SOLAR POWERED LAKE AND POND AERATION SYSTEM

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Introduction:
1. In this project, we introduce Solar systems which are great for both remote installations and environmentally conscience applications.
2. They are for aquatic environments ranging in size from small ornamental ponds to lakes up to 3-5 acres.
3. These fully automatic systems are designed to run up to hours together per day under standard operating conditions.
4. The battery backup system allows them to run like normal under less than optimal conditions.
5. Built for both hot and cold climates, no climate is too harsh for solar aeration systems.
6. As air travels up the water column the pressure surrounding the bubbles slowly decreases causing the bubbles to increase in size; a slight current begins to develop.
7. The current draws oxygen-depleted water from the bottom, oxygenates it and transports it to the surface.
8. This action protects fish, aquatic organisms and beneficial bacteria from suffocation by breaking down stratified waters while increasing dissolved oxygen levels.
9. Low levels of dissolved oxygen and highly stratified waters can characterize degraded or where warm, oxygen-rich water is suspended above cool, oxygen-depleted bottom waters.
10. As anaerobic conditions begin to develop in deeper water, naturally occurring aerobic bacteria can no longer perform beneficial tasks such as waste digestion and water purification.
11. With time, water quality greatly decreases leading to unsightly blooms of algae, the accumulation of aquatic sludge and the build-up of gases such as methane and hydrogen sulphide (which are well known for their offensive odours).
12. Low oxygen levels can also lead to fish death and water kill, luckily, degraded ponds and lakes can easily be enhanced with the addition of a Lake Bed Aeration System.
13. Lake Bed Aeration acts to increase dissolved oxygen levels while eliminating stratified waters.
14. Aerobic bacteria begin to recolonize in deeper water, where they rapidly begin to digest accumulated sludge and improve water quality.

Objectives:
Solar aeration is the best alternative to get steady and reliable aeration, where electricity is just not an option.

1. The battery backup system continues operations under less-than-optimal conditions
2. Built for both temperate or colder climates
3. Economical, no additional costs to run
4. The Solar systems pay for themselves with time, resulting in an unbelievable cost savings over electric-powered aeration systems.

**Methodology:**
1. Solar Aeration is the introduction of compressed air and automatic filtration of water body.
2. When released at the bottom of a pond or lake, compressed air naturally begins to migrate towards the surface of the water.
3. Main concern of lakes and ponds are that they remain stagnant.
4. Due to no movement in lakes and ponds we come across bad odours, development of acidic nature in water, harming the aquatic life.
5. So a filtration process as well as flow of water within the surrounding is also necessary.
6. A sliding filtration process helps to clear out excess waste underwater.
7. So during oxygenation water flows and the filter catches the excess waste and once the filter is full the sensors get activated and with help of sliding process filters get changed.
8. Solar tracker tracks the solar power required for efficient run of the system.
9. This system does the process in a slow process as area covered is large.
10. Installing 2-3 systems may help recover the process fast.

**Hardware requirements:**
   - Microcontroller and circuit, solar panels, fish tank.

**Block diagram:**

![Block diagram of solar powered lake and pond aeration system](image)

**Conclusion:**
We are proud that we have completed the work within the limited time successfully. At the end of this project you will have more inside knowledge about SOLAR POWERED LAKE AND POND AERATION SYSTEM. Our project is interesting as well has a detailed evaluation of prevailiry chemical and biological limnology and anticipated effects and engineering evaluation of most appropriate technology was utilized.

We have developed a project “SOLAR POWERED LAKE AND POND AERATION SYSTEM” which helped in increasing dissolved oxygen by eliminating stratified water and more information regarding aeration and filtration of lakes and reservoirs is known.

Scope for Future work:
1. This project helps to remove slag from pond and lake without harming the aquatic life.
2. It is environmental friendly using solar panels.
3. It can be used in large scale and helps to keep the pond and lake clean and clear.
4. There is nothing more beautiful than a peaceful pond and a crystal clear lake with a fountain adorning its water.
5. Finally it helps to provide bright future of lakes and ponds in INDIA.