



## RESEARCH ARTICLE

### BIOGAS FACTORIES AND CARCINOGENICITY: A NEW ARENA OF APPLIED RESEARCH

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#### ABSTRACT

Biogas is basically methane produced from natural digester process in a biogas plant. This is an anaerobic mechanism which involves the use of certain microorganisms like fungus, bacteria, yeast etc which feed upon the wet, thick liquid organic matter from the plant or animal source. The most desired sources are like cow dung, poultry feed, press mud from the sugar factories, plant straw or husk from vegetative sources like rice, Napier grass, millets or other grasses from the botanical family Graminae. The dry grass or husk is chopped, crushed, thrown into a coarse powder and then made into a semi thick running paste by a giant agitator wheel and then pushed into the dark, anaerobic chambers where the above material is digested upon by various fungi, yeast or other microorganisms and various gasses are released like methane, hydrogen sulphide, carbon dioxide, carbon monoxide, ammonia etc which are further passed through respective purification processes and methane is then packed in containers as compressed biogas and other gasses are also separated and packed for various purposes known in the field. This process is claimed to be clean and green operation and so is being promoted on a massive scale but there certainly are two sides of a coin and recently many drawbacks of this clean process have started to surface. The carcinogenic affect in humans is one such unwelcome outcome and the reproductive inefficiency is another. The various aspects are discussed and debated in this write up.

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## INTRODUCTION

Energy is the food of life. Life thrives on it. We may depend upon food but it is also converted into energy in the biological mechanisms that go on and on in the bodies of various organisms. Of course, Sun is the basic source of all energy on Earth. There are also fossil fuels as well as other sources of energy available like hydro or nuclear power projects but the hunger of man for energy is insatiable. The most recent entrant on the scene is biogas which is produced in biogas factories which are being installed in big numbers in many parts of the world. It is true that this is a new beginning and we still do not know much about these factories except about their benefits but who knows that in the time to come, there will be preponderant talk everywhere of the evil affects of them?. Biogas factories are being promoted on a war scale (Business Standard, 2024). They are claimed to be flagship carriers of another agro based great revolution and they are being pushed at a speed unmatched even in the wildest of imaginations by the Punjab government under the shelter and support from Union Government. The slogan of this new government initiative is "clean energy, green energy". The people of Punjab have become suspicious of this new avatar of clean and green energy because they have already suffered due to the

hazardous fallouts (Nelson *et al*, 2019) from the once much touted "Green Revolution". So people are worried and not in a mood to believe about the intentions of government because certain factories which are already running in the state; have spread heavy nasty air pollution and foul smell as well as littered filth, garbage and dirty stinky water in and around the areas where they are installed. An alarming health emergency situation has arisen in these once neat and beautiful localities and people of these villages are worst affected. The stinky odor emanating from these factories as well from the dirty water pits formed by foul smelling liquid discharge; is difficult for the residents of these areas to stand. The people are complaining of skin allergies, breathing problems, suffocation, gas balloon explosion emergencies, soil alkalization, swarms of flies and mosquitoes, diseases like malaria, typhoid, cholera etc and also accidents arising from the slippery discharge spillage from waste water carrier tankers of these factories and lots more. Furthermore, these factories are supposed to pose bigger health problems like cancer and hormonal disruptions in future generations. The most startling examples are in the village of Binzo in Hoshiarpur district and in the village of Ghungrani Rajputan in Ludhiana district. These factories are already running and spreading nasty pollution.

It is a fact that people of Binzo village initially waged a struggle against this factory but they gave up because they were no match against the unlimited power and might of the state standing in collusion with the factory owners but the people of Ghungrani are still struggling along with other village committees where government has just recently proposed new factories and these owners have started the primary construction work. The government is already in the dialogue process with villagers and a positive outcome is expected. As of now the clean image of this once proclaiming natural and serene energy has gotten tarnished to an extent at least in the eyes of people.

**Anaerobic digestion:** Anaerobic digestion (AD) is the process employed to generate biogas. It is performed in an atmosphere of scarce oxygen supply in the moist and dark conditions. These conditions are ideal for growth of certain fungi, bacteria, yeast etc. The organic matter of biological origin is eaten upon by the above mentioned organisms and is metabolized to varying extent depending upon the availability of optimum conditions. The optimum conditions are a temperature range of 35-40°C and very low oxygen availability and total dark conditions in a moist environment. This generates energy and is an exothermic process plus it releases gasses like methane, hydrogen sulphide, ammonia, carbon monoxide, carbon dioxide etc. Of them methane is the preferred gas and is collected. The other gasses are also purified and used for different purposes.

Anaerobic digestion is a detailed process (Meegoda *et al*, 2018) and is completed in many stages of which hydrolysis is the first one which is followed by other stages of acidogenesis, acetogenesis and methanogenesis in the end. The process starts from the complex organic matter which includes carbohydrates, proteins, fats and other related material. As the process follows, we see generation of amino acids, fatty acids, volatile acids, sugars etc. Even alcohols with short and long chain molecules are formed. In fact it is a complex mechanism and lots of biological processes are taking place simultaneously. We all know of fossil fuels. It is a theory that many jungles, fauna and flora got buried deep down due to tectonic movements of earth strata and the organic material therein got processed in an anaerobic, wet and dark conditions just like the one explained in above paragraph. So, there can be a correlation of sorts that what happened crores of years back when layers and layers of thick plantations got buried deep down and produced chemicals like methane, ethane, propane, butane, pentane, hexane, heptane or octane etc along with producing chemicals like o-xylene, naphthalene; can still be taking place however to a minuscule level in the biogas plants and producing traces of these compounds which when oxidized in little acidic conditions and heat can be converted into phthalic acid which upon reaction with alkanols that are also produced during the process of anaerobic digestion; can produce alkyl phthalates like DBP (dibutyl phthalate), DEHP (diethyl hexyl phthalate), DHP (dihexyl phthalate), BBP (benzyl butyl phthalate) and so on.

**Parali (rice straw) is the material for biogas generation:** India is a country which saw the implementation of Green Revolution on a massive scale. The government in a maneuver to promote green revolution and ensure food safety for the fast growing population of India not only announced but also ensured the provision of minimum, consistent support prices for paddy and wheat.

The end result was that maximum number of farmers shifted to this crop cycle of rice (*Oryza sativa*) and wheat (Sarkar *et al*, 2008) especially in the fertile irrigation belt of India. The other traditional crops were the immediate causality and just disappeared from the scene or got diminished to minuscule levels. Now there was a problem that rice straw is being produced in abundant quantity and farmers have no option other than to burn it in fields after harvesting of crop. So, farm fires became a permanent annual event that contributed greatly to the atmospheric pollution. The government was alarmed (Hindustan Times, 2023) and even the Honorable Supreme Court took notice of it and asked the government to stop this. Then on a fruitful day, the government came up with the brilliant idea to start biogas plants in the rice growing belt of India and announced heavy subsidies on the establishment of biogas factories. Numerous biogas factories sprang up and many are still in the process of getting installed. This was a brilliant idea for the efficient disposal of parali as well as a viable alternative for the energy deficit nation. So, the idea appealed to everyone.

One more point to be noted here is that parali is purely of organic origin and after the gas is processed out of it and remaining matter is used as a biological fertilizer purposes, nothing remains in particular. So, there is efficient source of energy as well as bio-fertilizer desperately needed for the farming purposes.

**The worms in parali:** Of course parali is purely organic and is hundred percent biodegradable but one thing should be noted that we are living in an era of great Green Revolution. This is laden with the heavy use of insecticides, pesticides, herbicides, chemical fertilizers etc. As once was commented by great legend in agriculture, Norman Borlaug, "It is not possible to feed 6.6 billion people without chemical fertilizers. So, farming without chemical fertilizers is impossible. Just forget it. The game is over". The parali is biodegradable but these insecticides, pesticides, herbicides, chemical fertilizers are not. They do not get metabolized during the usual anaerobic process of the biogas plants. They are retained in their original chemical forms to greater levels. In fact, they often lead to a situation of chronic toxicity (Pathak, 2022). They are transferred to the disposal liquid after gas is harvested and even after the separation of bio-fertilizer cakes from this thick liquid slurry. They are mostly collected in the dirty, stinky, alkaline watery discharge that remains after the entire operation. Even when a portion of this watery discharge is re-circulated in the biogas generation process; the bigger chunk of it is spilled out as waste water. So, a new twist is seen here that parali is no more biodegradable. At least the harmful insecticides, pesticides, herbicides and fertilizers etc in it are not. The new entry in this band of evil is of the phthalates. And they all are very well known for their bad reputation.

**Disposal of the dirty waste water:** This is the biggest bane of this technology. In fact this is the question that farmers and residents of the villages where these factories are established or in the process of installation; are asking. Where will the surplus dirty water (Grubel, 2013) go? It will be as the practice at present is that it is filled in big tankers and being disposed in agriculture lands of farmers but nowadays farmers have stopped the disposal of it in their fields as they have come to know of the harmful side affects of it on their crops. This dirty water will be collected in bigger disposal sewage pits. The size of such pits will extend to multiples of acres.

The deep, stinky dirty water is full of harmful chemicals; many of them have hazardous health records. This is a great problem that has arisen from these new avatars of clean and green energy namely the biogas plants.

**The cancer concern:** There is a lot of scientific literature available on the cancerous potential of insecticides, pesticides, herbicides and phthalates. Pesticides and insecticides are well known for their bad reputation in this regard and recent entry is also of the phthalates and lot of information has just recently started to pour of their magnificent capability to cause cancer in humans and animals as well. The herbicides also carry a notorious tag on their name but there is also literature available which does not connect them directly to the cancer preponderance in humans but in spite of this, various governments (Daniel, 2015; The Guardian, 2016) have banned the use of many of them in their national jurisdictions.

**Insecticides, pesticides, chemical fertilizers are cancerous: A proven fact:** There is lot of research work already been completed and public opinion created that pesticides, insecticides, herbicides and chemical fertilizers are not only poisonous (Jolodar *et al*, 2012; Salazar and Rand, 2020) but they are also carcinogenic and hazardous (Gil *et al*, 2012) to the body tissues and internal organs (Panis and Lamos, 2024; Patil, 2014).

Urea is also connected to cancer incidence (Ward, 2008). It is also a fact that they are used in lavish quantities in the agriculture process in Punjab and Haryana. Now that they have collected in such high quantities in the agricultural soil bed that they are real big health concern and cause for multi organ systems failures and mysterious ailments due to prolonged and systemic poisoning of humans in this once prosperous belt of land. Farmers are no longer a healthy tribe here and so is the condition of other residents feeding on food grown by use of these chemicals on crops in these areas.

**Phthalates are cancerous:** There is too much research data pouring in and pouring very fast that phthalates are carcinogenic (Adhern *et al*, 2019; Adhern *et al*, 2022; Khan *et al*, 2022; Wang *et al*, 2021; Yang *et al*, 2024). Phthalates may be of natural origin in plants especially in rice (Minh *et al*, 2019; Rosado *et al*, 2022). So, phthalates are compounds of interest to be watched very carefully as regards the cancer angle with respect to human health. There is a new twist to the problem. The phthalates have started to appear in aquatic cultures (Prevaric *et al*, 2021; Rajput *et al*, 2022 and Zolfaghari, 2014). So, the sewage pits of biogas plants are definitely the new arena where lot of work will definitely be expected to be focused and reported in future.

**The combo effect of insecticides and phthalates:** Insecticides, herbicides and phthalates have one thing in common that they are all petrochemical derivatives. So, they exhibit certain properties that are common to them. They are soluble in organic solvents as well as in water. They get accumulated in living systems and go on accumulating till they cross the limits of all danger levels. In fact, they have already accumulated in quantities far more in excess to the conceivable limits. They are a real health threat. People are already suffering from the individual singular onslaughts of these respective chemicals but the combo attack of all of them is an even bigger threat. It is a matter of grave concern.

**Phthalates in biogas synthesis with parali:** Parali means nothing but rice straw. Phthalates in parali and biogas plant process can come from many sources:

**Fertilizers:** Since green revolution happened in agriculture, new crops popularly known as hybrid dwarfs were introduced which are highly dependant on chemical fertilizers. There are mainly three types of chemical fertilizers commonly used; urea, di-ammonium phosphate and NPK. These three fertilizers combined together form the bulk of chemical fertilizers i.e. plus 80%. All these fertilizers are made from ammonia which in turn is prepared from atmospheric nitrogen and cheap hydrogen obtained from natural gas. Natural gas is a petrochemical of natural origin descended from degenerated biological stock of plants or animals buried deep down by earthquakes or tectonic changes. There are other petrochemicals as well.

Apart from natural gas, petrol also known as "octane" is another petrochemical along with ethane, propane, hexane etc. Of course there are other petrochemicals available with them like o-xylene, naphtha, benzene, phthalates, solvents, volatile oils, polymers etc. When this natural gas is taken for the manufacture of ammonia, it naturally takes traces of these chemicals as impurities along with it. These impurities form a part and parcel of the resultant chemical bulk that is prepared from the use of this gas. So, the resultant ammonium nitrate or urea or whatever chemical fertilizer is prepared from this gas source, gets contaminated with these phthalates or xylenes or naphtha compounds etc. The point to be noted here is that these xylenes or naphtha compounds can easily get converted to phthalic acid under various conditions of temperature, pressure or catalytic nature. This phthalic acid can undergo an easy process of esterification with various alkyl or aromatic alcohols giving rise to a variety of alkyl or butyl phthalates under different conditions.

**From plasticizer source:** Another name for these phthalates is plasticizers. These plasticizers are used in plastic industry to give shape, texture or molding flow. Since a biogas factory will definitely employ lot of corrosion free piping, sprays, antitrust equipments, coatings and a lot more things made from known phthalate origin. The bailing system also employs plastic strapping for tying the knots of the parali bails. These products will slowly keep releasing these plasticizers used in the manufacture of these equipments or pipes into the surrounding environment of the digesting material of biogas plant. When the operations of the general biogas production are over and the gas has already been harvested and even the solid organic manure is also gotten separated; the resultant dirty water which remains, contains lot of phthalates that have gotten released from the plastic, resinous or paint source of the various piping systems and containers that store and conduit these gasses and solutions under conditions which include high temperature and pressure also. So, the contamination of the dirty waste water gets happened with phthalates.

**From the digesting process:** It is a known fact that anaerobic digestion is a lengthy and thorough process that is a series of various metabolic processes going side by side, alongside one another. Many fatty acids, ketonic acids, alcohols, aldehydes, anhydrides and many more products get formed as a continuous process and get converted into one another in the different stages of digestion in a biogas plant. The aromatic compounds if present are converted into phthalates by

processes like simple oxidation in an environment of the presence of sulphuric acid which is natural descendant from the hydrogen sulphide that is formed as a byproduct from the process of production of biogas. Even fatty acids can be converted into phthalates under suitable conditions. So, there are various sources that result in the production of phthalates in a biogas plant.

**Plastic garbage:** A factory is a big premise. It may contain a facility for the discharge of thousands of liters of dirty wastewater which may be stored in big ponds; either cemented or non-cemented. Such a pond or sewage pit as it is conveniently called may be spread in many acres. Suppose few disposal automobile tyres are just discarded or happen to be disposed off into such a foul smelling mega pond. It will lay immersed in it and even a watchman will not venture noticing. It will continue releasing lot of phthalates into dirty water which is already contaminated with organic garbage. The plasticizer contamination is in fact a medical pollution. Even resins, paints, plastic pipes, polythenes, flex materials etc can also be left immersed in such sparsely watched dirty ponds.

#### **Volatile fatty acids: The game changers**

It is true that volatile fatty acids occur in nature. Rice straw (*Oryza sativa*) contains fatty acids in quantities approx 6400 mg/kg, 1600 mg/kg of free sterols, 1380 mg/kg of sterol glucosides, 1150mg/kg of fatty alcohols, 1140mg/kg of triglycerides along with wax esters, sterol ketones, monoglycerides etc (Minh *et al* 2019; Rosado *et al*, 2022).

Similarly the AD process in a biogas plant produces fatty acids. These fatty acids are collected to produce a variety of chemicals like bio plastic, biogas, bio hydrogen, bio diesel, bio electricity etc. This is due to the fact that these chemicals can act precursor molecules for synthesis of bio-plastics, bio diesel etc because they contain the basic chemical skeletal structure which under certain given conditions can be converted into aromatic or plastic molecules.

**The percolation process:** Percolation is a term which when explained in medical sciences tells about a mechanism where active constituents of a particular pharmacologically important chemical are extracted in a way that they continuously are dissolved, absorbed and then received and gathered in a container placed vertically downwards by a solvent preferably the water and the process lingers on for a prolonged period of time. Here in case of the biogas plants, big sewage pits or disposal dirty water tanks are created by a process that is an inherent part and parcel of the standard gas producing operation.

The various compounds of petrochemical origin get accumulated in the above said sewage tanks and go in increasing in concentration day by day by a continuous process till a limit which is much above the tolerable diffusion coefficient levels. The said chemicals start to ooze out to the outlet connection solutions which are nothing but the extensions to the ground water underneath. The process employs the general laws of porosity and diffusion mechanisms side by side. The force of gravity also plays a part and the high density (insecticides, phthalates, fertilizers etc) liquid starts to shed its superior density content to the one of the lower density (or zero density at first) by a natural process.

The water beds down there start to get contaminated and when they are sufficiently done so, start in turn to pollute other water beds nearby. Slowly the entire ground water is polluted with toxic limits of the poisonous and cancerous compounds. The percolation process is a continuous process till the feeding liquid stock is totally dried and exhausted. The ground water once polluted with highly toxic materials starts to cause its side affects. The clean energy and green energy slogan of the biogas plants gets busted with a destructive outcome.

#### **Ground water contamination with carcinogens:**

There is no need to mention that as the necessary outcome of Green Revolution, rice straw contains excessive quantities of insecticides, pesticides, herbicides and phthalates etc. This parali is digested into a thick pasty liquid and then after biogas is processed and the solid material separated; the remaining dirty water contains high concentrations of cancerous chemicals. The cemented flooring of the dirty water pits does not stand very long the action of reactive corrosive liquids and gives way. The sewage pits turn into sort of raw muddy ponds. Then there is direct seeping of this dirty contaminated water to the ground water below. Now the rules of science start their play and the differential diffusion coefficients of these poisonous chemicals guide their flow to the uncontaminated ground water below. Slowly, the ground water starts to catch up with the concentration levels of the carcinogens over ground. Since the percolation from such ponds is a continuous process and over a period of many years from the start, the ground water gets sufficiently contaminated so that it is now able to pose a continuous health threat to act the causative agent for diseases like cancer and hormonal disruptions to the population that is dependant for their usual water supply on this ground water source. Once the ground water has become the hotbed of diseases like cancer and hormonal disruptions, the game is as good as over.

**Sewage pits and phthalates: Strong connection:** The sewage pits have a very enduring connection with the occurrence of phthalates in them (Anne, 2021). Even village ponds are no exceptions (Rajput, 2022). There is very strong ground for the phthalates to accumulate in waste water pits even of sugar factories (Choudhury *et al*, 2018; Malik, 2019; Rahim and Mustafa, 2021). There are countless and obvious sources for the contamination of these sewage pits with phthalates. The phthalates can slip in them from waste plastic source, from disposal bottles, polythenes, tyres, plastic pipes, paints, resins etc. There are thousands of methodologies present for their entry into these sewage tanks. The biogas sewage pits are no exception. Hence, they are dangerous.

**The alternatives:** Of course parali is an integral part of these days' intensive farming model advocated by government and agricultural universities but going the biogas way and then plaguing the mankind with innumerable disease and suffering is not a humanitarian choice. Sardar Swaran Singh Bio Gas Energy Institute at Kapurthala, Punjab has come up with brilliant ideas on how to dispose off this additional parali baggage and has devised very innovative techniques like developing of parali pallets or fuel bricks which provide a better way out for this energy deficient state and also can set an example for the remaining nation. It is a fact that till now, nearly 70% of entire electricity generation in India is dependent on thermal coal. So, these parali pellets can play a very efficient and viable alternative to the fossil fuel. Even brick kilns which are abundant in this part of the country can

be designed in a way with little technical changes that they can use this alternative fuel. Similar other alternatives can be conceived and designed by experts in the field for more efficient disposal of parali.

**Hormonal disruptions: An even bigger threat:** This was explained by experts in the field that phthalates and insecticides etc act carcinogenic in a way that they act mimics of hormones like estradiol and also that these chemicals have a tendency to interfere in the usual DNA structures (Adhern *et al*, 2019; Khan *et al*, 2022; Panis and Lamos, 2024). Khan *et al* discussed comprehensively about the lengthy and elaborative process by which these chemicals act hormonal disruptors and affect the performance of selective genes on the giant DNA molecules and this selective depression or modification of genes results in devastating outcomes like cancer and hormonal disruptions. Anne (2021) also pointed to cancer incidence by way of hormonal disruptions. Hormonal disruptions are in a way even bigger problem. They once happened, act suppressive of sex organs development in adolescents. The sex organs do not get fully developed. These children when they are grown ups, will not be able to perform fully well the sexual task to produce further progenies. They will become sterile and impotent. Even if their sex organs are functional, they are not fruitful to produce viable gametes; ovum and sperms and the end result will be the situation of childlessness in future generations. This in itself is a bigger problem. We may call that it is in a way even bigger health criterion than cancer because people also desperately want to have babies and they want healthy and viable ones as well.

**Cancer and childlessness: Social scourge:** Imagine a situation in human society where a significant section of populace is infested with cancer. We may call it a cancer society? If a larger proportion of population is without offsprings. Such a childless society will be like a barren land without joy and happiness. Where flowers do not bloom and children do not get born; such a society is surely tasteless and colorless. Even if a section of society, say 10% is without progenies that they yearn to have; can not be called a happy society. We can just imagine the tag of childlessness on such couples especially women. Anybody who has even a minuscule knowledge of the social thinking and mindset of our people is certainly well aware of the social stigma and plight of such couples.

**Hazards of biogas plants:** There is lot of scientific literature available on the hazardous value of biogas plants. A biogas plant produces primarily five gasses. The methane is produced in large volume. It may be up to 60-65% on a higher side and may be 35-40% on the lower end. Other gasses are hydrogen sulphide, ammonia, carbon dioxide and carbon monoxide. Methane is used as fuel and is purified and packed for this purpose. Of the other gasses, hydrogen sulphide is a known killer. It is the third largest lethal gas in USA as per the official records. World famous Ludhiana gas tragedy (Times of India, 2023) which killed eleven persons in the Giaspura locality of Ludhiana was also caused by hydrogen sulphide according to government authorities. Out of the remaining gasses, ammonia also has a killer capacity. Carbon dioxide can cause asphyxiation and death if a person is exposed to it over prolonged period. The last gas, carbon monoxide is known toxic. It is easily miscible with blood and produces deep sleep which leads to coma and even dealth. There was a famous Minnesota episode at Ramsey County (Business Standard,

2021) where seven persons from a family died when they had employed a low burning coal furnace to keep their room hot during a cold December night in the winter of 2021.

**Biogas accidents:** Biogas energy may be a good option but its history is replete with numerous accidents and loss of lives and materials. The world famous Oxfordshire biogas tragedy was an act not of human or instrumental error but it was caused when a lightening hit the factory (BBC, 2023). Hegazy *et al* (2024) has analyzed 75 biogas accidents globally. In a big tragedy in Texas, 18,000 cows died in biogas explosion (The Texas Tribune, 2023). There are numerous other episodes as well.

**The cancer load:** The cancer load is already on the exceeding in Punjab which is being called as the cancer capital of India. It is estimated that it is excessive if the number is 100 cases out of a population of one hundred thousands. That is one out of a thousand living humans on an average. The cancer load is definitely more than this in many districts of Punjab except three districts namely Gurdaspur, Tarantaran and Nawan Shaher. It should be noted that Punjab has a total of 27 districts and a cancer load of limits exceeding from the acceptable measure in 24 districts out of a total of 27 ones, is in a way too much from all accounts. In some districts like Muktsar, it is even more. The national cancer load of India is also increasing day by day and worrisome data is pouring in from states like Maharashtra, Kerala, Uttar Pradesh and even from north eastern states. So, it is not a wise step to put more weight on the already worsened cancer situation in India.

**Scientific history of cancer connection of biogas plants:** There is no scientific history of the cancer connection of biogas plants as such. But indirectly the various peripherals attached with this technology have the most ill famous components in cancer history. It is true that the question has not been discussed anywhere even in the wildest of thoughts because no one however off-route or imaginative he may be; cannot venture too haphazard to conceive that a proclaiming green and clean technology can be so wicked and merciless that it will laden the coming generations with deadly burden of cancer. The question here to note is that whenever a new technology comes, it comes with a motive and lofty objectives only. The most startling example is of the dichloro-diphenyl-tetrachloro ethane (DDT). It was a great savior during the times just before the World War II and also during and after that period and the inventor, Paul Muller was also conferred upon with the most prestigious honor on earth till date, the great Nobel Prize in Medicine in the year 1948. But we all know that in today's date, it is a banned chemical everywhere in the world. When a new happening happens, we all usually welcome it with cheers, but as time passes, many dark sides of it start to appear and often they are extremely depressing and gloomy. Another example is of the great Green Revolution. It was touted, popularized and implemented the world over as a great savior; the ultimate in human benefit but as time passed, it laid our agricultural lands with exceedingly heavy amounts of fertilizers, insecticides, pesticides and herbicides etc; the known side effects of them are just well known. The world afterwards became witness to a cancer revolution rather than a green revolution. The nuclear energy is also another example in this direction. It was also touted as the clean and pollution free energy at a time and was implemented everywhere but in today's date, we all know that it is one of the dirtiest energies and it even damages the DNA of living organisms; both plants

and animals and is very devastating and anti nature too. So, the bio gas plants of today may have a darker angle; is also a point to debate. The green energy tag of biogas plants based on parali is expected to carry the equivalent weight only of the clean image of the material and essence of parali itself. If parali is infested with heavy doses of insecticides, pesticides, herbicides and fertilizers, then this tag will not travel farther and thanks to the credentials of great Green Revolution, this tag is already busted because we know of the high use of these harmful chemicals in the cultivation of paddy crop. So, a process involving parali at the centre of it can not come out clean and stain free and so is the process of the generation of biogas involving parali. It is bound to spread usual nuisance and mishappenings already associated with all of these ill famous chemicals. So, the end result is bound to emerge that problems are sure to happen with an operation connected with the use of parali as the material of an industrial process; may be it is the generation of biogas. So, lot of hazards will emerge one by one and people will be shocked to know of these destructive outcomes. This will create layer after layer of the scientific history of the drawbacks of biogas synthesis with this. It is only a matter of time when this happens. So, we can sit in wait anticipating to the time when heaps and heaps of research projects will reveal all this. People of now have a right to demand that they may be heard on a point that a new technology about whose side affects no body knows as of now, should not be applied on such a massive scale when so many lives can be put to danger due to this unwisely endeavor. Therefore, let's wait a while. Surely, it will create a scientific history of its own in the time to come.

## CONCLUSION

Human health is the most primary objective concerning governments and cancer is the deadliest disease. Even its name strikes fear in the minds of people. So, if there is even the slightest of a chance for cancer to happen, it should be taken vary seriously. Biogas generation is a very good idea but not at the cost of loss of lives. Impotency is another criterion and children and grandchildren are dearer to all but one. So, any incidence of medical interest that may induce sterility and childlessness in couples should not be tolerated. The biogas plants are potential bigger threats on both these fronts. The people of an area, anywhere in the world would get agitated by the implementation of such a technology on their land once they come to know of its fallouts. So, before the people start opposing the establishment of such installations in their respective areas, it becomes the utmost duty of administration not to allow such biogas plants in and around human inhabited areas. The case scenario may be different in uninhabited and far away lands.

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