**Utilization of Banana Stem for Sustainable Production of Banana Stem Water; A Solution to Reduce Pollution, Toxin Production, and Climate Change**

**Introduction**

Banana is a major fruit crop within Pakistan’s agricultural landscape, and the widespread popularity of banana has led to significant agricultural waste, particularly in the form of discarded banana stems. This wastage of banana stems has emerged as a critical environmental concern, directly contributing to toxin production, environmental pollution, and further intensifying the challenges of climate change. The objective of this research proposal is to offer an environmentally sustainable solution by proposing/advocating the production of banana stem water. By utilizing banana stems effectively, we aim to minimize environmental impact, optimize resource utilization, and generate value-added products.

**Problem Statement**

The wastage of banana stems results in several adverse outcomes. Firstly, the decomposition of these discarded stems causes the generation of greenhouse gases, including methane, thereby exacerbating the issue of climate change.

Methane, a strong greenhouse gas that contributes to global warming, is released during the anaerobic degradation process. Furthermore, as the stems decompose, organic contaminants are released into the soil and water, endangering both human health and the ecosystem.

The buildup of discarded banana stems is a problem for waste management systems as it increases the need for landfill space and raises related environmental issues.

If the issue of banana stem waste is not addressed, pollution levels will increase, pollutants will contaminate the land and water supplies, and greenhouse gas emissions will keep rising, further accelerating climate change. Additionally, the monetary losses brought on by ineffective waste management and the unrealized value of the banana stem as a resource will continue.

**Proposed Solution**

The proposed solution is the production of banana stem water, a sustainable substitute that not only reduces the environmental impact but also utilizes the nutritional advantages of banana stems. Banana stem water can be obtained by crushing and filtering the stems through a simple and cost-effective process, to produce a nutrient-rich beverage.

Numerous health advantages of banana stem water include support for cardiovascular health, bodily detoxification, and gastrointestinal wellness. As a natural plant growth booster and organic insecticide, it has the potential to be used in agriculture and is a useful food supplement due to its high fiber content.

Banana stem water can also be used in a variety of culinary preparations to boost nutrition and enhance flavors.

**Cost and Schedule**

**Cost Analysis**

The cost estimation will take into account a number of factors, such as equipment procurement, raw materials, and marketing and packaging.

**Equipment Procurement**

Essential equipment for banana stem water production includes crushers, filters, storage containers, and processing tools. An estimated 100,000 PKR will be spent on the purchase of the equipment.

**Raw Material (Banana Stems) Acquisition**

Sourcing banana stems directly from local farmers or markets is feasible. Although the price of buying banana stems would depend on the current market rates, an estimated monthly cost of 100,000 PKR, but an estimated monthly expenditure of 50,000 PKR can be allocated for raw material acquisition.

**Marketing and Packaging**

Budgeting for marketing and packaging is crucial in order to promote the product and attract potential buyers. This could involve creating marketing campaigns, packaging materials, and labelling. The expected budget for marketing and packaging costs is 50,000 Pakistani rupees.

**Total Estimated Budget**

Equipment Procurement: 100,000 PKR

Raw Material Acquisition: 50,000 PKR (monthly)

Marketing and Packaging: 50,000 PKR

**NOTE:** These cost estimates are approximate and subject to change depending on the area, the state of the market, and the size of the project. It will be essential to regularly monitor costs and optimize them in order to keep costs as low as feasible while preserving quality and sustainability.

**Schedule for Banana Stem Water**

**Feasibility Studies**

Duration: 1 month

Conduct thorough feasibility studies to evaluate the production of banana stem water during this phase. This involves looking into consumer demand, analyzing costs, and assessing risks and challenges.

**Equipment Procurement**

Duration: 2 weeks

Choose reliable vendors and acquire the machinery, such as crushers, filters, storage containers, and processing instruments, required to produce banana stem water.

**Raw Material Acquisition**

Duration: Ongoing (Monthly)

Form alliances with nearby farmers or market vendors to obtain banana stems for manufacture. Set aside a budget of 50,000 PKR per month to buy banana stems, assuring a consistent supply.

**Production and Processing**

Duration: Ongoing

Start the production procedure by processing and crushing the banana stems to release the water. Implement quality control procedures to guarantee the reliability and safety of your products. Maintain product integrity while increasing production efficiency.

**NOTE:** The timeline offered is only meant to serve as a broad reference, and it may need to be modified in response to unique conditions, resource availability, and market dynamics. Regular monitoring and flexibility will be essential for successful implementation.

**Conclusion**

Banana stem water, which is created from discarded banana stems, provides a potential substitute for reducing pollution, the production of toxins, and the effects of climate change. This project seeks to advance environmental preservation, lessen waste, and create economic value by implementing sustainable practices and utilizing the latent potential of banana stems. The planned study will examine the viability, advantages, and effects of producing banana stem water, laying the groundwork for a more environmentally friendly and sustainable future. By properly utilizing banana stems, we may reduce environmental pollution, the creation of toxins, and climate change, resulting in a safer and more sustainable world for future generations.

**References:**

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