Chapter-1
Introduction

Farmers are almost depending on pesticides, chemical fertilizers, and growth regulators for enhancing crop productivity which leads to several serious effects on soil and environment health. To eliminate the harmful effects of the modern agriculture systems, there is need of an ecologically sound, viable, and sustainable farming system.

In India, using flowers to express respect is customary. These flowers will undoubtedly be replaced by new blooms that age a great deal of plant matter from shelters, homes, etc. There will undoubtedly be an estimated 80,000,000 tonnes of plant waste discharged into rivers in India. It accumulates due to contamination from kitchen waste in (Barad & Upadhyay, 2016; V. Gupta & Sapaliga, 2017; Maiti, n.d.; Maity, n.d.; Swain et al., 2006; Tiwari & Juneja, 2016). Eels and worms also move toward the spot as a result. Therefore, it is necessary to create a true and environmentally friendly cycle of floral waste decay. A rising number of people are becoming interested in agricultural products. Manures are generally thought to extend crop production. Compost use results in its biomagnifications in the established hierarchy. The demand for biocompost is therefore growing (Adhikari et al., 2009).

Frequently, worshippers offer these flowers in temples, but they are left unattended and thrown away as a result. India is a nation that loves to celebrate, and there are many events celebrated all year long, which over time contributes to the generation of solid garbage. This level of waste is frequently disregarded and calls for careful consideration. Because of our strong religious convictions, many of us choose to throw flowers and other worship-related items directly into water bodies rather than in the trash. In addition, these items are frequently dumped close to sacred trees without any practical means of disposal. For instance, Banaras, possibly the holiest city in the country, has no plans for getting rid of the massive volumes of trash that come from its Man temples. Every day, 3.5–4 tonnes of trash are left behind in the city of the temples (Masure & Patil, n.d.).

Variations in floral waste measurements exist between cities. India has a few urban areas that are renowned for their temples and pilgrimages. When such events, such as occasions and so on, occur, the amount of floral waste in the waste increases by nearly ten times. Jasmine, Marigold, Chrysanthemum, Hibiscus, Rose, and other prominent flowers are donated in temples; nevertheless, after being given to worshippers or used for decoration, these flowers are eventually dumped and return to nature unless another use is made for them(Jain, 2016).

They can be used to create some assets in order to prevent the negative effects that the withdrawal of these offers will have on people. Additionally, incense sticks made from herbal materials can be made using flower petals collected from temples in this manner. Incense sticks are made from flowers like genda, while roses are transformed into rose water. The Flowers can be combined with other herbal products, such as conventional colours, herbal colours, and so on, in addition to incense and rosewater (The Hindu, Jan., 2013). Another instance where the management of floral waste led to significant settlements is at Khwaja Moinuddin Chishti's Ajmer Sharif Dargah, where roughly 15 to 18 quintals of flowers were disposed of. Every day, flowers were given out and used to fill a well. The roses are being reused and also provide work for local women. The Dargah Committee has established a rose water refining factory on the outskirts of Ajmer with the assistance of the Central Institute of Medicinal and Aromatic Plant (CIMAP), Lucknow (Indian Express, May, 2010).

Degradation of floral waste is an extremely moderate procedure when contrasted with kitchen waste degradation. In this way there is a requirement for appropriate and eco-friendly process for flower waste treatment. The executives and usage of flower waste was completed in certain studies. One such model is the Kashi Vishwanath temple which draws greatest devotees all-round the year, particularly in the long stretch of Shravan. It has its own framework for removal of several kilograms of waste coming about because of offerings by devotees; the floral waste created in the temple is changed over into fertilizer (Gorasiya & Faldu, 2024). In this study we collect Indigenous Gir cow’s dung, saliva, skin flora and collected gaushala’s soil sample we try to isolate microbes from this samples which are capable to degrade floral waste and develop microbial consortium from screened microorganisms.

Cow dung is the undigested buildup of consumed food that herbivorous bovine animal species defecate. Cow faeces are a significant source of microbial diversity and are home to a variety of bacteria. 69.9% of India's population, according to The Hindu (2011), lives in rural areas, where cows (*Bos indicus*) are prevalent dairy animals and produce 9 to 15 kg of waste daily (Ayoola & Makinde, 2008). numerous microbes, including *Lactobacillus plantarum, Lactobacillus acidophilus, Bacillus subtilis, Enterococcus diacetylactis, Bifidobacterium,* and *yeast*, can be found in the lower stomach of cattle (usually *Saccharomyces cerevisiae*) After the soil decomposes multiple times and *actinomycetes,* microbes vanish. Our goal in doing this study is to identify, classify, and illustrate the microorganisms in cow excreta from the desi cow breed based on several morphological and biochemical factors, and to evaluate their value using a preliminary natural screening of microorganisms(Bélanger et al., 2015). The association between lignin defiling life structures and the breakdown of environmental pollutants was shown to be spread out in cow dung, which was actually shown to be rich in hydro-carbonolastic animals. They demonstrate how such smaller than expected living entities can be extracted from waste materials and are effective at corroding a variety of harmful compounds (Adebusoye et al., 2015).

Because they are the most potent degraders of unrefined petroleum in that environment and can be used in the bioremediation of oil-contaminated sites, certain unrefined petroleum degrading microorganisms can be isolated in large quantities from cow dung. Therefore, when produced and gathered in large numbers as microbial biomass, these microbial isolates from cow dung can be used alone or as a consortium; seeding through bio augmentation for the improvement of raw petroleum breakdown (Adeleke et al., 2015).

Cow dung, a common and easily accessible waste, has a variety of microorganisms with a remarkable capacity to break down benzene. This microbe needs high benzene concentrations nearby and multiplies when it is disconnected or working in a group. Our research facility level bioremediation system has successfully demonstrated that the consortium's products can be used at contemporary scales to reduce the amount of toxic benzene in the environment and assess its health hazard (Godambe & Fulekar, n.d.).

Cow dung contains a diverse range of microorganisms with variable characteristics. Utilizing the microbial flora in cow dung can help with all practical horticulture and vitality requirements. One of the world's bioresources that is widely available and is still largely underutilised is this one. Understanding the mechanisms that allow organisms found in cow dung to break down hydrocarbons can help with bioremediation of naturally occurring contaminations. The characteristics that lend themselves to bioremediation can be identified thanks to recent developments in logical analysis and techniques for full genome successions. The development of microbial catalysts and antibiotics is another stimulating area for future research. From this tiny bioresource, microbes can produce proteins that have broad applications in a variety of industries, including agribusiness, science, and biotechnology (K. K. Gupta et al., 2016).

It is possible to isolate microorganisms that produce cellulase from cow dung. The pure cellulases obtained here are suitable for all applications (Alam Khan et al., 2011). According to research, isolated bacterial strains can be used to prevent diseases caused by pathogenic strains. Therefore, cow dung serves as a purifier for all environmental losses and is a rich source of microbial flora that can be used as probiotics, live microbial food supplements that change the intestinal microbiota. Therefore, focused efforts must be made to identify and preserve all indigenous types of cattle for close-proximity, microbiological, and immunological examination of milk, urine, and compost with particular reference to their importance for horticulture, medicine, and food (Sadhu et al., 2014).

Biodynamic arrangements based on cow dung demonstrate that *Bacillus spp.* are in charge. This is an additional account of an encounter between *L. xylanilyticus* and *B. licheniformis* in biodynamic settings. The identified bacterial strains boosted the growth of maize plants by exhibiting traits that advance plant development, such as the production of IAA, the solubilization of phosphate, and danger to *R. bataticola*. The results provide a foundation for comprehending the beneficial effects of biodynamic arrangements and for communicating the challenges in contemporary biofertilizer and biocontrol operator creation (Pindi, 2012).

Teo & Teoh, 2013, Evaluations from cow dung collected in Kampar, Perak, Malaysia, five different isolates were taken out and purified using Nutrient Agar (NA) plates. Gram-staining, endospore staining, and microscopic evaluation were all done as part of the morphological examinations. Gram-negative isolates included K1 and K5, whereas Gram-positive disconnects included K2, K3, and K4. Endospore formation was an option for isolates K2 and K4. Utilizing the Kirby-Bauer test, the susceptibilities of five disengages to 17 different types of anti-microbials were determined. At least 35% of the anti-microbials that were tested had no effect on any individual detach. 11 different test critters with antibacterial exercises were evaluated. The antibacterial agent created by Seclude K4 stopped Escherichia coli from growing. 22 different types of chemicals were evaluated using enzymatic tests for proximity. Protease, lipase, and esterase lipase were all administered via seclusion.

Composting is thought of as an aerobic, thermophilic, microorganism-mediated, solid state fermentation process that transforms various natural materials into more stable entities that serve as the basis for humic compounds (Debertoldi et al., 1983; Paulin & O'Malley, 2008; Saranraj P, 2012). However, there are a number of naturally existing microbes that can transform waste materials into valuable resources, such as plant nutrients, and lower the C:N ratio to improve soil productivity. These microbes are also necessary to maintain supplement streams from one structure to the next and to prevent natural imbalance (Debertoldi et al., 1983).

Adegunloye et al., 2007 concluded that microorganisms, temperature, air circulation, dampness substance, and concoction arrangement of the organic waste materials can all boost the production of high-quality dull earthen-coloured compost. The early development of the composts was aided by the cow manure, which also increased the compost's beneficial components. The various organic materials employed in the composting process were fully utilised and converted to rich compost, making fertilising the soil an excellent waste-reusing process. Composting and its use generally help to increase soil nutrients and enhance certain soil characteristics, including pH, surface, soil aggregation, and chemical composition.

Since these deposits are generally efficiently degradable and have healthy and nutritious qualities, less compressible material with useful organising ability, such as pruning build-ups, wood chips, and straw (referred to as bulking materials), should always be added for a proper composting process. These substances can add porosity to the bulk and ensure appropriate oxygen entry for the action of high-impact microorganisms. With its ability to alter and cure the soil, compost can be used efficiently to restore degraded soils or maintain/increase soil fertility. To reduce creation costs and the negative consequences of farming activities by limiting the use of compost, pesticides, and fuel. To trap carbon into the soil, so reducing an increase in Earth's surface temperature. Compost, as balanced out organic matter, can be wisely used for the recovery of degraded soils and their ripeness re-establishment, carbon sequestration in the soil, and the decrease in the utilisation of chemical inputs (composts, pesticides, fuel), resulting in a reduction in production costs and detrimental ecological effects. Additionally, compost can be successfully used in other profitable (nursery) and outdoor activities (green territories, recuperation of waste dumps, cultivating, and so on.).

Information on the various microbial groups and their function during the process of bio-oxidation is required because composting is primarily a microbial activity. The migration of distinct microbial groups can be used to characterise each phase of the soil's composting process. One of the most popular methods for recycling is turning the biodegradable organic element of solid municipal garbage into fertiliser. It is a low-energy method that permits the removal of the organic portion of solid municipal garbage and slime, which combined represent the strongest quantitative component of denial. If properly managed, composting will provide a product that is clean, protected, and helpful for agriculture. Modern methods have been developed that quickly produce manure that is ideal for agricultural usage. In particular, knowledge of the microbiological aspects of composting has facilitated the development of the vast majority of factors that influence the process (Hassoon Ali et al., 2018).

Compost is the result of a controlled decomposition process in which successive generations of active smaller-scale animals separate and transform organic material into a variety of increasingly complex organic substances, many of which are loosely referred to as humus (Paulin & O'Malley, 2008).

Agnihotra is a process of purifying the atmosphere by using copper pyramid of a fixed size through a specifically prepared fire with dried cow dung cakes and putting some rice, ghee & kapur into the fire exactly at sunrise & sunset. During agnihotra a strong magnetic field & tremendous amount of energy is created which neutralizes negative energy & reinforces positive energies.

The fundamental Agnihotra (sanskrit: agni = fire, hotra = recuperating), is rehearsed in the beat of sunrise and sunset. A little fire is ready from dried cow dung and explained spread (ghee) in a copper pyramid. A few grains of whole rice are placed into the fire accompanied by reciting a mantra. The ash created by the fire is licensed with having mending properties. Add in water and showered onto plants, it is said to have fertilizing as well as plant safeguarding quality. Homa farming might be applied as a corresponding strategy along with common techniques for natural farming (Jina Devi et al., 2004).

To study the impact of Agnihotra Yagya on air microflora, several indoor experiments were conducted, to compare the effect of Yagya and that of non-Yagya. The results were very encouraging. In all the indoor experiments there was a significant reduction in the microbes especially the pathogens. The decrease on the day 3 in the four experiments has been recorded as 100%, 67%, 87% and 93% respectively in pathogens, which is impressive and supportive of the fact that Yagya renders the atmosphere bacteriostatic and it kills the harmful microbes in the atmosphere.

Homa is an ancient Vedic farming technique and is used in organic farming. Homa is a well-established science and is as old as creation and come from "Vedas"; which is the ancient most body of knowledge known to human. The nutrients that pollution removes from our environment are replaced by homa. As per Vruksha Ayurveda atmosphere is the biggest single factor that contributes about 75% percent nutrition to plants (Ulrich & Johnson, n.d.). Homa farming might be applied as a corresponding strategy along with common techniques for natural farming. The performance of homa ash (agnihotra ash) can be used in organic farming which can add some potential benefits in the development of plants (Namrata et al., 2012).

Most farming practises focus solely on the soil and do not take the environment into consideration. Homa farming, on the other hand, operates under the premise that by purifying, repairing, and reviving the environment, all life within it is given new vitality.

The atmosphere is infused with ghee, nutrition, and prana during the yagna process, allowing the plants to breathe more deeply and absorb more nutrients from the air. The pollutants are removed from the atmosphere and the air. Yagnas have been shown to deliver rain and raise the atmospheric moisture content. Earthworms and other helpful microbes multiply in the soil, enhancing it with vital nutrients and vitality.

The plants are guarded against pests and other hazardous illnesses by the yagna fumes and application with homa ash water. Homa farming has been demonstrated to produce plants with more nutritional value, a longer shelf life, greater yields, and stronger resilience to disease and pests than organic farming.

Homa nourishes the very source of life, the consciousness in all life forms in its atmosphere, which leads to harmony and their overall well-being and growth, much like yoga nourishes an individual's spirit and consciousness, which leads to growth in all dimensions - physical, mental, vital, emotional, and cognitive levels. Therefore, homa farming has many more advantages than even organic farming.

The simplest type of homa farming is performing a yagna, typically an Agnihotra yagna, which entails burning cakes made of cow dung, ghee, and unpolished rice at sunrise and dusk along with the Om Trayambak Homa.

A geometric arrangement of 10 Agnihotra pyramids can energise up to 200 acres of land. Multiple farmers can use a single configuration of this resonance technology. The Agnihotra hut, where the Agnihotra yagna will be performed, is typically constructed using natural materials in the farm's centre. A somewhat larger tent for Om Trayambak Homa rituals is also constructed close by. Every day at sunrise and sunset, the Agnihotra hut performs a yagna, and no other sound is made there.

Homa farming is an Ayurvedic practise that Param Sadguru Shree Gajanan Maharaj of Akkalkot, Maharashtra, and his student Vasant Paranjpe ji popularised in the 20th century. Homa farming is being practised by farmers in a number of nations, including the United States, Australia, Spain, Poland, Germany, Peru, Chile, Venezuela, and Colombia. At the University of Agricultural Sciences in Dharwad, Karnataka, and CSK Himachal Pradesh Agriculture University in Palampur, India, groundbreaking research on homa farming is being done.

Treating the soil, plants with Agnihotra ash

Agnihotra ash in water at a concentration of 1.25g/L is held for 3 days. This solution, which is sprayed on the plants, helps the plants develop and thrive while acting as a natural deterrent for pesky pests. As a natural fertiliser, agnihotra ash is also incorporated into the soil. The essential element that promotes soil and plant growth in numerous ways is ash. In addition, a paste made of Agnihotra ash, clay, and water is used to treat pest or infection- or branch-cutting-related lesions on plants. Agnihotra ash has a fast-healing effect on plants.

The following advantages of employing Agnihotra ash in soil over organic and conventional farming have been discovered by researchers. It's also interesting to note that several studies comparing the efficacy of Agnihotra ash with regular ash (ash only produced by fire without chanting the mantras) revealed that Agnihotra ash performed noticeably better:

Balanced pH: It has been shown that agnihotra ash can correct both acidic and basic pH imbalances in soil. This is especially helpful in regions where cultivation is difficult owing to a high pH imbalance and even using too many pesticides does not ensure a yield. Agnihotra ash was employed in two separate, highly acidic (pH = 4.4) and highly alkaline (pH = 9.86) farms, and just three months later, the pH of the soil had reached 7.2 and 7.67, respectively.

Higher nutrient absorption, increased microbial content: In addition to numerous other nutrients (known as micronutrients) in modest amounts, plants require three main nutrients (referred to as macronutrients): nitrogen, phosphorus, and potassium (NPK). The amount of phosphorus that plants could absorb, the nitrogen-fixing nodes in the roots, the growth of healthy bacteria, and the suppression of fungal growth were all improved by adding Agnihotra ash to the soil.

Benefits of Homa Farming

Protection from pests and diseases: According to a study by the Agricultural University in Dharwad, Karnataka, Homa treatments for tomato, okra, cabbage, and soyabeans reduced pests and illnesses by 20–40% compared to organic and conventional farming practises. Numerous homa farmers have stated that fungal infections have completely cleared up in their crops.

Higher nutrition value and yield in food: A number of studies (see sources) have shown that the soil is being depleted due to the excessive use of chemical fertilisers, and our food's average nutritional value has been continuously falling, with 10 to 25 percent less iron, zinc, protein, calcium, and vitamin C. The reduction affects phytonutrients as well as vitamins and minerals. These are substances made by plants that are anti-inflammatory, antioxidant, and helpful in the battle against fungus and illnesses. Our bodies are now more vulnerable to lifestyle-related ailments like osteoporosis, diabetes, hypertension, and ageing as a result of the lack of nutrients in our diets. The family's elders complain that the dish lacks "taste, spirit, and energy." To strengthen our immunity and meet the nutritional needs, there has been a trend toward greater reliance on medications and dietary supplements.

Two or three reports from India, Peru, Venezuela, the United States and Austria, some of them including logical documentation, give record of the gainful impacts of Agnihotra ash and floral waste biocompost on plant germination, improvement, wellbeing and pest resistant, as well as on yield and product quality with respect to soil quality, a better water holding capacity, an expansion in sum and solvency (plant accessibility) of macro nutrients and minor components and a feeling of worm movement are proposed as an immediate consequence of Agnihotra ash and floral waste biocompost treatment. The referred to reports demonstrate to areas of strength for an Agnihotra ash and floral waste biocompost for further developing plant execution in an ecologically sound way. Nonetheless, an essential for a more extensive acknowledgment of this strategy is a reasonable logical documentation in view of replicable and precise tests. While the majority of the above referred to impacts of Agnihotra ash and floral waste biocompost treatment have not yet been deductively made sense of or demonstrated, first investigations on the subject of supplement dissolvability with two

Colorado soils uncovered an expansion in P solvency when the soil were treated with Agnihotra ash and floral waste biocompost. The point of this review was to test on the off chance that the outcomes detailed by Lai (no year) could be replicated with a German rural soil under controlled research centre circumstances (Bélanger et al., 2015; R et al., n.d.).

In this work we used central composite design (CCD) for optimizing the effect of floral waste biocompost and Agnihotra ash on plant and soil An embedded factorial or fractional factorial design with centre points exists in a Box-Wilson Central Composite Design, also known as a "central composite design," which is supplemented with a collection of "star points" that enable curvature estimate. The distance between the design space's centre and a star point is || > 1 if the distance between the centre and a factorial point is 1 unit for each factor. The exact amount of relies on the number of components involved and some desired design features.