

HACKATHON
MSME IDEA HACKATHON 4.0

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HI/BI Name	Haldia Institute of Technology
Problem Statements	Frontier Technology in MSME
Idea Sector	Agriculture, Rivers & Ocean Produce based industries, fertilizers, Agricultural Implements & Agro processing and any related sub-sector
Title of proposed idea/innovation	IOT enable smart soilless stevia farming chamber
Briefly explain newness/uniqueness of the innovation	A readymade farming chamber for high value stevia plants is a demand of time due to its use as an alternative of sugar as well as sweetener. The proposed stevia farming chamber is loaded with all smart features including recycling of water, moisture detector, temperature controller, NPK sensor, Illumination and pH sensor etc. powered by solar photovoltaic. As stevia farming is sensitive to water logging, so proposed system avoid soil media and precise control of moisture in the root support medium. Temperature control system is designed to monitor remotely and operate through circulation of air using solar power. pH monitoring is important for stevia farming, thus it was designed to give alert message for the deviation set values and take corrective measures through dosing buffer solution to the circulating water with precision, newness of the system is to control everything without human interfere. All parameters could monitor and control anywhere if farming chamber is integrated with internet/cloud. Soilless farming maintains precise composition of nutrient and fungal resistant solution to grow healthy leaves, considered as uniqueness of the proposal. Smart farming chamber will not discharge any water, thus the zero discharge farming house is able recycle entire amount of nutrient solution. Fungal infection or any other disease will be captured by an in-house camera to analysis exact defects and helps to decide corrective measures even remotely with IOT enable control unit

Concept & Objective	Stevia is a well known plant for its natural sweet leaves. It contains the compound called steviol glycosides which are sweeter than sugar and calorie-free. Warm climates with temperatures between 20-30°C (68-86°F) are ideal for Stevia cultivation. Besides, stevia cultivation needs well-drained, loamy soil with a slightly acidic to neutral pH (varies from 6.5 to 7). On the other hand, stevia requires consistent moisture, so irrigation is essential, especially during dry periods. However, its crucial not to overwater, as stevia does not tolerate waterlogged conditions. The use of Internet of Things (IoT) technology is useful to cultivate these types of sensitive crops in Indian climate. Therefore, this proposal aims to develop IoT enabled smart farming chamber for optimal growth of healthy stevia plants. The smart farming chamber will not discharge any water, thus this zero discharge farming house is able recycle entire amount of nutrient solution. The circulation will be driven by solar photovoltaic system.
Specify the potential use of application in industry/market in brief	Smart stevia farming can be practiced in roof top in domestic purpose. Apart from this such kind of innovative technology can be scaled up in different industries. The size of the stevia market is projected to be USD 0.84 billion in 2024 and USD 1.36 billion by 2029, with a compound annual growth rate (CAGR) of 10.12 from 2024 to 2029. The food and beverage sector has made extensive use of stevia as a vital component of numerous goods, such as dairy products, snacks, and beverages. The desire from consumers for healthier options as well as legislative actions supporting lower sugar content are the driving forces behind this trend. In the beverage business, stevia has become increasingly popular, especially in the creation of flavored water, soft drinks, and low-calorie beverages. Because of its natural origin and low calorie content, it appeals to consumers who are health-conscious. Because of its adaptability to a wide range of meals, such as dairy products, baked goods, and sweets, it is a necessary component in the food and beverage sector. Its broad use can be attributed to its ability to maintain sweetness at various pH levels and temperatures.
Briefly provide the market potential of idea/innovation	In true sense every household require a stevia plant, thus every household need at least one smart stevia farming chamber. The growing needs of stevia as an alternative sweetener due to continuous increase in diabetic patient around the world make our proposal very important. Approximately 537 million persons between the ages of 20 and 79 had diabetes, according to the International Diabetes Federations (IDF) Diabetes Atlas 10th edition 2021. By 2030, there will be 643 million diabetics worldwide, and by 2045, there will be 783 million. Thus, worries about the harmful effects of consuming too much sugar have led to an increase in interest in sugar substitutes. Recently, stevia has become more well-liked as a healthy substitute for artificial sweeteners, particularly among people trying to control their blood sugar levels or cut back on calories. Compared to sugar, stevia is a considerably sweeter plant-based sweetener with no calories. Apart from its application as a sweetener in food and beverage items, stevia is also utilized in certain personal hygiene products as a low-calorie, natural substitute for sugar-based components. Numerous scientific investigations have demonstrated the possible health advantages of stevia, including lowered blood pressure and enhanced insulin sensitivity. The size of the stevia market is projected to be USD 0.84 billion in 2024 and USD 1.36 billion by 2029, with a compound annual growth rate (CAGR) of 10.12 from 2024 to 2029.
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