	Annual Income in Rs. (2020-21)
1.									
2.									
	Total								

33. Occupations/ Livelihoods of the households/Annual Family Income (2020-21):

Sr. No.	Sectors		Employment of women (No. of Days)	Wage Rate per day(In Rs.)	Gross Annual Income (2020-21) (In Rs.)	Net Annual Income (2020-21) (In Rs.)
1	Agriculture sector	1. Agriculture Cultivator				
		2. Agriculture Labour				
2	Agriculture allied sector	3. Dairy farming				
		4. Goat farming/ Sheep				
		5. Beekeeping				
		6. Poultry farming				
		7. Fisheries				
		8. Other.....				
3	Non-agriculture sector	9. Business/ Trade				
		10. Govt. Employee/ Salary				
		11. Pvt. Salaried employee				
		12. Non-agriculture labour				
		13. Daily Wage labourer				
		14. Other.....				
	Total					