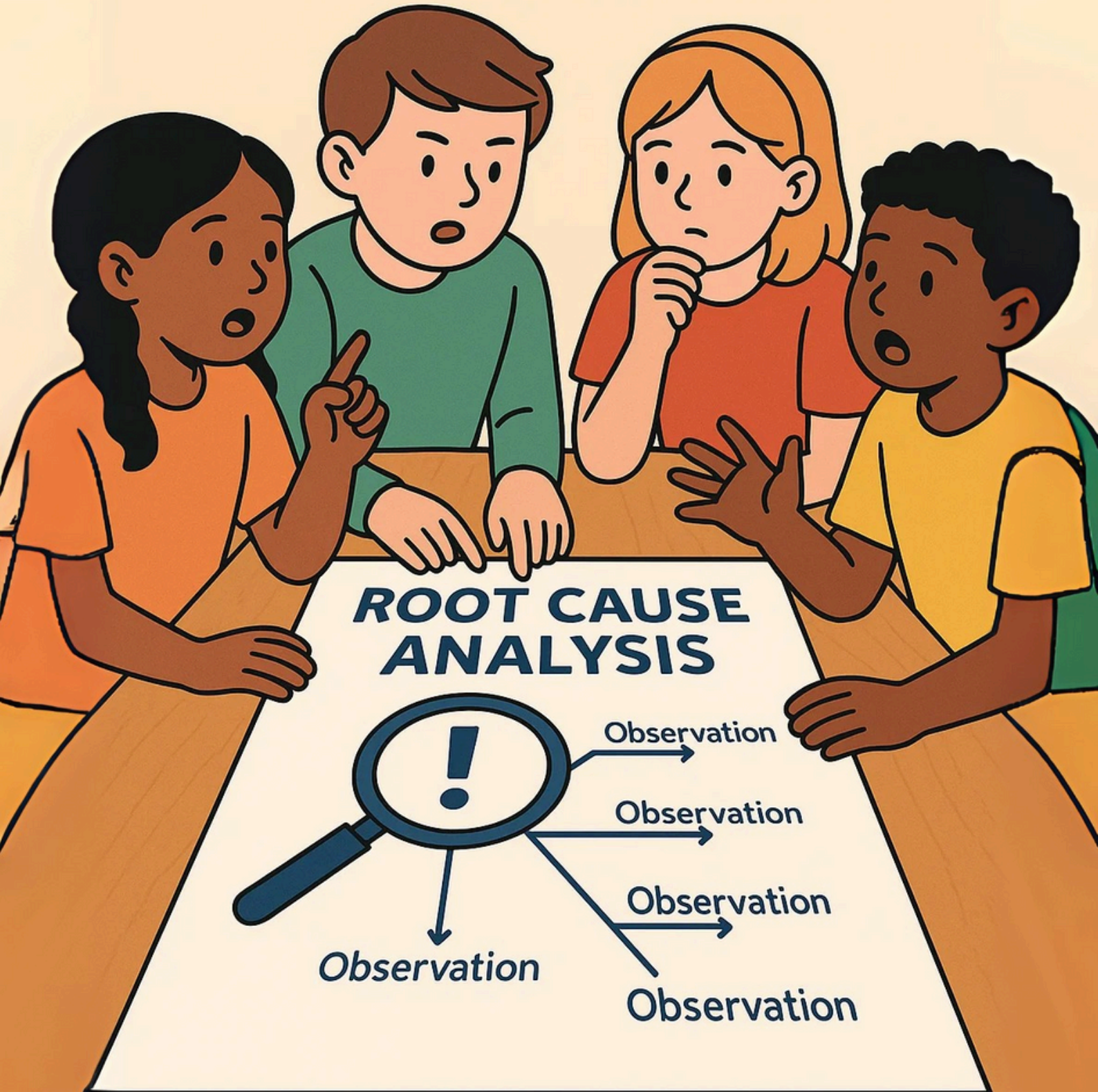


Root Cause Analysis

Digging Deeper to Solve Problems



Introduction

National innovation programs like INSPIRE MANAK and GYS Avishkar Awards are not just looking for cool gadgets or clever models. They're searching for ideas that solve real-world problems, are socially relevant and can be scaled across the country.

But before we jump into making things, it's important to ask: Are we solving the right problem?

One powerful tool to do this is **Root Cause Analysis**, a simple step-by-step method that helps you find the actual reason behind a problem.

What Is Root Cause Analysis?

Root Cause Analysis (RCA) is a technique to identify the true cause of a problem, like a detective finding the real culprit.

This method helps you ask smart questions to reach the bottom of the issue, so your solution is not temporary but lasting and effective.

Why Use Root Cause Analysis?

- **Understand the Real Problem:** Avoid fixing symptoms and get to what's really wrong
- **Build Better Solutions:** Once you find the root, your idea becomes more effective
- **Think Scientifically:** Ask questions, analyse data and form strong conclusions
- **Innovate with Purpose:** Create ideas that matter to people
- **Solve Indian Challenges:** Use local thinking to solve local problems

When and Where Can You Use Root Cause Analysis?

You can use RCA in many real-life situations

- In Schools: Why is student attendance low in government schools?
- In Villages: Why does the hand pump in a drought-prone area stop working?
- In Cities: Why are garbage bins always overflowing in a colony?
- In Environment Projects: Why are plantation drives failing despite planting thousands of trees?
- In Road Safety Projects: Why do children in your area avoid using the zebra crossing?

Wherever something is going wrong, RCA can help make it right.



How to Use Root Cause Analysis?

Let's break it down into steps you can use in your projects.

Step 1: Identify the Problem. Describe it clearly.

Example: "Our model to collect rainwater is not working."

Step 2: Ask "Why" Five Times

Use the 5 Whys method to dig deep.

Why is it not working? The water overflows quickly.

Why? The tank fills too fast.

Why? The pipe diameter is too wide.

Why? We didn't measure rainfall intensity.

Why? We copied the design from a different region.

Root Cause: The model wasn't suited for local rainfall conditions.

Step 3: Observe and Record

Check your model. Talk to users. Collect data.

Step 4: Fix the Root Cause

Redesign your solution based on what you found.

Let's Explore Through Indian Case Studies

Case Study 1

Solar Lamps in Rural Maharashtra

Problem: Students in Palghar district were given solar lamps for night study. But many stopped using them within a month.

A student team investigated using RCA

Why did students stop using the lamps? – They stopped working.

Why? The battery died.

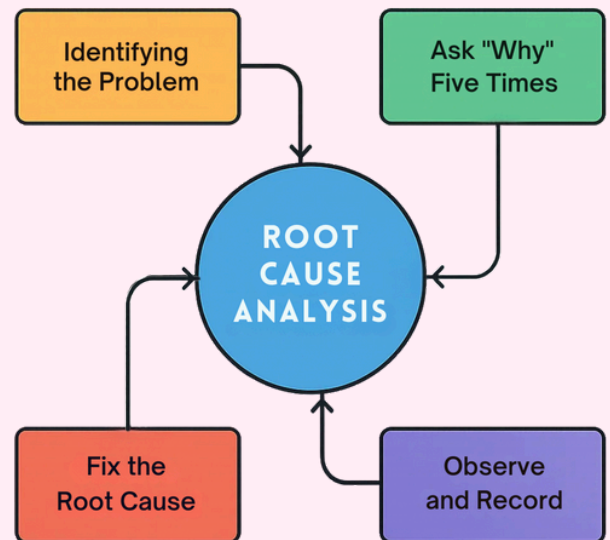
Why? It wasn't charged.

Why? The solar panel didn't face the sun.

Why? The design didn't allow rotation.

Root Cause: Fixed panel position made charging ineffective.

Innovation Outcome: Students added a 360-degree rotatable base for better sun exposure. The improved design won them a state-level award.



Case Study 2

Dirty Water in a Pond (Tamil Nadu)

Problem: A pond near Madurai turned green and smelly even though it was cleaned last year.

Local students used RCA to explore:

Why is the pond dirty again? – Algae is growing rapidly.

Why? There's too much sewage in it.

Why? Drains from nearby homes connect to it.

Why? There's no sewage treatment system.

Why? Families aren't aware of the danger.

Root Cause: Lack of awareness and absence of treatment systems.

Innovation Outcome: Students designed a basic floating wetland using old bottles and native plants to clean the water naturally. It was implemented with the Panchayat's help.

Case Study 3

The School Attendance Drop in Bihar

Problem: A school in Araria saw a major drop in Class 6–8 attendance during the winter months.

Students used RCA to investigate

Why do students skip school? – It's too cold.

Why don't they wear warm clothes? – They don't have them.

Why? Families can't afford them.

Why not? Seasonal jobs reduce income in the winter.

Root Cause: Economic hardship during winter months.

Innovation Outcome: Students proposed a community sweater bank using donated woollens and initiated awareness through wall posters and skits. Attendance improved significantly.

Try the 5 Whys Challenge!

Choose a real problem you've noticed—maybe your school's water cooler is always leaking or your village bus stop is always dirty.

Ask "why" five times and go as deep as you can. Then brainstorm a solution.

Tips to Use Root Cause Analysis

- Draw it out – Use flowcharts or a "cause and effect" fishbone diagram
- Look carefully – Observe before jumping to conclusions
- Work with your community – They may have insights you don't
- Don't stop at one answer – Go deeper than the obvious
- Use your phone – Record changes, patterns or interviews as part of your RCA process



Conclusion

Real Problems Need Real Thinking

Great innovations aren't just shiny or smart, they're rooted in real problems. Root Cause Analysis helps you think like a scientist, act like an engineer and innovate like a changemaker. So next time you see a broken swing, a water shortage or an idea that just won't work, don't just patch it up.

Ask WHY! Then solve it.

That's how innovators are born.

Sudoku Challenge 2504

3	8		9			2		5
					8	7	3	
	6		3			9	8	
					3	5		1
9	1		5		7		2	3
7		3	1					
	3	5			1		9	
	7	4	6					
8		1			2		6	7

Solutions are on Inside Back Cover.