**✅ Slide 1: Introduction to Design Idea (System Overview)**

**Script:**

I will present our design idea: an **Automated Pest Detection**

This system is designed to target common rice pests, especially the **rice earhead bug** and **brown planthopper**.

It combines detection, deterrence, and removal using **low-cost components** and runs completely off-grid using a **solar panel and a 12V battery**.  
  
We use **Light Dependent Resistors (LDRs)** to detect shadows or movement caused by pests. Once detected, the Arduino microcontroller activates **UV LEDs, a red laser diode**, and a **vacuum pump** to repel or capture the pests.

This fully automated process allows real-time pest response **without the need for farmers to monitor manually.**

**✅ Slide 2: Approaches and Technologies Used**

**Script:**

Our approach combines sustainability, automation, and simplicity.

First, the system **detects, repels, and removes pests—all in one loop**, streamlining pest control.

It is solar-powered with battery backup, making it eco-friendly and reliable even in low-sunlight conditions.

We also reduce human workload through **Arduino-controlled automation**, which triggers actions based on sensor input.

On the right, you can see the core components: Arduino UNO, relay module, LDR, UV LED, laser diode, and a 12V vacuum pump—all connected to a solar charging setup.

**✅ Slide 3: Benefits, Impacts, and Constraints**

**Script:**

This system offers several key benefits:  
① It's **off-grid**, powered by solar energy.  
② It uses **affordable components** like UV LEDs and LDRs.  
③ It enhances safety by **reducing pesticide use**.

In terms of **impact**, it protects farmers’ health, **preserves biodiversity** in rice fields, and improves **economic livelihoods** by increasing yield.

However, there are **two main constraints**:

* The **initial cost** of components like the solar panel and the vacuum pump.
* And **weather dependency**, since the system relies on sunlight for energy.

Despite this, the long-term benefits of **sustainable, low-maintenance pest control** make this solution highly valuable for rural communities.