



An e - Magazine

Krishaka Devo Bhava

Let Farmers Be Your God



कृषकदेवो भवः !

*Ramakrishna Mission Vivekananda Educational and Research Institute
(RKMVERI)*

NAAC Accredited (A++ Grade)

School of Agriculture and Rural Development

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About

Krishaka Devo Bhava (KDB) is an e-magazine, highlighting rural issues, published by Ramakrishna Mission Vivekananda Educational and Research Institute (RKMVERI), Ranchi Centre. The first issue of the e-magazine was published on the historic occasion of Swami Vivekananda's 150th birth anniversary celebration and during the international year, 2014, of family farming. Let us add the slogan *Krishaka Devo Bhava* to the traditional ancient exhortations and Swami Vivekananda's own exhortation of *Murkha Devo Bhava*, *Daridra Devo Bhava* and struggle to live up to this new exhortation in letter and spirit. This open access and free e-magazine accepts theoretical and conceptual articles as well as empirical and review papers in different areas of agriculture, rural and tribal issues. The magazine occasionally publishes special and contemporary issues that explore a single topic. It also publishes, research notes, creative writing, personal field experience, scholarly comments and reviews of books. Published in three issues per year, January, April and October, coincide with the birth anniversary of Swami Vivekananda, Rabindranath Tagore and Mahatma Gandhi, respectively.

Foreword

The most recent issue of *Krishaka Devo Bhava* (KDB), the e-magazine devoted to illuminating the rural landscape and addressing the fundamental issues that shape the lives of countless individuals across our nation, is presented to you on this auspicious occasion of Mahatma Gandhi's Birth Anniversary with great pleasure and pride. Since its start, KDB, which is published by the Ramakrishna Mission Vivekananda Educational and Research Institute (RKMVERI), Ranchi Campus, has traveled on a wonderful journey. We distribute our publications three times a year in January, April, and October to coincide with the birthdays of historical figures that have had a profound impact on our country. Swami Vivekananda, Rabindranath Tagore, and Mahatma Gandhi, each of them a guiding light in their own right, inspire us to strive for a better, more compassionate, and equitable society.

We honor Mahatma Gandhi's persistent dedication to the truth, nonviolence, and the advancement of the weak in this issue, which is devoted to his memory. It is our uprightness to honor him through the pages of KDB since his vision and deeds have left an enduring legacy.

Our beloved Father of the Nation or known as *Bapuji*, Mahatma Gandhi, was more than just a political figure; he was a living example of profound philosophy and vision. We at *Krishaka Devo Bhava* (KDB) continue to follow his rural development ideology as we dedicate this issue to his memory. Gandhiji thought that empowering those who were socially and economically marginalized was the only way to achieve meaningful change. He fervently promoted rural development, contending that India's villages held the country's spirit. His strategy, which is based on independence, simplicity, and nonviolence, is the cornerstone of his philosophy. The benefit of everyone, or "Sarvodaya," was at the heart of Gandhiji's ideology. Even the most isolated rural residents would have access to the necessities of life in the society he imagined.

This is very consistent with KDB's objective, which is to raise the status of those frequently left behind by development and shed light on rural challenges. Gandhi promoted local crafts, agriculture, and manufacturing not only for economic sustainability but also to uphold the dignity of work.

He promoted "*Swadeshi*," or self-reliance, encouraging communities to produce what they consume in order to lessen their reliance on outside resources. He emphasized that our efforts should be grounded in compassion and understanding and that non-violence might change people's hearts and minds. Gandhiji's unrelenting dedication to justice, equality, and the truth acts as a moral compass. He argued that social justice and rural development couldn't coexist, and he used his battles against caste and untouchability-based discrimination as an example.

Let's keep Gandhiji's teachings in mind as we navigate rural concerns and browse KDB's pages. His legacy encourages us to act as agents of good, to work for the benefit of all, and to promote just and sustainable rural communities. By examining rural development from a variety of perspectives in this issue, we wish to pay tribute to Mahatma Gandhi by being inspired by his life and ideas. Join us on the journey to achieving Gandhiji's goal of a more inclusive and peaceful society by immersing yourself in the rich tapestry of rural India.

Let us be reminded that even the simplest deeds of generosity, compassion, and service have the power to positively impact our society. Think about how you, too, can support the rural development Gandhiji valued, whether by your own actions, your activism, or your understanding, as you read.

Let us rekindle our respect for the farmers and rural people who keep our country's soul alive in the spirit of "*Krishaka Devo Bhava*." Let their challenges and victories motivate you to show your support for one another and try to create a more just and peaceful society.

Dated: 26.09.2023

Yours in the service of God

Swami Bhaveshananda

Administrative Head
RKMEVRI, Ranchi

Information for Contributions

Articles for scientific section should preferably be between 1000-3000 words. Scientific papers written in clear, concise and correct English will be considered for publication. Acceptance of articles is based on the content of the original data or interpretation of the material. The editors reserve the right to edit manuscripts to ensure conciseness, clarity and stylistic consistency.

Manuscript: An electronic version as a Microsoft Word Document is preferred. The manuscript should be typed in double-spacing. References should be arranged alphabetically. The reference list should include all articles cited in the text and tables. Manuscripts should be submitted to the Managing Editor(s), KDB, e-magazine through email: **kdbranchi@gmail.com**.

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Causes of School Dropout among Rural Children in Ranchi, Jharkhand: Critical Insights

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Introduction

India's educational system, which it inherited at the time of its independence in 1947, was not only quantitatively small but also marked by significant regional, ethical and structural inequalities. One child out of every three was enrolled in primary school, and only a very small portion of the population was literate. Acute regional and gender inequalities added to the enrolment rates and literacy levels. Recognizing the importance of education in the process of personality development, the state felt it was crucial to reform and restructure the educational system. As a result, the Indian constitution as well as subsequent five-year plans offered a clearly defined and delineated structure for universal education for all children between the ages of 6 and 14. Despite this free and compulsory education system children are leaving school between the ages of 6 to 14. Dropout is very big problem in our country as well as in Jharkhand. As we know that development of any nation is depend on the education and qualification of that particular nation. In this study we have found so many reasons why students are being dropped out from school. One of the objectives of the Indian freedom movement was basic education, and even Mahatma Gandhi, who led the epic struggle against colonial rule, came up with a substitute. In various provisions of the Indian Constitution, the community-based educational system, which has its roots in the fight for independence, is emphasized along with the general guiding principles for the country's educational growth. The constitution carefully divides up the legislative, administrative, and budgetary responsibilities between the union government and the state governments. Article 45 of the constitution states that "the state shall endeavour to provide within a period of ten years from the commencement of this constitution, free and compulsory education for all children until they complete the age of fourteen years. "Article 12 of the constitution defines the expenditure that occurs in this field, which includes union government, legislature of each state government, and other local authorities.

It was included to the concurrent list only after the 42nd Amendment to the Indian Constitution. Except for a few specific items on the union list related to the setting of standards in institutions for higher learning or research, education was otherwise included in the state list. The creation and upkeep of central universities and specific institutions for scientific or technical research and education. The inclusion of education in the concurrent list was done to make it easier to evaluate the educational policy of the old India. However, this gave the parliament the right to pass laws pertaining to education. Even so, Centre has been supporting educational advancement through a mutually agreed-upon procedure. The National Policy in education (NPE) 1986 gave the concept of concurrency an operational definition. With regard to the national and integrative character of educational quality in terms of skill manpower planning, research in advanced studies at an international level, and aspects of culture as well as human

resource development, this policy views concurrency as “meaningful partnership between the Centre and the States”. It also places a greater responsibility on the union government.

Education across time:

In India, education has a rich and interesting history. From roughly the first century B.C. to 1200 A.D., the Vedic, Post-Vedic, Buddhist, and Jain systems of education covered the ancient Indian education. The research demonstrates that scholars and experts transmitted knowledge verbally in the past, but that with the invention of writing, education took the form of writing on palm leaves and tree bark which promoted written literature. Schools were substituted with temples, ashrams and community centers.

Education System in India:

Up until 1976, each of India’s constitutional states set legal guidelines for how education policy should be implemented. Education became a “concurrent subject” in 1976 when the 42nd amendment to the constitution took effect. From that moment forward, the formal funding and management of education came under the formal joint jurisdiction of the federal and state governments. This means that there is large amount of opportunity for diversity across states in the policies, plans, programs and initiatives for elementary education in a country as big as India, which currently has 28 states and 8 union territories.

Education Policy 2020:

Lowering dropout rates and ensuring that all students have access to all levels of schooling—Ensuring that students are enrolled in and attending school must be one of the main objectives of the educational system. With the help of programmes like the Right to Education Act and the Sarva Shiksha Abhiyan (now known as Samagra Shiksha), India has made significant progress in recent years toward achieving almost universal enrolment in elementary school. The results for later grades, however, point to some significant problems with keeping students in the educational system. The GER for Grades 6–8 was 90.9%, whereas it was only 79.3% and 56.5% for Grades 9–10 and 11–12, respectively, showing that a sizable fraction of enrolled students drop-out after Grade 5, and especially after Grade 8. 3.22 crore children in the age range of 6 to 17 years are not enrolled in school, according to the NSSO's 75th round household survey conducted in 2017–18. To attain a 100% gross enrolment ratio from preschool to secondary level by 2030, it will be of utmost importance to reintegrate these children into the educational system as soon as possible and stop more students from quitting. All children in the nation will have access to quality, comprehensive education from preschool to grade 12, including opportunities for vocational education, thanks to a coordinated national effort to accomplish this.

According to **Pratham** NGO “School Dropout Rate is higher than before in Jharkhand”: The 10th Annual Status of Education Report (ASER) 2014, a survey by Pratham, an NGO, reports that this year, more children in the state's rural districts do not attend school than in the years prior.

The dropout rate is higher among older children, according to the report, which was released in New Delhi. 4.3% of children between the ages of 6 and 14 were either not enrolled in school or had dropped out in 2014, according to the study. Children who missed school decreased

from 4.4% in 2012 to 3.8% in 2013. Similar to this, 6.7% of students aged 7 to 16 dropped out of school in 2014. This percentage was only 6% in 2013. In 2014, there were 3.4% of 7- to 10-year-old children and 9% of 11- to 15-year-old children who were not enrolled in school.

In 2014, 19.95% of children between the ages of 15 and 16 were not enrolled in school. Girls are more likely than boys to drop out of school in the 7–10 age range, with 3.5% of girls dropping out compared to 3.4% of boys. In the age group of 11 to 14, boys made up 5.7% of the population and girls made up 6.0%. Nevertheless, in 2014, 17.6% of girls and 22% of boys in the 15–16-year-old age range were not attending school.

Trends in education across time: Are students staying in school?

ASER teams made multiple attempts in 2020 and 2021 to investigate what was happening with children's schooling during the pandemic. In 2020 and 2021, two nationally representative surveys were conducted in 2021 in three main Indian states. These data give a preliminary look at changes in enrolment during the pandemic. Just before the second wave of the pandemic, in February 2021, the first one was carried out in Karnataka. According to data from Karnataka, enrolment in government schools for students aged 6 to 14 increased from 69.9% in 2018 to 72.6% in 2021. In October and November of 2021, Chhattisgarh conducted the second field survey. The enrolment at government schools increased significantly in this area as well, rising from 76.4% in 2018 to 82.9% in 2021. Similar trends are seen in the third field survey from West Bengal, which was conducted in December 2021; enrolment in government schools increased from 88.1% in September-October 2020 to 91.5% in December 2021. Despite the closure of schools, the percentage of students (ages 6 to 14) who were not enrolled decreased from 2% in 2018 to 1% in 2021. The most recent national ASER rural field survey before Covid was carried out in 2018. In India as a whole, the enrolment rate for students aged 6 to 14 was 97.2% that year. The figures from 2022 indicate that this percentage has risen to 98.4%.

Objective

1. To determine the reasons why rural children, leave school.
2. To understand the effects of rural children dropping out of school.
3. To analyze the dropout problem's cause with a focus on caste and gender specific dropouts.

Methodology

The researcher used both quantitative and qualitative methodologies in this investigation. To determine the percentage, quantitative data is used. The percentage is then shown using tables and graphs. A tool like a schedule was used by the researcher to collect the quantitative data. In order to gather information from the core targets, namely the dropout children, a self-prepared interview tool was used. The interview schedule was created after extensive consultation with the professionals, academicians, researchers and authors of several research papers who are involved in the creation and execution of programmes and projects aimed at helping school dropout children. The interview questions are divided into three sections: the first section asks the dropout children about their socioeconomic status; the second section asks about the reasons or circumstances that led to their dropping out of school; and the third section

asks about the effects that their dropping out of school had on their lives.

Population size

The universe or population is the totality or aggregate of all situations that meet a particular set of requirements (Ahuja,2015). The population is the big group from which a sample is drawn for any research effort. The population consists of all potential subunits or components that can form a big group. Therefore, the population consists of all individuals, creatures or things that share at least one trait. The population of this study was comprised of high school dropouts under the age of 20, including male and female resident of 4 blocks in Ranchi district of Jharkhand.

Sample size

A sample is a limited, controllable representation of a larger group. It has a sub-population of containing traits. When population sizes are too big for the test to include all potential participants or observations, samples are utilised in statistical testing. A sample should be representative of the population as a whole and should not show bias toward any particular characteristic. The term “sample” refers to the selected part that is utilised to discover the qualities of the broader group. As an alternative, a sample is a subset or representative sample of a larger group. It may be appropriately referred to as a symbol of the greater whole. The researcher used 400 respondents as the sample size for this investigation. The responders were selected from Angara, Burmu, Mandar and Tamar block of Ranchi district.

Sample Technique

Probability and non-probability are the fundamental categories used to divide sampling. In contrast to non-probability sampling, which makes no claim to be representative of the population being studied and so limits the generalizability of results, probability sampling refers to sampling in which each unit of the population has an equal chance of being picked for research. Typically, it is employed in exploratory research (Patel and Dubey).

The sampling method known as non-probability sampling involves selecting the subjects or components not at random. Therefore, it is unknown and impossible to estimate the possibility that any specific component of the population will be chosen.

Contrarily, probability sampling is a method in which each element unit in the sampling frame has a separate, equal chance of being selected for the sample. In this method, the choice of the elements or units is randomly selected, maybe tossing a coin or pulling a number out of a bucket. Random selection is the name given to this method of choosing components or units (Pathak, 2008: p46). Purposive sampling was used by the researcher since it allows for the selection of the study topic’s sample. A nonprobability sampling method called “purposeful sampling” enables the researcher to choose certain sampling units that may accurately reflect the population. Purposive sampling refers to sampling where constraints are placed on an element’s potential inclusion in the sample (*Pathak, 2008: p55*).

Data Collection

The researcher visited individually to the house of all 400 respondents. The researcher collected relevant quantitative data from 400 high school drop-out children in Ranchi covering eight villages of the Angara, Burmu, Mandar and Tamar block. In order to collect qualitative data, the researcher conducted Case Study of two drop-out children.

Data Analysis

SPSS (Statistical Package for Social Sciences) as well excel was used to enter and analyse the acquired data. It has been examined using straightforward statistical approaches. The analysed data was tabulated and qualitatively evaluated to give the villages' distinct characteristics. To provide an effective result, triangulation method was used to compile both qualitative and quantitative data.

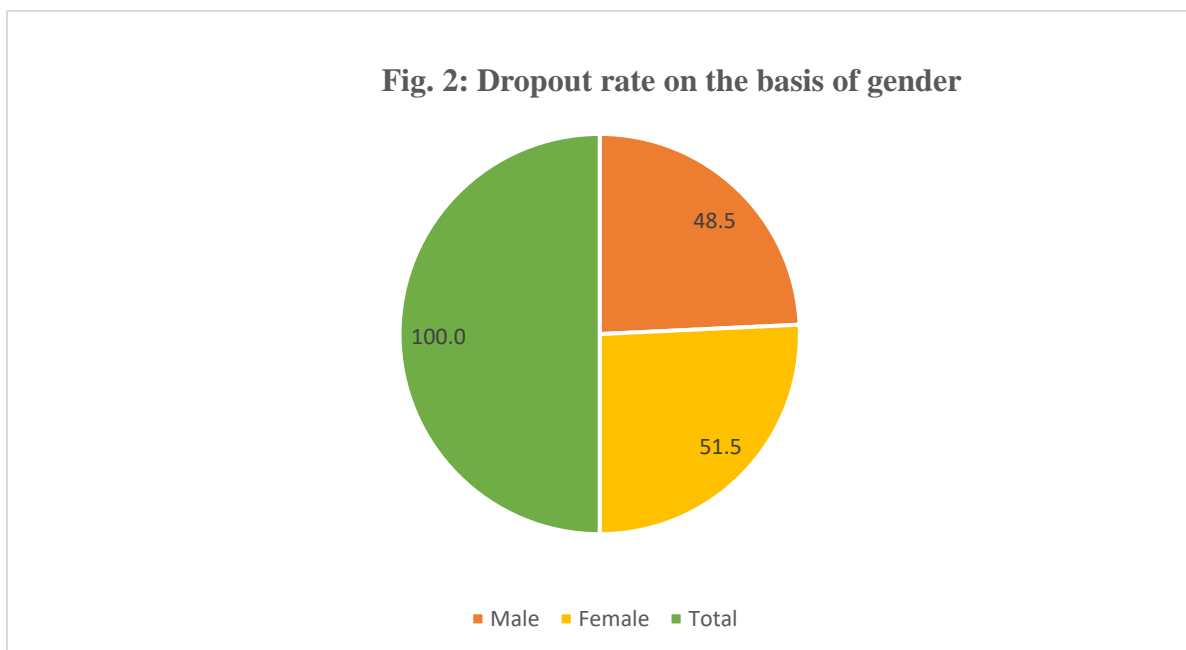
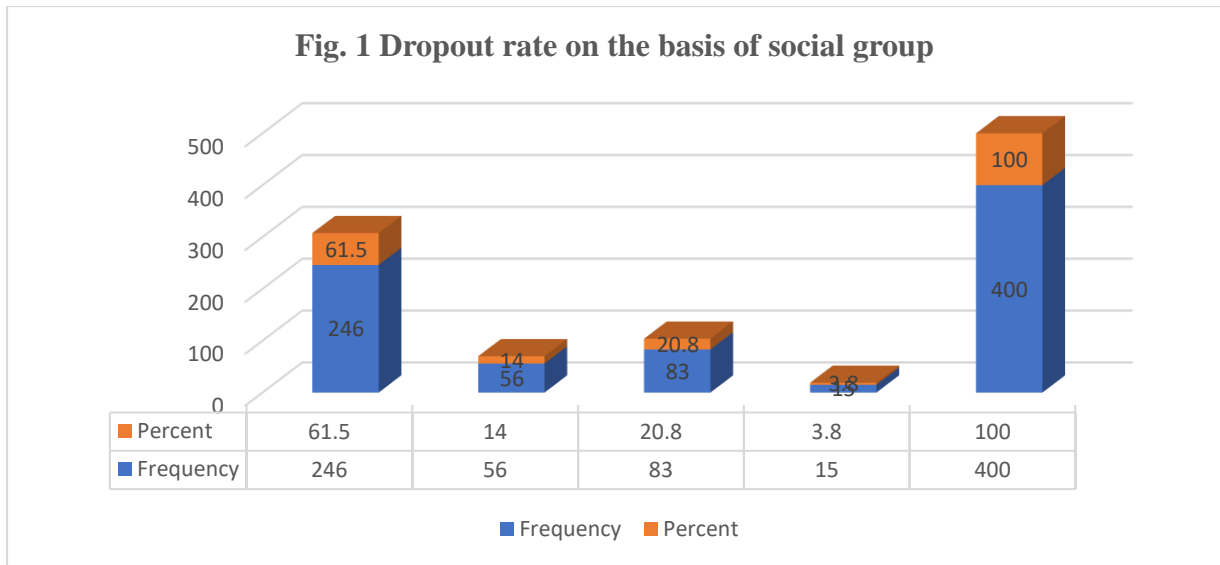
Table-1 Causes of children's dropout

Causes	Frequency	Percent
Failed in exam	8	2.0
Child marriage	2	0.5
Peer group	1	0.3
Parents and family	10	2.5
Financial Problem	48	12.0
Ill health	8	2.0
Household or farm work	1	0.3
Migration	29	7.3
Lack of interest	43	10.8
Lockdown effect	76	19.0
wanted to earn money	1	0.3
Poor quality education	4	1.0
Lack of smartphone during lockdown	164	41.0
Others	5	1.3
Total	400	100.0

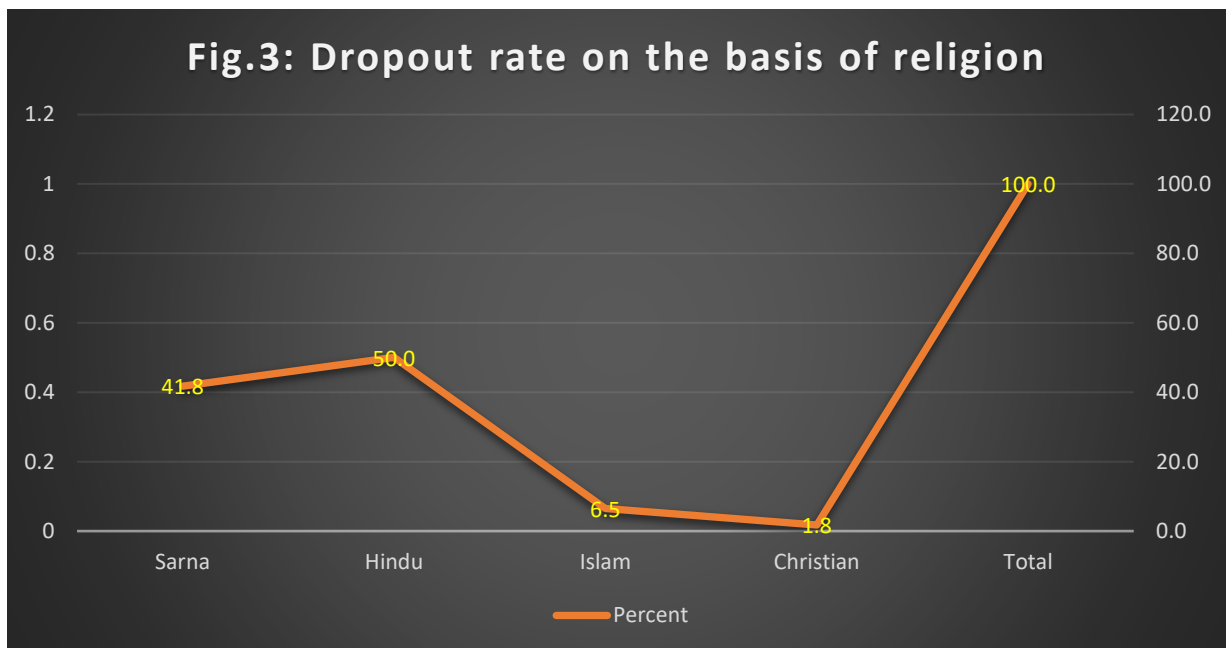
Above table shows that highest number of student dropout is found due to the problem of lack of smartphone during lockdown period. It was seen that students were doing their classes through virtual mode during lockdown but they had no mobile phone to join the classes. Due to lack of mobile phone and data pack they couldn't join the classes because of which they have been dropped out from school. Second reason of dropout is also the effect of lockdown it means when lockdown started in the state all schools were closed fully. Then some students left their school and they are 19%. Financial problem, Lack of interest, Migration, Parents and Family, failed in exam are some important factors of dropout which make them to have dropped out from school.

In this table the data reveals that highest number of dropout children are found in the social group of Scheduled Tribe (ST). There are 246 children from Scheduled Caste, 83 children from

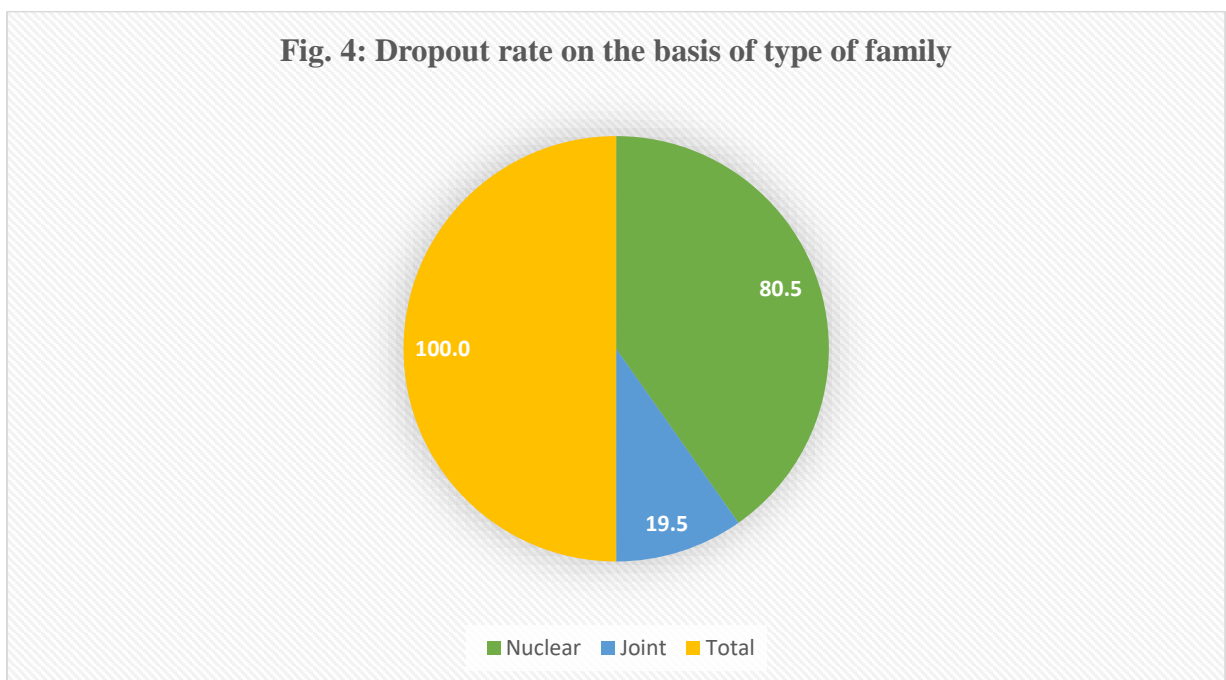
Other Backward Class, 56 children from Scheduled Caste and only 15 children were found from general category who were dropout from school.



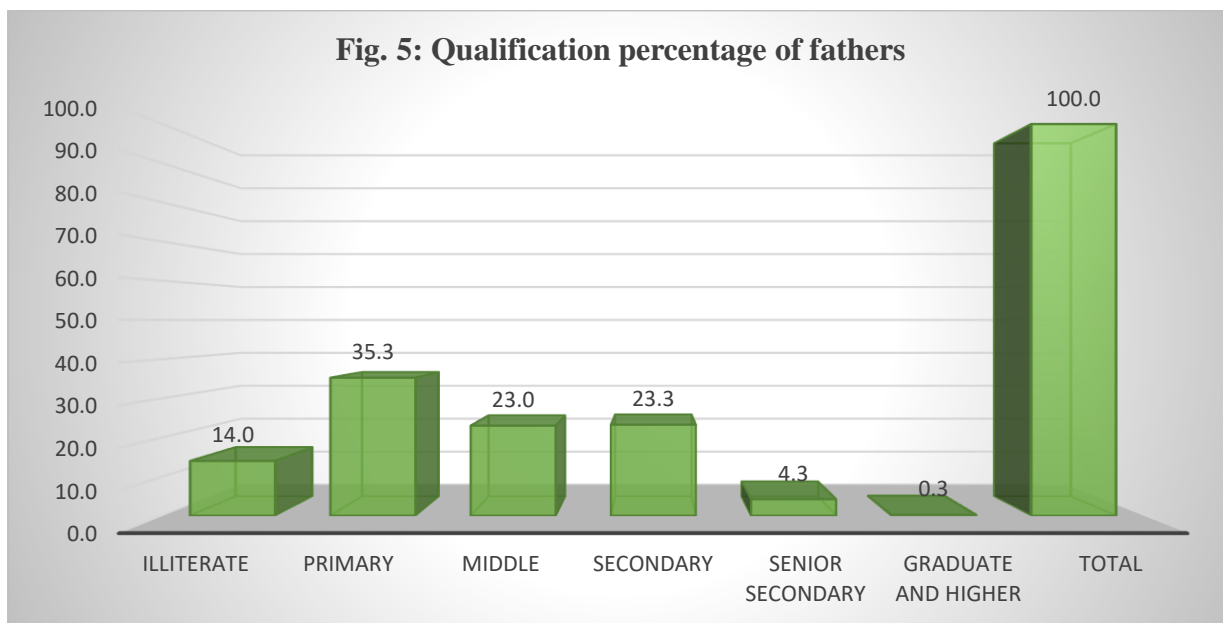
Above graph reveals that female children are more dropout than male children i.e., 51.5% children are male and 48.5% children are female. It's due to female children are being involved in the household work with their parents. Child marriage is also a reason among female children why they are being dropout. In rural society girl children are not given priority in teaching while boy children are given priority because they think that male children are bread earner of that particular family.



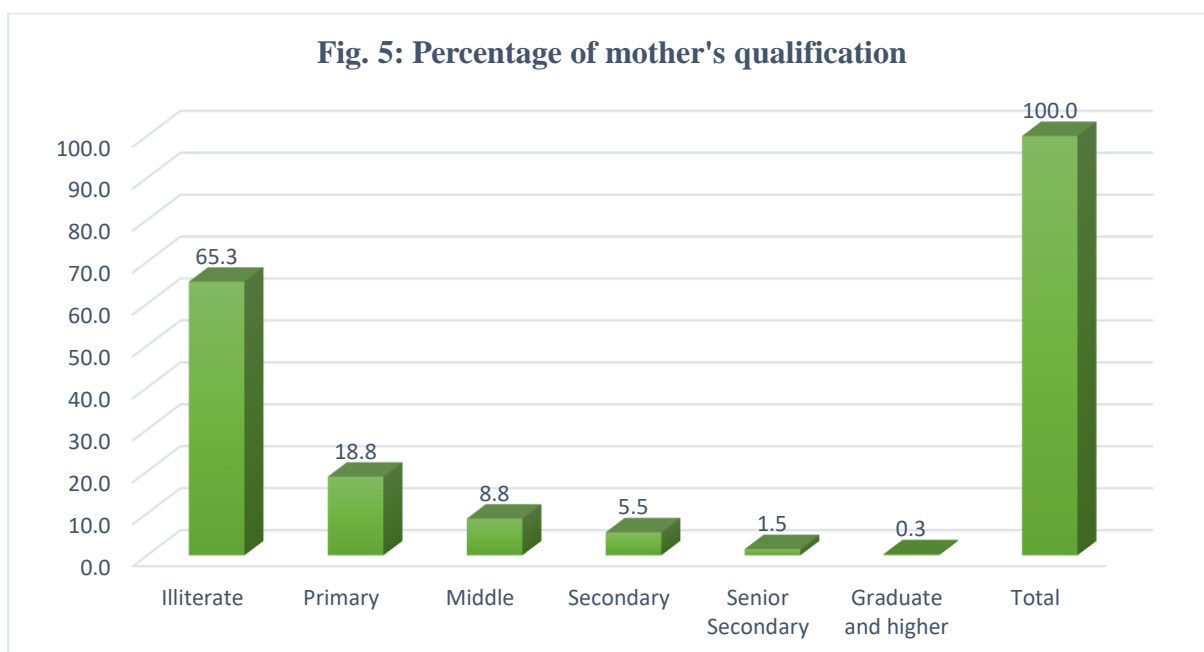
Above graph reveals that high dropout rate is found among Hindu children because the population of Hindu children higher in Ranchi district. After Hindu, Sarna religion children are also more in number of dropouts. Eastern parts of the subcontinent are home to the Indian religion known as Sarnaism. The concept is founded on worship at the Sarna, the holy trees located in the Jharkhand, Chhattisgarh and Odisha state's Chhota Nagpur Plateau region. After Sarna, Children of Islam religion are found more dropout in the district. Only 1.3% children found from Christian religion.



This graph reveals that 80.5% children are from nuclear family whereas only 19.5% children are from joint family in school dropout.

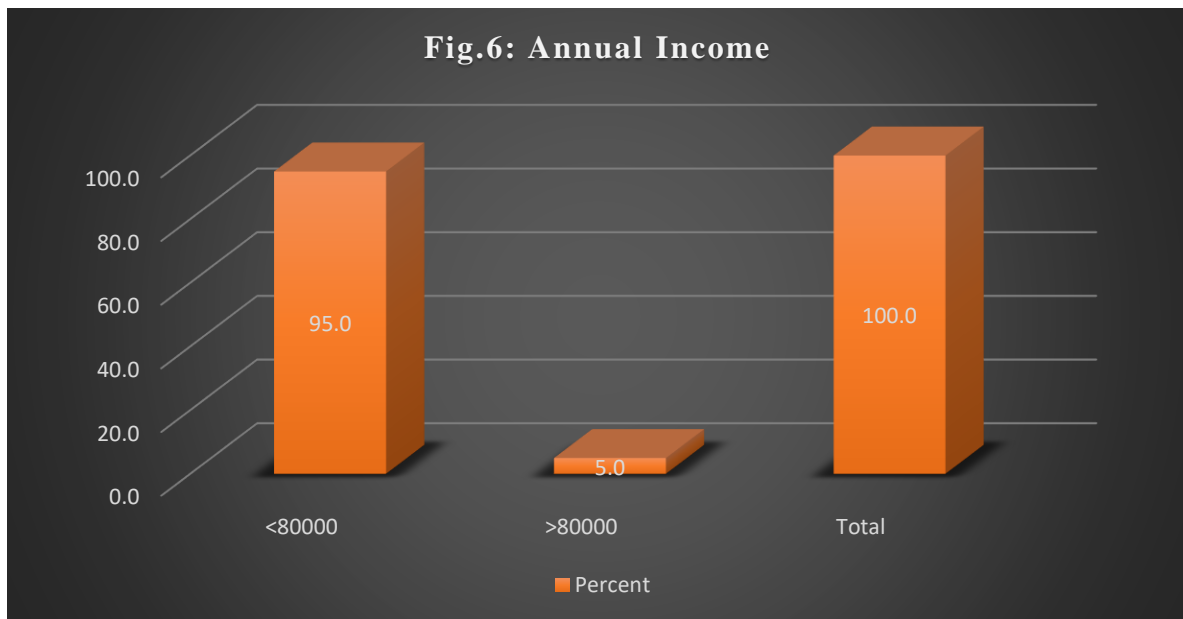


This graph is showing about qualification of fathers of dropout children and this independent variable is very crucial for dependent variable. In this graph it is revealed that 35.3% father of dropouts are primary school passed. 23% fathers of dropouts are up to middle school, 4.3% are senior secondary and 0.3% fathers are graduate. While 14% fathers are found illiterate which envisages that literacy level of parent is directly involved with student dropout.

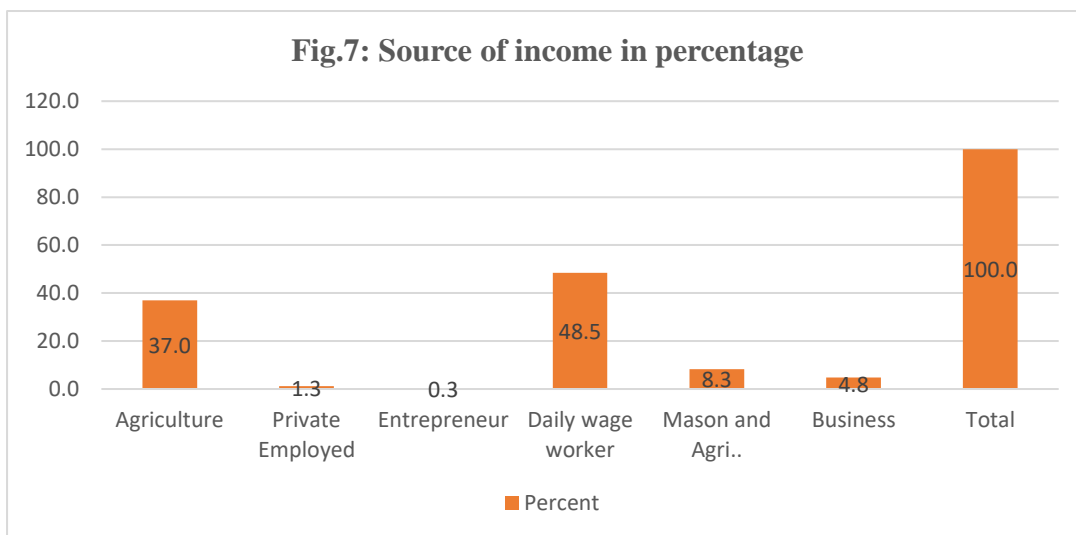


This one is very important because first teacher of student is his/her mother. This graph revealed that 65.3% mothers of dropout students are illiterate that's why these children have been dropped out from school. 18% mothers of dropout children are found primary school passed or till primary school, 8.8% of mothers reached till middle school, 5.5% mothers gone till

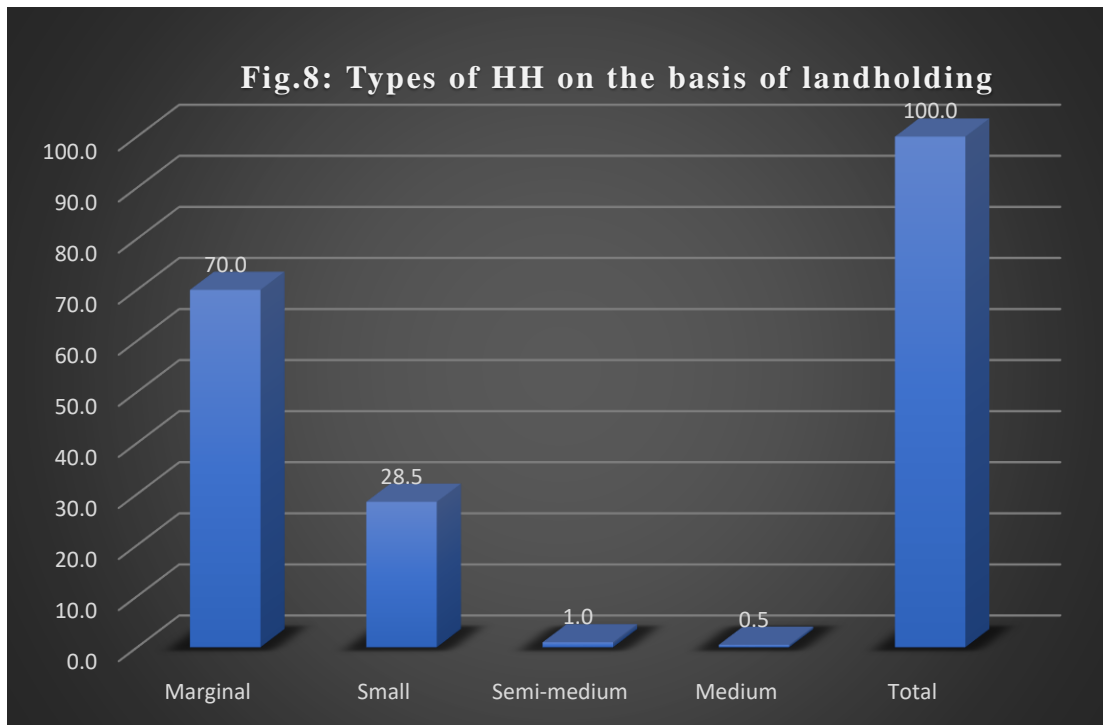
secondary school, 1.5% mothers reached till senior secondary level and only 0.3% mothers of dropout children reached till graduate level. It indicates that illiteracy among mothers of dropout children is major factor of dropout.



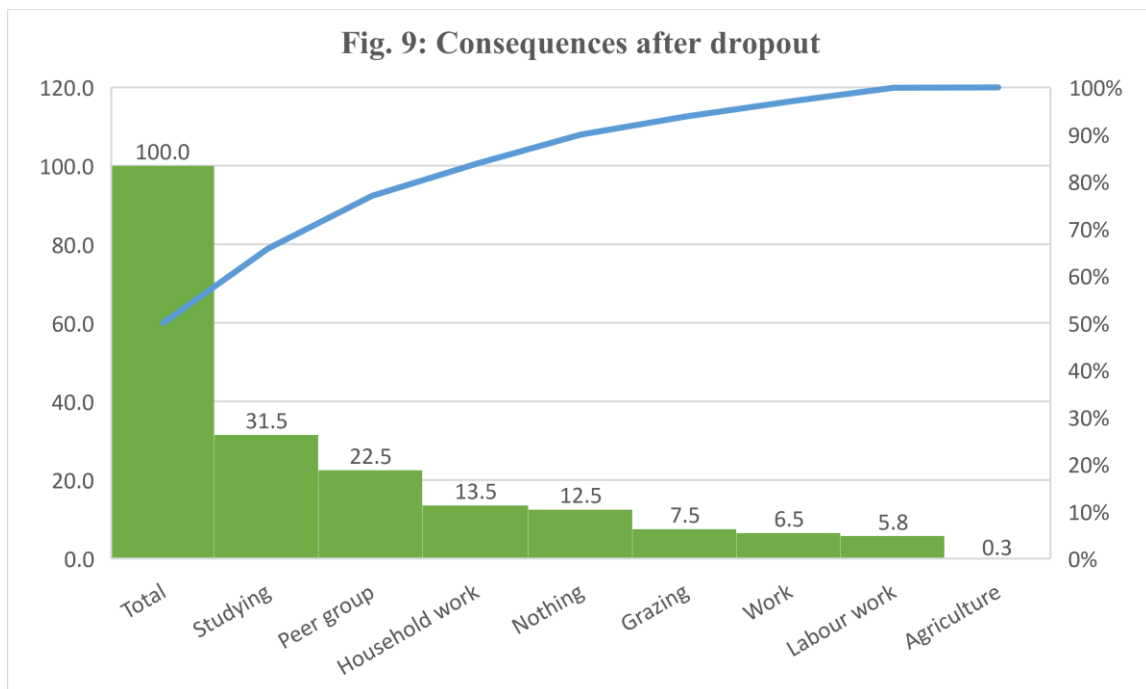
It is revealed that the parents of dropout who have less than Rs. -80000/- annual income are found 95% of dropout children whereas only 5% parents are found who have more than Rs. -80000/- annual income. It means most of the parents of dropout children are comes under poverty.



It is revealed that 48.5% parents of dropouts are daily wage worker, 37% parent agriculture, 8.3% Mason with Agriculture, 4.8% Business, 1.3% Private employed and only 1.3% parents are involved as their source of income.



This graph reveals that most of the parent of dropouts are marginal on the basis of landholding i.e., 70% parents are marginal farmers. 28.5% parent are small farmers, 1% semi-medium and only 0.5% parent are medium farmers on the basis of landholding. The parent of dropouts had not found large farmers on the basis of land holding. It can be said that most of parent of dropouts are very poor on the basis of their land holding.



This table is showing the consequences of the dropout children it means what they are actually doing after having dropout from school. It is found from this research that 31.5% Children again joined for studying the class, 22.5% engaged with their peer group, 13.5% engaged with

household work, 12.5% not doing anything, 7.5% children engaged with grazing, 6.5% engaged with simple work, 5.8% engaged with labor work and only 0.3% children are engaged with agricultural work.

Conclusion

From the title of Causes of school dropout among rural children in Ranchi Jharkhand it is decided to find out the causes the reasons of dropouts. The research is undertaken at four blocks of Ranchi district on the basis of high rate of dropouts received from education department. The dropout rate is found higher at 4 blocks Burmu, Mandar, Angara and Tamar so this work is undertaken among all these four blocks. It can be concluded from the analyzed data that most important factors of dropout are poverty it means lack of smartphone during lockdown because of poverty parent are unable to purchase smartphone. Due to lack of smartphone these students couldn't join their classes during lockdown period. According to the respondents, the primary reasons of their dropout from school are lack of smartphone during lockdown as well as lockdown problem, financial problem, lack of interest, migration, lack of support from family, failed in exam, poor health, child marriage etc. Researcher also found that quality of education in school is also responsible for retention of students. It is found that dropouts are more among the households who have not good socioeconomic condition. Dropouts are seen that they started to go school after completion of lockdown period. If quality of teaching in government school improves then dropout number will decrease.

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Child Labour Prohibition and Regulation Act 1986: A Review

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Introduction

The world is moving too fast and we are pushing ourselves beyond our limits. Many parents work every day and send their children to school. But 218 million children in the world work long hours in harsh and abusive conditions. Child labour is a shame for the society and the state. It prevents children from getting love, care and education. It harms their development and the society's progress. India has the highest number of child labourers in the world despite efforts to stop it.

The Child Labour (Prohibition and Regulation) Act 1986 is an important legislation that aims to protect the rights and welfare of children in India. It prohibits the employment of children below 14 years of age in certain hazardous occupations and processes, and regulates the conditions of work of children in other employments. It also provides for penalties for violating the provisions of the act, and empowers the government to make rules and appoint inspectors to enforce the act.

What is Child labour?

Child labour is typically known, when a child is engaging with any kind of economic activities, due to family or else known as child labour. Typically, children who are below 14 years old may know as child labour.

Why child labour act was made?

Child labour laws and acts were introduced to address the exploitation of children in the workforce and to protect their rights, well-being, and development. The primary goals of these laws include:

- **Protecting Children's Rights:** Child labour secure children's fundamental rights, such as the right to education, health, and a safe environment. Legislation is necessary to protect these rights and create a legal framework that ensures children are not subjected to exploitative and harmful work conditions.
- **Promoting Education:** Education is a powerful tool for breaking the cycle of poverty. Legislation that mandates compulsory education and restricts child labour helps ensure that children have access to quality education, which is critical for their future prospects and the overall development of society.
- **Preventing Exploitation:** Child labour often occurs in situations where children are exploited by employers seeking to benefit from their low wages and vulnerability. Children are mainly exploited by their higher authorities or by the customers. Sometimes they are beaten. Verbally abasement is a daily routine for them. Like for the tea stall or small shop are commonly known as non-hazardous sector. But in terms of

behaviour these are commonly granted as a hazardous sector. So, this legislation can help to reduce this cruelty.

- **Ensuring Health and Safety:** Many child labour activities take place in hazardous environments. Like it is mostly seen in Glass industry, Bangles industry, brick factory where children have to suffer not only low wages or abasement but also unhealthy condition. Legislation can establish regulations that protect children from exposure to dangerous substances, machinery etc.
- **Breaking the Cycle of Poverty:** Child labour promotes the cycle of poverty. As we know this vicious cycle of poverty is a dangerous for not only poor but any human being. As to break this we have to add substances from outside. Education, skills may help to break down this cycle. And to implementing of these kinds of laws help to do this.

Key Prohibition of Child labour prohibition and regulation act 1986

- Prohibition of Employment of Children in Certain Occupations and Processes:
- Under this act Children have to complete their 14 years age
- Children are prohibited from various hazardous work like Integrated Iron and Steel, Coal, Lignite, Coke, etc. Fuel Gases (including Coal Gas, Producer Gas, Water Gas).
- This legislation looks after on physical and mental well-being of children. Also, educational opportunities, ethical consideration, protection from harmful environment.

Regulation of Conditions of Work of Children

- Children are allowed in different non-hazardous sector like customer service industry, Art & Craft industry, gardening and Horticulture, Food preparation etc.
- Every day, the work schedule will be set. They will have a break between each work session, which will last for three hours. The break time will be one hour long
- In a day total period of work will be for six hours including rest period.
- No children will be permitted in work between 7pm to 8 am.
- Children are prohibited to do work for overtime.

Penalties and Enforcement

Child labour prohibition and regulation act 1986 imposes penalties on employers who violate its provisions in order to discourage and prevent the exploitation of child labour. These penalties including of monetary penalties also took charges from imprisonment to seizure of assets.

- Those person violets these laws have to pay in between ten thousand rupees to twenty thousand rupees.
- In case of imprisonment, when a person if he/she caught for first time he will be imprison for 3 months to 1 year. And he/she caught for second time will be imprisoned for 6 months to 2 years.

Exceptions and Provisions for Family Businesses

- This act recognised if a child engages with home-based work, then this act will not be for them.
- In terms of hours also will not be boundary as, when they will be in a family there will be a limited time for work.
- There is another place where this law provides some soft, that is when any child will engage with cultural practices and traditional industries.

Impact and Effectiveness

- This law helps in reduction of child labour. Between 2001 and 2011 child labour decreased 2.6 million.
- The penalties and legal consequences outlined in the Act have discouraged employers from employing children illegally, reducing instances of child labour in various industries.
- Increased awareness about children's right to education and the legal consequences of violating the Act has motivated parents and communities to send their children to school.
- Children who were previously engaged in hazardous work have been protected from physical harm and health risks, leading to improved overall health and well-being. The Act has reinforced the government's commitment to eradicating child labour.

Conclusion

In conclusion, the Child Labour (Prohibition and Regulation) Act, 1986, stands as a cornerstone in India's commitment to safeguarding the rights and well-being of its youngest citizens. Enacted to combat the pervasive issue of child labour, the Act reflects a society's collective recognition that children deserve a childhood free from exploitation, a safe environment for growth, and the opportunity to build a better future.

Effective enforcement, eradicating deeply rooted cultural norms that perpetuate child labour, and addressing socio-economic disparities are ongoing endeavours. The Act is not a standalone solution but part of a broader effort to create an environment where children can thrive, free from exploitation and deprivation.

Artificial Intelligence: Transforming Agriculture for Rural Prosperity

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Introduction

Agriculture has always been at the heart of human civilization, providing sustenance, livelihoods, and economic stability. In recent years, the integration of Artificial Intelligence (AI) into agriculture has emerged as a revolutionary approach to boost productivity, reduce waste, and promote sustainable rural development. This article explores the role of AI in agriculture and highlights some smart agricultural practices that are transforming rural communities around the world.

The Power of AI in Agriculture

Artificial Intelligence, a field of computer science, enables machines to learn and make decisions like humans. In agriculture, AI is used to analyse vast amounts of data, predict crop yields, optimize resource management, and enhance the overall efficiency of farming operations. Here is some key ways AI is making a difference in agriculture:

1. **Precision Agriculture:** AI-powered sensors, drones, and satellites collect data on soil quality, moisture levels, and crop health. Farmers can use this data to precisely apply fertilizers and pesticides, reducing waste and environmental impact.
2. **Crop Monitoring, Insect-Pests, and Disease Detection:** AI algorithms can analyse images of crops to identify diseases, pests, and nutrient deficiencies. This enables timely intervention and reduces crop loss.
3. **Weather Forecasting:** AI can process complex weather data and provide accurate forecasts. Farmers can make informed decisions on planting and harvesting times, reducing the risk of crop damage due to adverse weather conditions.
4. **Autonomous Farming:** Self-driving tractors and machinery equipped with AI technology can perform tasks like planting, harvesting, and weeding without human intervention, saving time and labour costs.
5. **Market Predictions:** AI can analyse market trends and predict crop prices, helping farmers make strategic decisions about what to plant and when to sell for maximum profit.

Smart Agricultural Practices

1. **IoT-Based Farming:** Internet of Things (IoT) devices like soil sensors and weather stations collect real-time data and transmit it to farmers' smartphones or computers. This allows farmers to monitor and control various aspects of their farms remotely.
2. **Crop Rotation and Diversification:** AI can analyse historical data to suggest optimal crop rotation and diversification strategies. This reduces soil depletion and increases overall yields.
3. **Smart Irrigation:** AI-driven irrigation systems use data on soil moisture levels and weather forecasts to determine when and how much water to apply. This prevents over-irrigation and conserves water resources.

4. **Blockchain for Transparency:** Blockchain technology is used to create transparent and secure supply chains. Farmers can trace their products from field to market, ensuring fair prices and quality control.
5. **Farm Management Software:** AI-powered software helps farmers with day-to-day management tasks, such as inventory control, financial tracking, and labour management, streamlining operations.

Benefits for Rural Development

The integration of AI and smart agricultural practices not only benefits individual farmers but also contributes to rural development in several ways:

1. **Increased Income:** Improved crop yields, reduced input costs, and access to better market information can significantly increase the income of rural farmers.
2. **Empowerment:** AI empowers farmers with knowledge and tools to make informed decisions, reducing their dependence on middlemen and empowering them in negotiations.
3. **Sustainability:** Sustainable farming practices promoted by AI help preserve the environment, ensuring the long-term viability of agriculture in rural areas.
4. **Skill Development:** The adoption of AI in agriculture necessitates training and upskilling of rural communities, creating job opportunities, and enhancing their skill sets.

Conclusion

Artificial Intelligence in agriculture is a game-changer, offering innovative solutions to age-old challenges. Smart agricultural practices driven by AI not only boost productivity and income for rural communities but also promote sustainability and empower farmers. As technology continues to advance, the future of agriculture and rural development looks brighter than ever.

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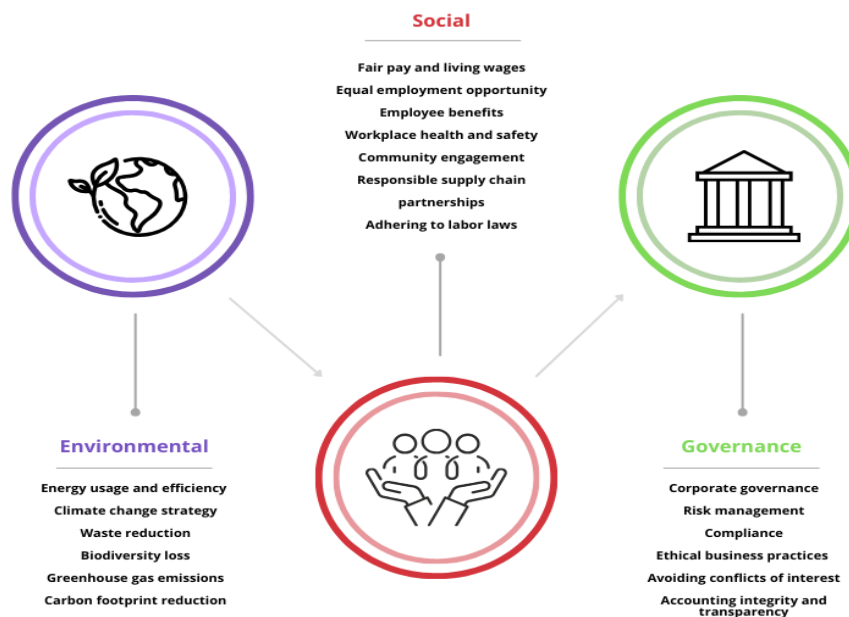
The Role of ESG (Environment, Social, and Governance) In Fostering Sustainable Rural India: ESG Attributes That Can Make a Difference

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Introduction

In the grand narrative of history, Mahatma Gandhi emerges as a towering figure whose ideas have continued to resonate across generations. His vision of rural development, steeped in principles of self-reliance, sustainability, and the welfare of rural communities, remains a beacon of inspiration. But how does this age-old vision align with the contemporary world of Environmental, Social, and Governance (ESG) investing? As we explore this intriguing connection, we embark on a journey to unveil how ESG, with its modern resonance, rejuvenates and amplifies Gandhi's timeless ideals of rural empowerment. This article delves into the synergy between Gandhi's vision and ESG principles, highlighting how ESG is not just a financial strategy but also a potent catalyst for sustainable rural development. As we navigate this convergence of past and present, we uncover a compelling narrative that showcases ESG's potential to breathe new life into rural communities, thereby fostering a brighter, more sustainable future in our ever-evolving global landscape.



Evolution of ESG in the Last 30 Years

The evolution of Environmental, Social, and Governance (ESG) principles in the realm of finance has not merely been a passage of time; it is an epic narrative of transformation that extends far beyond the world of investments. It encapsulates a profound shift in our perception of corporate responsibility, sustainability, and the intricate interplay between financial performance and the global challenges that define our era.

The Dawn of Socially Responsible Investing

The journey commences in the year 1990, a time when KLD Research & Analytics unveiled the world's inaugural socially responsible investment index. Back then, the focus of "socially conscious" investors was largely centered around issues related to human rights and pollution. The nascent belief that ESG factors could exert a tangible influence on financial performance was little more than a whisper amid the clamor of traditional investment paradigms.

The Era of Manual Data Collection

In an era before the ubiquity of the internet and the rapid dissemination of global information, the collection of ESG data was a laborious, painstakingly manual undertaking. The investment community relied heavily on conventional sources and voluminous reports to inform their decisions. At this stage, ESG was more a well-intentioned ideal than a practical tool for investors.

A Matured Concept

Fast-forward to the present, and we find ourselves in an ESG landscape dramatically distinct from its embryonic origins. The 2020s boast over 1,500 equity and fixed income ESG and Climate Indexes, meticulously designed to assist institutional investors in benchmarking ESG investment performance. The venerable MSCI KLD 400 Index, born in 1990, stands as a pioneering testament to this evolution. While the methodology underpinning ESG index creation has unquestionably matured, its core objective remains steadfast: to spotlight companies with stellar ESG ratings while steadfastly excluding those whose products cast a shadow of negative social or environmental impact.

Confronting Global Challenges

The dawn of the 21st century ushered in an array of formidable global challenges, including the seismic shocks of the COVID-19 pandemic, the relentless advance of climate change, and an invigorated emphasis on human rights. Paradoxically, these challenges have breathed new life into the ESG concept, imbuing it with fresh relevance and urgency. In the 2020s, sustainable investment assets—comprising ESG and impact investing—have burgeoned into a staggering \$30.7 trillion global ecosystem by 2018, according to the Global Sustainable Investment Alliance (GSIA).

The Technological Frontier

The contemporary ESG landscape operates at the forefront of technological innovation. No longer reliant on manual data collection, entities such as MSCI harness the formidable power of alternative data sources and artificial intelligence (AI) to unearth previously undisclosed data. These revelations, in turn, constitute a significant contribution to the calculation of MSCI ESG Ratings—a cornerstone in the edifice of MSCI ESG Indexes.

Climate Takes Center Stage

In the modern lexicon of ESG considerations, climate change emerges as the preeminent challenge of our era. No longer relegated to the periphery, climate-related factors occupy center stage. Investors have become increasingly fixated on climate solutions at the portfolio level.

Environmental considerations, particularly those intertwined with climate issues, have ascended to paramount importance in the discourse surrounding ESG investments.

The trajectory of ESG principles, from their tentative inception in 1990 to their global embrace and integration into financial strategies in the 2020s, offers a profound insight into the evolution of corporate responsibility. This journey is not just a chronicle of financial strategies; it is a testament to our evolving perception of the inseparable link between environmental stewardship, social responsibility, governance integrity, and financial performance. It underscores a paradigm shift in our approach to investment, one that harmonizes profitability with the imperative of confronting pressing global challenges. The narrative of ESG is a story that resonates beyond financial markets; it informs our stewardship of the planet and our collective voyage toward a sustainable future.

Cash Flow from Industries Towards Sustainability

The last half-decade has witnessed a significant shift in capital allocation as industries increasingly divert cash flows toward sustainability initiatives. This reallocation of financial resources reflects a growing recognition of the importance of addressing environmental, social, and governance (ESG) concerns. Here's how industries are channeling their cash flows into sustainability:

1. **Energy Transition:** The energy sector, once synonymous with environmental degradation, is undergoing a remarkable transformation. Major oil and gas companies are redirecting substantial portions of their capital toward clean energy sources, such as renewables and electric mobility. Investments in solar, wind, and battery technologies have surged, accelerating the global transition to a low-carbon economy. According to the International Energy Agency (IEA), global investment in renewable energy reached \$303.5 billion in 2020.
2. **Sustainable Finance:** The financial industry itself has become a key player in the sustainability movement. Banks, asset managers, and insurance companies are integrating ESG criteria into their investment decisions. The issuance of green bonds, social bonds, and sustainability-linked loans has skyrocketed, facilitating the financing of sustainable projects worldwide. In 2020, global green bond issuance reached a record \$269.5 billion, according to Climate Bonds Initiative.
3. **Technology Advancements:** The technology sector has been instrumental in driving sustainability. Investments in innovative solutions, like artificial intelligence, IoT, and data analytics, have enabled companies to optimize resource utilization, reduce waste, and enhance energy efficiency. This technological evolution aligns with sustainability goals, fostering more eco-friendly practices. The International Data Corporation (IDC) estimates that worldwide spending on IoT reached \$742 billion in 2020.
4. **Regulatory Compliance:** Regulatory changes are compelling industries to allocate funds for sustainability. Governments are introducing ESG-related requirements and penalties for non-compliance. Companies are thus allocating resources to meet these standards and avoid financial penalties.

Transition of Organizational Projects towards Rural Economy

The transition of organizational projects towards the rural economy holds significant implications for Environmental, Social, and Governance (ESG) considerations. As organizations increasingly recognize the importance of ESG factors in their operations, the shift toward rural economies presents a unique opportunity to align with sustainable and responsible practices.

From an environmental perspective (E), rural economies often offer more fertile ground for sustainable initiatives. Projects focused on renewable energy, organic agriculture, and afforestation can thrive in rural settings, contributing to reduced carbon footprints and biodiversity preservation. These initiatives not only benefit the environment but also enhance an organization's ESG profile by demonstrating a commitment to ecological stewardship.

Socially (S), rural projects can have a profound impact on local communities. By investing in rural economies, organizations can create employment opportunities, improve access to education and healthcare, and empower marginalized populations. This fosters social inclusivity and equity, two vital components of ESG criteria. Furthermore, engaging with rural communities in a respectful and collaborative manner builds trust, a fundamental aspect of social responsibility.

In terms of governance (G), the transition to rural economies necessitates robust oversight and ethical decision-making. Transparent governance structures, adherence to local regulations, and a commitment to fair labor practices are essential. Demonstrating strong governance principles enhances an organization's credibility and fosters trust among stakeholders. The transition of organizational projects toward rural economies can be a pivotal component of an ESG strategy. By embracing environmentally sustainable practices, promoting social well-being, and upholding ethical governance, organizations can not only contribute to the development of rural communities but also strengthen their own ESG performance and reputation. This alignment of objectives underscores the growing importance of ESG considerations in modern business practices.

Background of Community and Governance Relationship

The relationship between the community and governance plays a pivotal role in shaping sustainable development outcomes (Elliott, 2012). Historically, rural communities have relied on traditional systems of governance, characterized by local customs and hierarchies (Painter, 2016). However, with the advent of modern governance structures, there has been a shift in power dynamics, leading to both challenges and opportunities for sustainable development (Meadowcroft, 2013).

Traditional community-based practices often revolved around ecological conservation and resource management (Janaki et. al., 2021). These practices were deeply embedded in local culture and promoted sustainability through collective decision-making and resource sharing. However, rapid urbanization and industrialization have disrupted these age-old practices, leading to environmental degradation and social disintegration (Barraclough & Ghimire, 1995). Briggs (2005) suggest that the prospects for sustainable rural India lie in reconciling traditional knowledge with modern governance approaches. By recognizing and valuing the ESG (Environmental, Social, and Governance) attributes embedded in rural communities, policymakers can leverage their strengths for sustainable development. The ESG framework

can provide a holistic understanding of rural development that takes into account environmental protection, social inclusivity, and effective governance.

Prospects for Sustainable Rural India:

The prospects for sustainable rural India are promising when integrated with ESG attributes. Are mentioned as follows:

1. Environmental Prospects:

- **Natural Resource Conservation:** Rural areas possess rich natural resources, including forests, water bodies, and biodiversity. Sustainable management and conservation of these resources can ensure their long-term availability for future generations.
- **Organic Farming:** Encouraging and promoting organic farming practices can reduce the reliance on chemical inputs, protect soil health, and promote biodiversity.
- **Renewable Energy Adoption:** Rural India has immense potential for renewable energy sources such as solar, wind, and biomass. Investing in renewable energy infrastructure can provide clean and sustainable power for rural communities.
- **Rainwater Harvesting:** Implementing rainwater harvesting techniques can enhance water availability, recharge groundwater, and mitigate the impact of water scarcity in rural areas.
- **Afforestation:** Promoting afforestation initiatives can combat deforestation, prevent soil erosion, and enhance carbon sequestration to combat climate change.

2. Social Prospects:

- **Inclusive Growth:** Sustainable rural development must prioritize inclusivity to ensure that development benefits reach all sections of society, including marginalized communities and the economically disadvantaged.
- **Empowering Marginalized Communities:** Empowering marginalized communities through capacity building, skill development, and access to resources can foster social equity and reduce income disparities.
- **Promoting Gender Equality:** Women play a crucial role in rural development. Ensuring gender equality in decision-making, resource allocation, and access to opportunities can drive sustainable development outcomes.
- **Community-led Initiatives:** Supporting and strengthening community-led initiatives like self-help groups, cooperatives, and community-based organizations can foster local ownership and engagement in development projects.
- **Microfinance Schemes:** Facilitating access to microfinance and credit for rural entrepreneurs and small-scale farmers can catalyze economic growth and reduce poverty.

3. Governance Prospects:

- **Strengthening Local Governance:** Empowering local governance institutions, such as Panchayati Raj institutions, can enhance community participation in decision-making and planning processes.

- **Participatory Decision-making:** Encouraging participatory approaches in development planning ensures that the voices and needs of rural communities are heard and considered in policy formulation.
- **Transparency and Accountability:** Transparent governance mechanisms can build trust between communities and government authorities, ensuring efficient resource allocation and utilization.
- **Addressing Corruption:** Tackling corruption at all levels of governance is crucial to maintaining the integrity of development projects and ensuring that resources reach the intended beneficiaries.
- **Effective Resource Allocation:** Rational and effective resource allocation is essential for maximizing the impact of development projects and ensuring that they align with local priorities and needs.

Recommendations for Driving Sustainable Rural Development

- 1. ESG Integration in Rural Policies:** To enhance sustainable rural development, it is essential to integrate ESG attributes into the design and implementation of rural policies and programs. Policymakers should prioritize ESG factors, considering environmental sustainability, social inclusivity, and effective governance as key pillars of rural development strategies. This integration should be reflected in clear policy guidelines and funding allocations, ensuring that all rural initiatives align with ESG principles.
- 2. ESG Awareness and Capacity Building:** Promoting ESG awareness and capacity building among rural communities is crucial for driving positive change at the grassroots level. Conducting targeted awareness campaigns and providing training on eco-friendly practices, social inclusivity, and accountable governance will empower rural residents to actively participate in sustainable development efforts. Local leaders, community-based organizations, and educational institutions should collaborate to disseminate ESG knowledge effectively.
- 3. ESG Incentives for Rural Entrepreneurs:** Encouraging and supporting rural entrepreneurs who adopt ESG practices can catalyze sustainable economic growth. Governments and development agencies should provide financial incentives, grants, and technical assistance to startups and small businesses that prioritize environmental conservation, social responsibility, and transparent governance in their operations. These incentives can attract more entrepreneurs to embrace green and socially responsible business models, fostering a culture of sustainable entrepreneurship in rural areas.
- 4. ESG Reporting and Accountability:** Establishing robust ESG reporting and accountability mechanisms is vital to monitor the progress and impact of rural development initiatives. Implementing regular evaluations and audits of ESG practices in development projects will ensure transparency and effectiveness in resource allocation and utilization. Government agencies and project implementers should be required to disclose ESG performance indicators, demonstrating their commitment to

achieving sustainable outcomes in rural development. Additionally, fostering public-private partnerships for ESG reporting can enhance credibility and facilitate knowledge-sharing on best practices.

Conclusion

Enhancing sustainable rural India requires recognizing and embracing the inherent ESG attributes present within rural communities. By bridging the gap between traditional wisdom and modern governance, India can achieve inclusive and environmentally responsible development. Emphasizing the prospects of sustainable rural India and implementing recommended strategies will pave the way for a prosperous and resilient rural future. The transformational journey towards sustainability will require collective efforts from the government, civil society, and rural residents alike.

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Fertilizing Tomorrow's Gardens: The Sustainable Elixir of Organic Liquid Manures for Sustainable Pea Cultivation

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Introduction

In the hushed embrace of a crop field, where the whispers of nature weave their tales, a silent revolution is underway—a symphony of soil, seeds, and sustainability. This article will delve into the magic of organic liquid manure and how it's changing the way we grow garden peas, making our farms eco-friendlier and our peas tastier and healthier than ever.

The garden pea, scientifically known as *Pisum sativum* var. *hortense* L., is a prized legume vegetable crop celebrated for its high nutritional value. As an herbaceous annual plant belonging to the Fabaceae family, it enjoys worldwide cultivation, primarily for its delectable seeds. This cool-season, frost-resistant legume ranks second in importance for human consumption, following *Phaseolus vulgaris*, as noted by Taran et al. (2005). Garden peas thrive in cooler altitudes in tropical and subtropical regions during the winter months but are predominantly cultivated in temperate zones. In India, garden peas find their home in subtropical and temperate regions, as well as in the cooler parts of southern India. They adapt to various soil types but thrive in well-drained sandy loam soil with ample organic matter, providing essential nutrients for robust plant growth. Typically, garden peas are cultivated during the 'Rabi' season in plains and the summer season in hilly areas.

However, while agriculture strives to meet the nutritional needs of a growing global population, the extensive use of chemical fertilizers has raised concerns. Prolonged use of these fertilizers diminishes their effectiveness and adversely affects soil fertility and crop yields. Moreover, rising fertilizer prices have placed a financial burden on small-scale farmers. In light of these challenges, there is a pressing need for cost-effective and environmentally friendly alternatives to chemical fertilizers.

A promising alternative to chemical fertilizers lies in the application of liquid organic manures. These nutrient-rich solutions, comprising macro and micro-nutrients, amino acids, vitamins, and beneficial microorganisms, can enhance soil health and crop productivity. Liquid organic fertilizers are gaining popularity, largely due to the increasing availability of agricultural and industrial waste for their production. The preparation of these liquid manures follows a simple fermentation process that utilizes organic waste as a carbon substrate. The process involves collecting the necessary raw materials, mixing them in specific ratios, and allowing them to ferment for a prescribed period to ensure proper product fermentation. Regular stirring of the solution aids microorganism growth. Once the fermentation is complete, the manure is applied to the soil at recommended doses. The resulting liquid contains essential nutrients and microorganisms that promote the recycling of organic matter, with microorganisms playing a pivotal role in substrate degradation during fermentation. This fermentation process also yields phytohormones like auxin and cytokinin, organic acids, and plant growth promoters, which further enhance plant growth.

The utilization of these liquid manures, such as *Panchagavya*, *Sasyagavya*, *Sanjibani*, *Kunapajala*, *Vermiwasp*, and *Amrit Jal*, can stimulate plant growth and development when applied as foliar sprays or incorporated into the soil. Liquid manures offer an advantage over other organic alternatives due to their rapid leaf absorption, up to 20 times faster than soil absorption, and their ability to promote beneficial microbial activity in the soil. These eco-friendly options present a low-cost, high-return approach to agriculture, resulting in improved crop yields and soil health. By embracing organic liquid manures, farmers can access a cost-effective, environmentally friendly alternative to chemical fertilizers, contributing to sustainable agriculture practices.

Research Study: The Impact of Organic Liquid Manure on Garden Pea Cultivation

Building on the principles of organic farming and the effectiveness of liquid manures like *Panchagavya*, *Sasyagavya*, *Sanjibani*, *Kunapajala*, *Vermiwasp*, and *Amrit Jal*, a comprehensive study was undertaken to assess their influence on the growth, yield, and quality attributes of garden peas. This study, conducted in the South Chotanagpur Plateau of Jharkhand on the variety GS-10, had the following specific objectives:

- i. To examine the effect of organic liquid manure inputs on the growth and yield attributes of garden peas.
- ii. To evaluate the quality traits of garden peas under organic growing conditions.
- iii. To estimate the benefit-to-cost ratio of the crop under the influence of different organic liquid manures.

Details of the Experiments

Crop	Garden Pea
Variety	GS-10
Treatments	7 (Treatments were conducted in same fertility status of the experimental plots.)
Replications	3
Design	CRBD (Complete Randomized Block Design)
Season	Rabi
Spacing	20 cm x 30 cm (P-P x R-R)
Bed Size	3 m x 2.5 m
No. of beds	21 (21 beds for each of the experimental condition)
No. of plant/ bed	88

Experimental Design and Results

The study involved various treatments, each representing a different organic liquid manure input. These treatments included:

Treatment 1	<i>Panchagavya (3%)</i>
Treatment 2	<i>Sanjibani (10%)</i>
Treatment 3	<i>Sasyagavya (10%)</i>
Treatment 4	<i>Kunapajala (1%)</i>
Treatment 5	<i>Amrit Jal</i>
Treatment 6	<i>Panchagavya (3%) + Kunapajala (1%)</i>
Treatment 7	Control

The research was conducted at the Faculty Center of Agriculture, Rural & Tribal Development under the School of Agriculture and Rural Development of Ramakrishna Mission Vivekananda University in Ranchi, India, from October 2022 to February 2023. This study explores the impact of different organic liquid manure treatments on the growth, yield, and quality attributes of garden peas, shedding light on a more sustainable and efficient approach to crop production.

Growth Attributes of Garden Pea

One of the fundamental aspects of crop cultivation is understanding the plant's growth cycle and development. In this research, several growth attributes of garden peas were meticulously observed and analyzed. Here are some key findings:

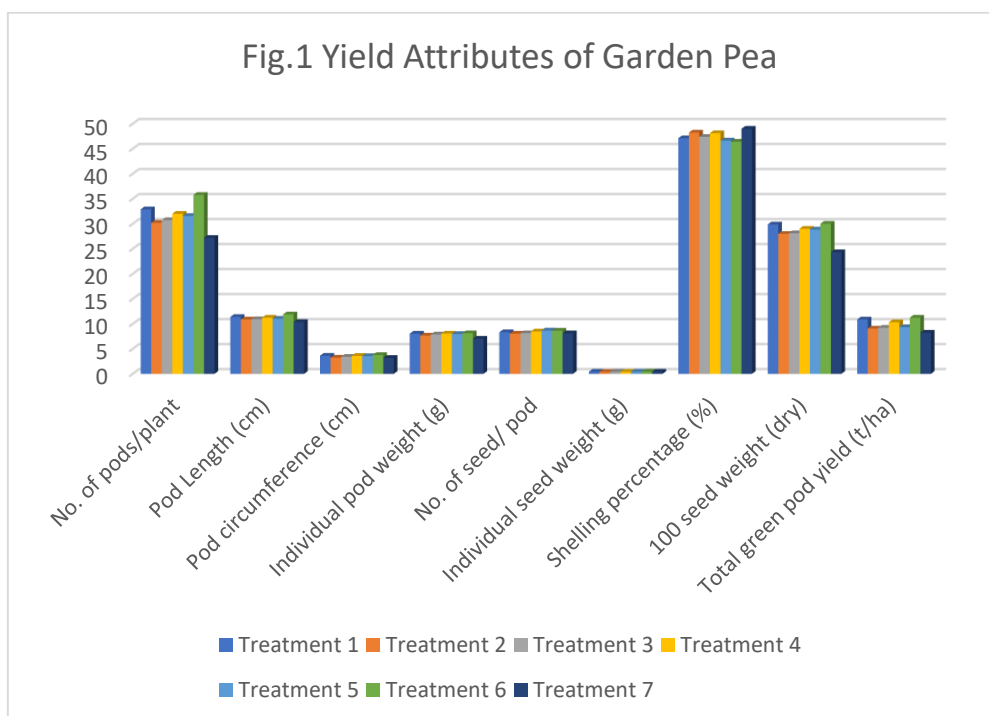
- **Days taken to 1st flowering:** The study reveals that the treatment T6 (Panchagavya + Kunapajala) exhibited the shortest time to 1st flowering, taking only 42.00 ± 1.258 days. This was closely followed by T5 (Amrit Jal) at 32.66 ± 1.02 days, while the control group, T7, took the longest at 45.67 ± 1.259 days. Early flowering is often associated with better crop management practices and can lead to improved overall yield.
- **Days taken to 50% flowering:** T6 (Panchagavya + Kunapajala) once again demonstrated its effectiveness, showing the shortest time to 50% flowering at 44.87 ± 0.797 days. In contrast, the control group, T7, took the longest at 52.00 ± 0.797 days. Early flowering is crucial in ensuring a shorter time to harvest and a more synchronized crop cycle.
- **Days taken to 1st pod setting:** T6 (Panchagavya + Kunapajala) also outperformed other treatments in this category, with the shortest time to 1st pod setting at 42.00 ± 1.239 days. Conversely, T7 (Control) took the longest at 54.33 ± 1.239 days. Rapid pod setting can contribute to higher overall yield.
- **Root length (cm):** The length of plant roots can indicate the plant's ability to access nutrients and water. T6 (Panchagavya + Kunapajala) showed the longest roots at 15.93 ± 0.717 cm, while the control group, T7, had the shortest at 13.23 ± 0.717 cm. Longer roots often signify better nutrient absorption and plant health.
- **Plant height (cm):** T6 (Panchagavya + Kunapajala) stood out as the treatment with the tallest plants at 95.34 ± 1.38 cm, followed by T5 (Amrit Jal) at 92.45 ± 1.38 cm. In

contrast, the control group, T7, had the shortest plants at 85.76 ± 1.38 cm. Increased plant height is indicative of healthy and vigorous growth, which can contribute to higher yields.

- **Number of branches per plant:** T6 (Panchagavya + Kunapajala) once again led in this category, boasting the most branches per plant at 14.86 ± 0.799 , followed by T5 (Amrit Jal) at 12.90 ± 0.799 . The control group, T7, had the fewest branches at 11.67 ± 0.57 . A greater number of branches can lead to more flowering sites and potentially higher yields.

- **Yield Attributes of Garden Pea**

The yield of garden peas is a critical factor for both farmers and consumers. This study examined various attributes related to pea yield:



- **Days taken to 1st harvesting:** While the time to 1st harvesting was not reported in the available data, other yield attributes provide valuable insights into overall productivity.
- **Pod length (cm):** T6 (Panchagavya + Kunapajala) showcased the longest pods at 11.89 ± 0.75 cm, indicating the potential for larger peas. Conversely, the control group, T7 (Control), had the shortest pods at 10.36 ± 0.75 cm.
- **Pod circumferences (cm):** T7 (Control) exhibited the widest pod circumferences at 3.76 ± 0.72 cm, while T6 (Panchagavya + Kunapajala) had the narrowest at 3.18 ± 0.72 cm. Pod circumference can influence the number of peas per pod and overall yield.

- **Individual pod weight (g):** T6 (Panchagavya + Kunapajala) boasted the heaviest individual pods at 8.06 ± 0.38 g, while the control group, T7, had the lightest at 5.57 ± 0.57 g. Heavier pods are indicative of larger, more substantial peas.
- **Number of seed/pod:** T6 (Panchagavya + Kunapajala) had the most seeds per pod at 8.63 ± 0.708 , while T2 (Sasyagavya) had the fewest at 8.04 ± 0.708 . A higher number of seeds per pod can significantly contribute to increased yield.
- **Individual seed weight (g):** T6 (Panchagavya + Kunapajala) once again led with the heaviest individual seeds at 0.44 ± 0.721 g. In contrast, T2 (Sasyagavya) had the lightest seeds at 0.39 ± 0.721 g.
- **Shelling percentage (%):** T6 (Panchagavya + Kunapajala) had the lowest shelling percentage at $46.60 \pm 0.918\%$, while the control group, T7, had the highest at $49 \pm 0.918\%$. Shelling percentage reflects the proportion of edible peas within the pod.
- **Dry weight of seed (%):** T6 (Panchagavya + Kunapajala) achieved the highest seed dry weight at $30.01 \pm 1.134\%$, while T7 (Control) had the lowest at $24.32 \pm 1.134\%$. Higher seed dry weight implies a greater yield of usable peas.
- **Total green pod yield (t/ha):** T6 (Panchagavya + Kunapajala) emerged as the top performer in terms of total green pod yield, achieving 11.23 ± 0.844 t/ha. In contrast, the control group, T7, had the lowest yield at 8.23 ± 0.844 t/ha. This finding underscores the significant potential for increased crop production through organic liquid manure application.

Quality Attributes of Garden Pea

Beyond quantity, the quality of garden peas is essential for both consumer satisfaction and nutritional value. The study delved into various quality attributes:

- **TSS (°BRIX):** T6 (Panchagavya + Kunapajala) secured the highest TSS (°Brix) at $13.1 \pm 0.72^\circ$ Brix, indicative of superior sweetness. Conversely, T7 (Control) had the lowest at $11.9 \pm 0.72^\circ$ Brix.
- **Titration acidity (%):** T6 (Panchagavya + Kunapajala) led with the highest titration acidity at $0.43 \pm 0.72\%$, while T7 (Control) had the lowest at $0.21 \pm 0.72\%$. Titration acidity impacts the overall taste and flavor of peas.
- **Ascorbic acid (mg/100g):** T6 (Panchagavya + Kunapajala) displayed the highest ascorbic acid content at 21.56 ± 2.760 mg/100g, while T7 (Control) had the lowest at 38.60 ± 2.760 mg/100g. Ascorbic acid, also known as vitamin C, contributes to the nutritional value of peas.
- **Reducing sugar (%):** T7 (Control) had the highest reducing sugar content at $1.35 \pm 0.710\%$, while T6 (Panchagavya + Kunapajala) had the lowest at $0.47 \pm 0.710\%$. Reducing sugars are associated with sweetness and energy content.
- **Total sugar (%):** T6 (Panchagavya + Kunapajala) had the highest total sugar percentage at $8.46 \pm 0.733\%$, while T7 (Control) had the lowest at $8.01 \pm 0.733\%$. Total sugar content contributes to both taste and nutritional value.

- **Protein content (%):** T7 (Control) had the highest protein content at $7.53 \pm 0.719\%$, while T6 (Panchagavya + Kunapajala) had the lowest at $7.15 \pm 0.719\%$. Protein is a crucial element of a well-rounded diet.
- **Chlorophyll-a (mg/g):** T6 (Panchagavya + Kunapajala) exhibited the highest chlorophyll-a content at 0.64 ± 0.724 mg/g, while T7 (Control) had the lowest at 0.48 ± 0.724 mg/g. Chlorophyll contributes to the green coloration of peas.
- **Chlorophyll-b (mg/g):** T6 (Panchagavya + Kunapajala) also displayed the highest chlorophyll-b content at 0.41 ± 0.721 mg/g, while T7 (Control) had the lowest at 0.14 ± 0.721 mg/g. Both chlorophyll-a and chlorophyll-b are essential for photosynthesis and plant health.
- **Total Chlorophyll content (mg/g):** T6 (Panchagavya + Kunapajala) recorded the highest total chlorophyll content at 0.83 ± 0.728 mg/g, with T7 (Control) having the lowest at 0.49 ± 0.728 mg/g. Chlorophyll content can impact the overall health and appearance of garden peas.

The study's comprehensive findings have cast a spotlight on a particular treatment, T6, which combines *Panchagavya* and *Kunapajala*—an organic liquid manure concoction. This treatment has emerged as the game changer for enhancing the growth, yield, and quality attributes of garden peas under organic growing conditions. It not only surpassed other treatments but did so with remarkable significance. The overarching message of this research study is clear: organic liquid manure has the potential to revolutionize agriculture. The remarkable performance of *T6 (Panchagavya + Kunapajala)* underscores the capacity of organic farming practices to not only match but surpass conventional methods in terms of yield and quality. This is a pivotal moment in sustainable agriculture practices, and the implications are profound. In an era marked by environmental concerns, the study's findings are particularly significant. The success of *T6 (Panchagavya + Kunapajala)* in enhancing garden pea cultivation represents a crucial step towards more sustainable agricultural practices. By harnessing the potential of organic liquid manure, farmers can reduce their reliance on chemical fertilizers and pesticides, thereby minimizing harm to the environment. This shift aligns perfectly with the global push for eco-friendly farming methods.

In conclusion, the findings of this comprehensive research study are not just a scientific achievement; they are a beacon of hope. They reveal that *T6 (Panchagavya + Kunapajala)* is not merely a treatment but a symbol of progress—a symbol of a brighter, more sustainable future for garden pea cultivation and agriculture as a whole. It is a testament to the power of innovation and environmental responsibility, ushering in a new era of farming where growth, yield, and quality harmoniously coexist with ecological well-being.

Future Research Scope

While this study has provided valuable insights into the benefits of organic liquid manures on garden pea cultivation, there is room for further research. The following areas warrant attention in future studies:

- **Exploring Other Organic Liquid Manures:** Future research should experiment with additional organic liquid manures to identify the most suitable options for various crops.

- **Optimizing Manure Concentrations:** Different concentrations of liquid manures should be explored to determine the most effective doses for optimal plant responses.
- **Long-Term Studies:** Conducting the experiment over multiple years would provide a more comprehensive understanding of the long-term effects of organic liquid manures.
- **Multi-Locational Trials:** Expanding the study to multiple locations would help validate the technology's commercial viability.
- **Comprehensive Assessment:** Future studies should consider a wider range of quantitative and qualitative parameters, including anti-nutritional factors.
- **Mixed Cropping Systems:** Exploring the use of long-strawed pea cultivars mixed with oat in organic farming systems, along with various organic liquid manures, could be a promising avenue for research.

A Call to Action

The reflection of this research study becomes evident that a transformative change is within reach. It is a call to action for farmers, agricultural researchers, and policymakers to embrace and promote organic farming practices. The success of *T6 (Panchagavya + Kunapajala)* demonstrates that not only can we ensure better yields and higher-quality produce, but we can also do so while safeguarding the environment. It is a testament to the fact that we can meet the ever-growing demand for food while preserving our planet for generations to come. As the symphony of agriculture unfolds, we heed this call. Through continued research and the gentle adoption of these harmonious practices, we pledge to nurture not just our crops but the very earth from which they spring. Together, we embark on a journey where growth, abundance, and environmental stewardship dance in synchrony—a waltz of hope in the garden of tomorrow.

