International Journal of Scientific Engineering and Research (IJSER)
ISSN (Online): 2347-3878
Impact Factor (2020): 6.733

Socio-Economic Model for Organic Waste Management in Reference to Sustainable Management

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Abstract: ***Purpose: Highlighting the importance of combining organic and cattle farming along with human resource management in the rural areas of India by introducing a socio-economic model based on modern biotechnological processes to convert animal wastes into high-quality manures on a mass scale that can be efficiently marketed in the rural areas. Design / Methodology / Approach: Survey data collected from onsite visit of Soraon located in Prayagraj, India and different research papers for reference were used for analysis and data collection. Findings: We performed metabolic analysis and found various factors which lead less usage by farmer's communities. As It takes more Preparation time than usual. It requires more manpower as manual mixing is hard to handle. Undesirable result is common in these processes and procedures. It expels out the exceptional Odour (if not mixed properly). Therefore, we need to develop technology and strategy for the preparation of organic manure which will overcome all the a short-coming and increase farmers' revenue. To incorporate all these benefits, it is necessary to develop a model wherein, cattle farms have an electrically driven fermenter, installed to produce the above-mentioned organic manure in 7-10 days. Such an agronomic model should incorporate various social and cultural values for successful rural development. Practical Implications: We are highlighting the possibility of organic farming across the nation by establishing a socio-commercial model that can result in revenue generation by combining organic and animal farming practices for agronomic and rural development as well as to produce organic manure for modern farmers that have a short processing time, is more efficient and gives a high yield.***

Keywords: Jeevamrut, Panchagavya, Socio-economic, Agribusiness

1.Introduction

Soil is one of the most important hosts which influence various biochemical and microbial processes. But using chemical fertilizers and pesticides has led to a decrease in soil's organic content, taking a heavy toll on the environment. This resulted in poor soil health, less crop yield, and overall economic loss to farmers. Therefore, it is pertinent to develop faster and more efficient Organic Manures by improving traditional approaches to organic farming by incorporating the latest biotechnology ideas that can compete and decrease the use of toxic chemical fertilizers. We conducted our study in Soraon, Prayagraj. We studied and collected data which revealed that more than half of the respondents (51.67 percent) were medium landholders, more than one-third of respondents had high school (38.33 percent) education, nearly half (49.50 percent) of the respondents were having pakka house, 1% percent of the respondents were following agriculture as their main occupation. Therefore, we briefly highlight the impact of farming revolutions and the problems faced by farmers in India.

In our analysis of the total cattle waste in India and the area of arable land, we highlight the possibility of organic farming across the nation. By utilizing readily available raw materialist is possible to accommodate a socio-commercial model that can result in revenue generation by combining organic-and animal-farming practices for agronomic and rural development. For example, organic has been successfully used in the state of Sikkim, India. Unprocessed animal waste such as cow dung is directly applied to the field which maintains soil health but does not provide yield comparable to synthetic fertilizers. Therefore, it is important to produce organic manure, for modern farmers that have a short processing time, efficient and high yield providing qualities such as Panchagavya and Jeevamrut that have met with decent success in West and South Indian states, which are prepared by fermenting cow dung and urine. Recently, we performed metabolomic analysis and have identified the various biochemicals that make this organic manure efficient for agriculture purposes. Although very efficient, this organic manure is used by a small percentage of the farming communities' i. e., 650, 000 hectares in a total arable land of 160 million hectares. This is because of several shortcomings such as preparation time (10-30 days); manual mixing (laborious and expensive); undesirable results and odours (if not mixed properly) causing farmers to abandon organic farming practices and revert to synthetic fertilizers that are readily available and easy-to-use. Hence, the need of the hour is to develop technology and strategy for the preparation of organic manure which will overcome all the above-mentioned short-coming and increase farmers' revenue. To incorporate all these benefits, it is necessary to develop a model wherein, cattle farms have an electrically driven fermenter, installed to produce the above-mentioned organic manure in 7-10 days. Such an agronomic model should incorporate various social and cultural values for successful rural development.

1. Panchagavya

Panchagavya is known to boost immunity and promote plant growth. Cow dung and cow urine are the key ingredients of the preparation. It is usually mixed with

water and is used to irrigate the fields. It can also be used as a spray.3% solution of Panchagavya can be used to soak the seeds or dip the seedling before planting. Soaking for 20 minutes is sufficient. Rhizomes of Turmeric, Ginger and sets of Sugarcane can be soaked for 30 minutes before planting.3% of Panchagavya solution can be used to dip the seeds before drying and storing them.

Preparation of Panchagavya

Panchagavya Ingredients include 5 items from Indian Cow and 4 items from plants. It can be loosely translated as 'Five products of cow'. As the name suggests it uses five products from cows and a few more natural ingredients for the fermentation process. Here is what you need to prepare this magic potion. Note that all the cow products must be from desi cow variety.

- Fresh Cow Dung-5 kg.
- Cow Urine (need not be fresh)-3 litres.
- Cow Milk boiled and cooled (not refrigerated)-2 litres. Fresh Cow Curd-2 litres.
- Cow Ghee-500 grams Well-ripened Bananas-12.
- Black organic jaggery dissolved in 3 litres of water (Alternatively use11 sugarcane juice of the same volume)-500 grams.
- Fresh Tender coconut water-3 litres. Fresh Grape Juice-2 Litres

Process

1) Take a wide-mouth plastic, clay or wooden container. Do NOT use a metal container. Make sure it's clean and sundry it for a day or two to sterilize it. Mix the cow dung and ghee in the container using a wooden stick. Again, do not use any metal here. Stir in clockwise direction in a rhythmic motion. Then stir in an anticlockwise direction. Do not mix11 vigorously. It will kill the beneficial microbes in cow dung.
2) Cover the container using a thick cloth to protect it from insects. Leave this mixture for three days. Keep it away from direct sunlight and rain. Give it a stir once in the morning and once in the evening. Twelve times in each direction works well.
3) On the fourth day slowly stir in all other ingredients. Make sure you are mixing them in while stirring the mixture in a single direction slowly.
4) Leave this to ferment for 15 days. Give it a stir once in the morning and once in the evening. Your Panchagavya is now ready to use. Store it in a place away from direct sun12 and rain. Keep it covered and give it a stir two times a day. If you follow these guidelines, you can store this concoction up to 2 months.

2. Jeevamrut

Jeevamrut is a pure liquid organic fertilizer. Improves the PH of the soil. It is an excellent source of carbon, Nitrogen, Phosphorous, Potassium, and other essential micronutrients. It increases the microbial count and useful bacteria in the soil. Apply 5% to 10% in water, and for soil, use 100-200 Litres. per acre during irrigation. According to growth of the crop and convenience one can use it once at an interval of 7-15 days. Spray during dawn or dusk on any crop, for promoting growth, flowering and yield increase.

Preparation of Jeevamrut

1. Take 200 litre of water in barrel.
2. Take 10 kg local cow dung (Indian breed) and 5-10 litre cow urine (Gomutra) and add it to water.
3. Add 2 kg jaggery (Gud), 2 kg pulses flour and a handful soil from the bund of the farm in barrel.
4. Then stir the solution well and keep it for 48 hours in the shadow.13
5. The mixture needs to be stirred couple of times for minimum 10 minutes. It gets fermented. After 48 hours Jeevamrut is ready to use. It can be used for 2-3 days.

Fertilizer Consumption

Growth in fertilizer consumption in India

Fertilizer use was very low and was confined to plantation crops. The introduction of fertilizer-responsive HYVs and expansion in the irrigated area led to a sharp increase in fertilizer application on field crops. Per-hectare fertilizer consumption is higher in the case of crops with a larger proportion of the irrigated area. About 40 percent of the agricultural area in India is irrigated, accounting for 68.5 percent of total fertilizer consumption. Six crops (rice, wheat, cotton, sugar cane, rapeseed and mustard) are estimated to account for more than two-thirds of the total fertilizer consumption in the country. The use of plant nutrients per hectare is relatively low and imbalanced, and this is one of the major reasons for low crop yields in India.

Year	Fertilizer (NPK) Consumption	
	Million Ton	Kg/ha
1969/70	1.98	11.04
1979/80	5.26	30.99
1989/90	11.57	63.47
1999/2000	18.07	94.9
2000/01	16.7	89.3
2001/02	17.36	92.8
2002/03	16.09	86.01
2010/13	16.8	89.8

Fertilizers used on important crops-

Before the 1950s, fertilizer use was very low and was confined to plantation crops. The introduction of fertilizer-responsive HYVs and expansion in the irrigated area led to a sharp increase in fertilizer application on field crops. Per-hectare fertilizer consumption is higher in the case of crops with a larger proportion of the irrigated area. About 40 percent of the agricultural area in India is irrigated, accounting for 68.5 percent of total fertilizer consumption. Six crops (rice, wheat, cotton, sugar cane, rapeseed and mustard) are estimated to account for more than two-thirds of the total fertilizer consumption in the country. The fertilizer-use pattern for major crops is discussed below,

Crop	Gross cropped area (million ha)	Share in fertilizer consumption (%)	Fertilizer consumption (kg/ha)			
			N	P2O5	K2O	Total
Cotton	8.5	6	89.5	22.6	4.8	116.8
Irrigated	2.9	2.7	115.7	30.9	7	153.5
Rainfed	5.6	3.3	75.8	18.2	3.6	97.7
Groundnut	6.6	2.9	24.4	39.3	12.9	76.6
Irrigated	1.2	0.8	35.3	53.8	28.9	118
Rainfed	5.4	2.1	21.9	36	9.2	67.2
Jute	0.8	0.2	38	11.5	5	54.4
Irrigated	0.3	0.1	55.9	22.4	10.2	88.6
Rainfed	0.5	0.1	28.9	6	2.3	37.1
Maize	6.6	2.3	41.7	14.7	3.8	60.2
Irrigated	1.5	0.8	59.6	27.7	4.8	92.1
Rainfed	5.1	1.5	36.6	11	3.6	51.1
Paddy	44.7	31.8	81.7	24.3	13.1	119.1
Irrigated	24	22.2	103.4	32.8	18.8	155
Rainfed	20.7	9.6	56.6	14.5	6.5	77.6
Pearl millet	9.8	1.7	21.9	5.5	0.8	28.2
Irrigated	0.8	0.4	62.2	13.9	3.4	79.5
Rainfed	9	1.3	18.4	4.8	0.6	23.8
Pigeon pea	3.6	0.8	20.9	13.3	2	36.2
Irrigated	0.2	0.1	36.9	20.9	2.2	60
Rainfed	3.5	0.7	19.6	12.6	2	34.2
Rapeseed & mustard	6	3.4	69.1	25	2.9	97
Irrigated	3.8	2.6	81.7	30.4	4.3	116.5
Rainfed	2.2	0.8	45.9	15	0.4	61.3
Sorghum	9.9	2.9	29.2	14.2	4.1	47.5
Irrigated	0.8	0.5	58.5	29.1	10.7	98.3
Rainfed	9.1	2.4	26.9	13	3.6	43.6
Sugar cane	4.3	5.4	124.8	44	38.3	207.1
Irrigated	4.2	5.3	126.4	45	40.6	212
Rainfed	0.1	0.1	106	32	12.4	150.4
Wheat	25.7	21	99.6	30.2	6.9	136.7
Irrigated	22.8	19.7	105.6	32.1	7.3	144.9
Rainfed	2.9	1.3	55.7	15.9	4.3	75.9
Other crops	60.4	21.6	34.5	18.5	7.1	60.1
Irrigated	12.6	13.3	113.5	46.8	16.5	176.7
Rainfed	47.8	8.3	13.6	11	4.7	29.3
All crops	187	100	59.2	22.1	8.5	89.8
Irrigated	75.1	68.5	103.2	35.3	14.5	153.1
Rainfed	111.9	31.5	29.7	13.1	4.5	47.3
Irrigated	0.3	0.1	55.9	22.4	10.2	88.6
Rainfed	0.5	0.1	28.9	6	2.3	37.1

2.Materials & Methodology

Tentative Materials Required for Preparation per 50 litres organic manure (General)

	Panchagavya (Pc)	Jeevamrut (Ja)
Cow Dung	12.5 Kg (75 INR)	7.5 Kg (45 INR)
Cow Urine	12.5 L (187.5 INR)	7.5 L (112.5 INR)
Gram flour	-	1.25 Kg (150 INR)
Jaggery	-	1.25 Kg (75 INR)
Cow milk	6 L (240 INR)	-
Cow curd	6 Kg (600 INR)	-
Cow cream	100 g (34 INR)	-
Water	12.9 L	32.5 L
Production cost	=1136.5 INR/ 50L (22.73 INR/ L)	=382.5 INR/ 50L (7.65 INR/L)
pH	7.02	6.081
Chemicals used	nil	nil

The table of general components of panchagavya and jeevamrut are having general composition been practiced since ancient times. So, we analyzed and start preparing to perform the general test and came to know that,

For panchagavya-

The production cost is 1136.5 rupees/litre and ph of panchagavya as organic manure is 7.02.

For jeevamrut-

The production cost is 382.5 rupees/litre and ph jeevamrut as organic manure is 6.08.

Therefore, we obtain the production cost of each organic matter at per litre and its calculated ph.

Tentative Materials Required for Preparation per 70 litres of organic manure (Newly prepared based on data analysis)

	Panchagavya (Pc)	Jeevamrut (Ja)
Cow Dung	12.5 Kg (75 INR)	7.5 Kg (45 INR)
Cow Urine	17.5 L (262.5 INR)	12.5 L (187.5 INR)
Gram flour	-	1.25 Kg (150 INR)
Jaggery	-	1.25 Kg (75 INR)
Cow milk	6 L (240 INR)	-
Cow curd	6 Kg (600 INR)	-
Cow cream	100 g (34 INR)	-
Water	26.5 L	46.5 L
Used Chai Patti	300g	450g
Besan	500g (20 INR)	500g (20 INR)
Production cost	=1231.5 INR/ 70L (17.59INR/L)	=477.5 INR/ 70L (6.8 INR/ L)
pH	6.67	6.89
Chemicals used	nil	nil

By researching and preparing new mixture composition based on data analysis of new materials to be added to panchagavya and jeevamrut we found that compost tea leaves and besan are high in nutrition composition with some trace amount of minerals which is available at no cost or low cost.

We added to compost tea leaves and besan as follows-

For Panchagavya-

In Panchagavya, the compost tea leaves are 300g and besan is 500g as a newly added constituent in its composition and the basis of data analysis and calculation.

For Jeevamrut-

In Jeevamrut, the compost tea leaves are 450g and besan is 500g as a newly added constituent its composition and the basis of data analysis and calculation.

After fermentation, we measure the ph of both organic manures and we observed that ph of-

Panchagavya ph is 5.93 and Jeevamrut ph is 6.23

Therefore, to bring the ph to a suitable need for soil, we added water up to 20 litres more in both and mixed them thoroughly and allowed to ferment for few days.

After few days we measured the ph and we observed that-

For Panchagavya-ph is 6.67 and For Jeevamrut-ph is 6.89

Therefore, this is found to be best suitable ph required for soil. Hence, we have achieved best suitable ph for panchagavya and jeevamrut.

3.Methodology

Collection of cow dung and urine

In this step, we will collect waste from the farm. Preparation of manure is done that needs to be fermented, preferably fresh cow manure (fresh manure is better than old manure). At the same time, adding some leavening agent to promote fermentation, for producing 70 litres of organic manure, 12.5 kg of fresh cow dung with 100g-200g of leavening agents.

Fermentation of animal waste

In this step, mixing of fermentation materials and controlling their water is done to achieve content to about 60%. Under this humid condition, materials can be fully fermented into stable humus with the help of aerobic bacteria. If raw materials contain too much water (especially fresh cow dung), it is convenient to use a cow dung dewatering machine to remove the excess water quickly. Also, On Cattle farms we can install an electrically driven fermenter, to produce the above-mentioned organic manure in 7-10 days. Such an agronomic model should incorporate various social and cultural values for successful rural development.

Step 3: Composting.

Now, we will pile up the stirred raw materials in windrows, with a height of about 1.2m, width 1-2m, and length not limited.

Step 4: Test on field.

Now, organic manure that is produced is applied to the fields for better crops and to retain their soil fertility.

Some monetary benefits

1: Women's Empowerment

Promoting women's sense of self-worth, their ability to determine their own choices, and their right to influence social change for themselves and others.

2: Increase in Wages

An increase in demand or a reduction in supply will raise wages; an increase in supply or a demand reduction will lower them. The demand curve depends on the marginal product of labor and the price of the good labor produces.

3: Promotion of Atma Nirbhar Bharat

This model will also promote the government's various schemes under Atma Nirbhar Bharat.

4: Increment in MSME

This model also supports various small, medium-scale enterprises for various projects that will support large industries for refined raw materials and also for generating job opportunities within rural areas.

Increase in organic farming practices

This model also supports and promotes increment in the practicing of organic farming in various corners of India.

5: Reduces pesticide and chemical residue in the soil

Organic farming minimizes the use of pesticides and chemicals thereby reducing the major environmental issues. It ensures the health of the soil, water, air and flora and fauna. Also reduces the major environmental issues like soil erosion, air pollution, water pollution etc.

6: Organic farming fights against Global warming

One of the studies showed that continuous use of organic farming practices reduces the carbon di oxide content in air and helps in slow climate change.

7: Organic farming ensures water conservation and controls water pollution

Due to runoff and leaching of pesticides and chemicals, the water reservoirs are getting polluted and killing many aquatic flora and fauna. Organic farming helps in keeping our water supplies unpolluted and clean by stopping polluted chemical and pesticides runoff.

8: Organic farming preserves animal health and welfare

Pesticides and chemical sprays disturb and destroy the natural habitat of majority of insects, birds, fishes etc. On the contrary organic farming helps in preserving the natural habitat along with encouraging birds and other natural predators to live happily in the farmland which acts like natural pest control.

9: Organic farming encourages biodiversity

Organic farming reduces use of pesticides, herbicides and other harmful chemicals which wash off the major soil flora and fauna. By encouraging organic farming, natural plants, insects, birds, and animals will survive and be abundant in the natural environment there by maintaining he ecological balance.

4.Data analysis and Result

	Panchagavya	Jeevamrut	Average ph
Price based on traditional practices	22.73 INR/ L	7.65 INR/ L	6.55
Price based on newly prepared practices	17.59INR/ L	6.8 INR/ L	6.78
Change in price	5.14 INR/L	0.85 INR/L	

The general components of panchagavya and jeevamrut which are having general composition been practiced from ancient times. So, we analyzed and start preparing to perform general test and came to know that,

For panchagavya-

Here, the production cost is 1136.5 rupees/litre and ph of panchagavya as organic manure is 7.02.

For jeevamrut-

Here, the production cost is 382.5 rupees/litre and ph jeevamrut as organic manure is 6.08. Therefore, we obtain the production cost of each organic matter at per litre and its calculated ph.

By researching and preparing new mixture composition based on data analysis of new materials to be added to panchagavya and jeevamrut we found that compost tea leaves and besan are high in nutrition composition with some trace amount of minerals which is available at no cost or low cost.

We added to compost tea leaves and besan as follows-

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Therefore, to bring the ph to a suitable need for soil, we added water up to 20 litres more in both and mixed them thoroughly, and allowed them to ferment for few days.

After few days of keeping for fermentation, we measured the ph and we observed that-

For panchagavya-ph is 6.67 and for jeevamrut-ph is 6.89

Therefore, which is found to be the best suitable ph required for soil? Hence, we have achieved the best suitable ph for panchagavya and jeevamrut.

Therefore, we come up with a final result that there is a reduction in price by 5.14 INR/L for Panchagavya and 0.85 INR/L for Jeevamrut when compared to the traditional method of preparation of panchagavya and jeevamrut.

5.Discussions

Our research has major findings based on the review of relevant literature (from year 2000 to 2021) on various aspects of organic farming like definition, principles, proposed benefits (environmental, economic and social), present status in India, and its prospects are summarized:

1. Organic agriculture is a holistic production management system which promotes and enhances Agri-ecosystem health, including biodiversity, biological cycles, and soil biological activity

2. Principle of Health, Principle of Ecology, Principle of Fairness and Principles of Care, are the roots from which organic agriculture grows and develops.

3. Since organic farming keeps away with almost all synthetic inputs like chemical fertilizers, chemical pesticides and insecticides, and since `soil building' crop rotations are mandated, it shows a superior environmental performance per unit area than conventional agriculture

4. Organic management practices also provide an opportunity to improve soil fertility and reduce soil degradation. The use of biofertilizers plays an important role in maintaining long term soil fertility and sustainability.

5. Nutritional differences between organic and conventional produce appear minimal, but studies examining this have been limited by inadequate controls for the many subtle potential confounders, such as moisture, maturity of the product, and measurement technique. Apart from inputs, the nutritional level is also determined by various other factors like climate, quality of soil, availability of water cropping and processing techniques, etc.

6. Various studies prove that organic produce contains fewer pesticide residues than conventional produce, and consuming a diet of organic produce reduces human exposure to pesticides.

7. Rural areas may benefit from the creation of employment in labor-intensive organic agriculture and can also facilitate the participation of women who have less access to the formal credit market and often cannot purchase agricultural inputs.

8. From the economic point of view, organic agriculture has several benefits for farmers, including cheaper inputs, higher and more stable prices, and organization in farmer cooperatives. In an emerging country like India, sustainable agriculture can help in meeting twin challenges of food security and job creation it also helps in poverty reduction.

9. The increased cost of production during the time of transition from conventional farming to organic farming and the cost related to certification is a retarding factor for the adoption of this method of cultivation.

10. The organic share of total agricultural land is only 1.3 percent, but the percentage share is showing an increasing trend especially during last decade.

11. The demand for organic product is increasing both domestically and globally. There exists a huge untapped export potential for organic certified products.

6.Practical Implications

In our analysis of total cattle waste in India we highlight the possibility of organic farming across the nation by establishing a socio-commercial model that can result in revenue generation by combining organic and animal farming practices for agronomic and rural development.

1. By producing organic manure for modern farmers that have a short processing time, is more efficient and gives a high yield.
2. By providing qualities to manures such as Panchagavya and Jeevamrut.
3. By performing metabolic analysis and found various factors which lead less usage by farmers communities.
4. Reducing time by before it takes for Preparation time.
5. Building more manpower as Manual mixing is hard to handle.
6. Avoiding undesirable result is common in these processes and procedures using proper parameters.
7. Avoiding expels Odor (if not mixed properly).

Therefore, there is a need to develop technology and strategy for preparation of organic manure to overcome all mention problems. We need to develop a model where farms having electrically drive fermenters should be installed to produce organic manure in seven to ten days. Also,

1. By Promoting more usage of natural pesticides. Ensure the right soil cultivation at the right time. Keep and build good soil structure and fertility.
2. The short-term goal is to self-generate and self-maintain in a given environmental context. The long-term goal is to pass genome copies on to offspring, a goal that succeeds only if self-generation and self-maintenance succeed.
3. Conserving environment and natural resources, re-establishing ecological balance, encouraging sustainable agriculture, improving soil fertility, conserving flora and fauna, increasing genetic diversity, and putting an end to chemical pollution and toxic residues.
4. Organic production is an overall system of farm management and food production that aims at sustainable agriculture, high-quality products and the use of processes that do not harm neither the environment, or human, plant, or animal health and welfare.
5. No use of GMOs (genetically modified organisms), highly hazardous pesticides or HHPs, and synthetic fertilizers.
6. It also gives an idea for the Practice of crop rotation to replenish soil nutrients.
7. It also helps to Recycle all organic waste.
8. It is helpful in the control of pests, diseases, and weeds through biological methods.

Areas of future studies

Human resource management plays an important role in the agriculture, rural areas and represents one of the most complex issues in organic manure processing and agri-food companies when we talk about employment. Also, human resources management make agribusiness as well as organic manure processing firms successful and help you to make management as there are still only a few researchers that make a strong contribution to this area. Most of them focus on the macro-economic level, by exploring employment and unemployment in the area of agribusiness, but there is a small number of research that is based on cases of agribusiness firms, in which human resource management can be more explored in detail.

7.Conclusion

Due to increasing prices of chemical fertilizer and non-efficient role in long term to sustainable production, there is a need of application of organic manure including cow dung for enhancing maximum productivity in sustainable way with better soil health. It is a effective tools to improves physio-chemical and biological properties of the soil with higher yield of plants in sustained basis without deleting the fertility of soil. Cow dung is of similar importance due to its use as primary source of energy notably for cooking. Rural farmers are keen to use dung as a source of energy due to unavailability of other sources which affect the productivity.

Physio-chemical properties of Panchagavya revealed that they possess almost all the major nutrients, micronutrients and growth hormone (IAA & GA) required for crop growth. The predominance of fermentative microorganisms like yeast and lactobacillus might be due to the combined effect of low pH, milk products and the addition of jaggery/sugarcane juice as a substrate for their growth.

We also noticed contamination of organic matter with chemical pesticides, most likely via cattle fodder. Farms that have been rigorously using organic farming practices for the last many years also had a low level of chemical pesticides, this highlights the potential problems of obtaining residue-free farming practices altogether. Regardless, to have a clean green initiative, one will have to start from the baseline,i.e. organic cultivation and feeding of fodder crops in a chemical-free environment, thus obtaining organic-chemical-free cow dung and urine. Such practices, where livestock management and agriculture can result in improving the economic situation of poor farmers should be encouraged. Moreover, when farming communities come together in the form of cooperative societies to maintain livestock and produce organic matter in bulk; it can result in rural development and dramatically reduce to choose the use of synthetic fertilizers.

Acknowledgement

It gives us a great sense of pleasure to present the research article undertaken during B. Tech. Final Year. We owe a special debt of gratitude to Mrs. Kalpna Katiyar, Dr. Ambedkar Institute of Technology for Handicapped Kanpur, for his constant support and guidance throughout our work. Her sincerity, thoroughness and perseverance have been a constant source of inspiration for us. It is only his cognizance through his efforts that our endeavors have seen the light of the day.

We also do not like to miss the opportunity to acknowledge the contribution of all faculty members of the department for their kind assistance and cooperation during the development of our project. Last but not the least, we acknowledge our friends for their contribution to the completion of the thesis.

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