

# AI-03968 Poverty Fault Tree Analysis

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Tags	Problem
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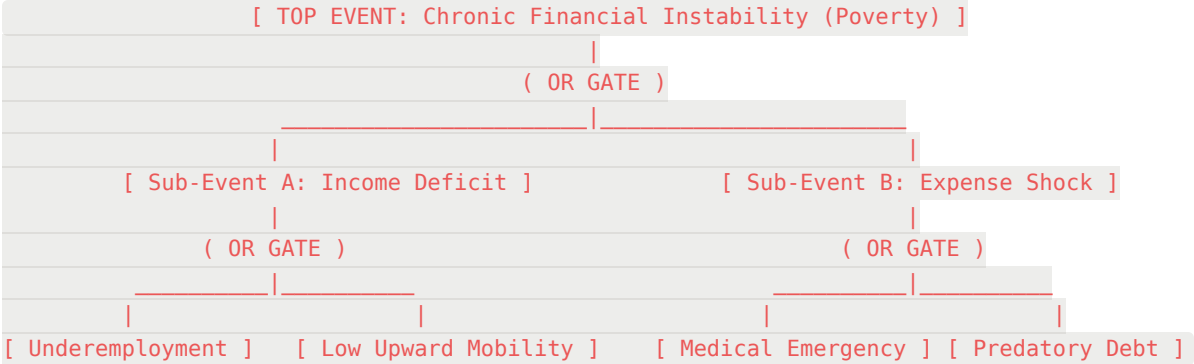
Create a hypothetical fault tree analysis of a person in poverty. Also include the countermeasure on how to get out of the danger loop. Use the n8n workflow framework.

A **Fault Tree Analysis (FTA)** is typically an engineering tool used to find the root causes of a system failure. When applied to the systemic condition of poverty, it maps how multiple vulnerabilities feed into one another to sustain a "danger loop" or a poverty trap.

To translate this framework into **n8n**, we can model the components of the fault tree as conditions, routing logic (AND/OR gates), and data states, while implementing specific workflow triggers to act as automated **countermeasures**.

## 1. The Hypothetical Fault Tree Map

An FTA branches downward from a single **Top Event** (System Failure) into contributing events using logical gates.



## The Logic Breakdown

- **OR Gates:** Poverty rarely requires *every* bad variable to happen simultaneously; it persists if **either** your income fails to meet baseline needs **OR** an unexpected expense shock wipes out your safety net.
- **The Danger Loop:** Low mobility feeds back into underemployment, while predatory debt rapidly creates new expense shocks, causing a self-sustaining cycle.

## 2. n8n Workflow Architecture

In n8n, this system is modeled as a data pipeline. Instead of just mapping the failure, the workflow actively tracks the user's financial inputs, flags when thresholds breach a danger zone, and routes them directly to automation blocks designed as countermeasures.

Here is the structured JSON configuration for an n8n workflow that monitors these states, executes logical checks (the FTA gates), and runs countermeasures.

You can copy this JSON block and paste it directly into your n8n canvas:

JSON

```
{
  "name": "Poverty FTA Tracking & Countermeasure System",
  "nodes": [
    {
      "parameters": {},
      "id": "1d8b9e6f-472a-43cf-8c6f-a89e93bf01ad",
      "name": "Schedule Trigger (Monthly Check)",
      "type": "n8n-nodes-base.scheduleTrigger",
      "typeVersion": 1.1,
      "position": [100, 300]
    },
    {
      "parameters": {
        "values": {
          "number": [
            {
              "name": "monthly_income",
              "value": 1800
            },
            {
              "name": "essential_expenses",
```

```

        "value": 1950
      },
      {
        "name": "emergency_savings",
        "value": 150
      },
      {
        "name": "high_interest_debt",
        "value": 1200
      }
    ]
  }
},
{
  "id": "2c9b8d7e-583b-44df-9d7f-b98f94cf02be",
  "name": "Mock Financial State Data",
  "type": "n8n-nodes-base.set",
  "typeVersion": 3.2,
  "position": [320, 300]
},
{
  "parameters": {
    "conditions": {
      "options": {
        "caseSensitive": true,
        "leftValue": "",
        "type": "mix"
      },
      "conditions": [
        {
          "id": "income_deficit_check",
          "leftValue": "={{ $json.monthly_income }}",
          "rightValue": "={{ $json.essential_expenses }}",
          "operator": "lt"
        }
      ]
    },
    "combinator": "and"
  }
},
{
  "id": "3a8c7b6d-694c-45ef-ae8f-c09f05df03cf",
  "name": "Gate: Income Deficit? (OR)",
  "type": "n8n-nodes-base.if",
  "typeVersion": 2.2,
  "position": [560, 200]
},
{
  "parameters": {
    "conditions": {
      "options": {
        "caseSensitive": true,
        "leftValue": "",
        "type": "mix"
      }
    }
  },

```

```

"conditions": [
  {
    "id": "savings_buffer_check",
    "leftValue": "={{ $json.emergency_savings }}",
    "rightValue": 500,
    "operator": "lt"
  },
  {
    "id": "debt_trap_check",
    "leftValue": "={{ $json.high_interest_debt }}",
    "rightValue": 1000,
    "operator": "gt"
  }
],
"combinator": "or"
}
},
{id": "4b9d8c7e-705d-46fa-bf9f-d10f06df04df",
"name": "Gate: Expense Shock Vulnerability? (OR)",
"type": "n8n-nodes-base.if",
"typeVersion": 2.2,
"position": [560, 420]
},
{
  "parameters": {
    "assignments": {
      "assignments": [
        {
          "id": "assign_upskill_action",
          "name": "action_required",
          "value": "Trigger income intervention: Fetch free regional upskilling certifications, open-source tech bootcamps, and food bank safety nets to offset baseline costs.",
          "type": "string"
        }
      ]
    }
  }
},
{id": "5c0e9d8f-816e-47fa-cf0f-e21f07df05ef",
"name": "Countermeasure: Upskill & Cost Offset",
"type": "n8n-nodes-base.set",
"typeVersion": 3.2,
"position": [820, 160]
},
{
  "parameters": {
    "assignments": {
      "assignments": [
        {
          "id": "assign_debt_action",
          "name": "action_required",
          "value": "Trigger debt consolidation buffer: Auto-draft strict low-income g

```

```

rant applications and execute a localized debt avalanche sequence.",
    "type": "string"
  }
]
},
{id": "6d1f0e9a-927f-48fb-df1f-f32f08df06fd",
"name": "Countermeasure: Debt Snowball / Grant Matching",
"type": "n8n-nodes-base.set",
"typeVersion": 3.2,
"position": [820, 380]
},
{
  "parameters": {
    "notice": "System is stable. Financial buffer meets safety thresholds."
  },
  "id": "7e2a1f0b-038a-49fc-ef2f-g43f09df07fe",
  "name": "System Status: Stable",
  "type": "n8n-nodes-base.noOp",
  "typeVersion": 1,
  "position": [820, 580]
}
],
"connections": {
  "Schedule Trigger (Monthly Check)": {
    "main": [
      [
        {
          "node": "Mock Financial State Data",
          "type": "main",
          "index": 0
        }
      ]
    ]
  },
  "Mock Financial State Data": {
    "main": [
      [
        {
          "node": "Gate: Income Deficit? (OR)",
          "type": "main",
          "index": 0
        },
        {
          "node": "Gate: Expense Shock Vulnerability? (OR)",
          "type": "main",
          "index": 0
        }
      ]
    ]
  },
  "Gate: Income Deficit? (OR)": {

```

```

    "main": [
      [
        {
          "node": "Countermeasure: Upskill & Cost Offset",
          "type": "main",
          "index": 0
        }
      ],
      []
    ]
  },
  "Gate: Expense Shock Vulnerability? (OR)": {
    "main": [
      [
        {
          "node": "Countermeasure: Debt Snowball / Grant Matching",
          "type": "main",
          "index": 0
        }
      ],
      [
        {
          "node": "System Status: Stable",
          "type": "main",
          "index": 0
        }
      ]
    ]
  }
},
"settings": {
  "executionOrder": "v1"
}
}

```

### 3. Breaking out of the Danger Loop

The automated countermeasures in the n8n model target specific leverage points to disrupt the reinforcing feedback loop of poverty:

#### Countermeasure A: Income Upward Mobility

- **The Problem:** Underemployment or low-wage work creates a static deficit where income is strictly less than living costs ( $\$Income < Expenses\$$ ).
- **The Logic Intervention:** Rather than just cutting costs (which hits a floor of minimum survival requirements), the workflow intercepts this path to flag

high-yield upskilling opportunities (such as specialized certifications or open-source pathways) and local nutritional safety nets to temporarily depress fixed expenses.

## **Countermeasure B: De-risking Shocks**

- **The Problem:** Low or flat savings ( $\$ < \$500$ ) means minor physical or mechanical issues turn into catastrophic high-interest debt cycles.
- **The Logic Intervention:** The workflow monitors debt thresholds and liquid emergency reserves. When cash balances drop below safety limits, the node is programmed to auto-filter and surface localized assistance grants and optimize debt pay-down order, protecting thin margins from compounding interest charges.