



The Skipping Stone Effect & Jevin's Paradox

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Imagine skipping a flat stone across a pond, it glides skillfully across the pond, at the end reaching its final resting point and sinking. However, at the same time, each time it jumped across the water new ripples began to form disturbing the peace, at the end, out of sight, the stone crashing into the water violently and sinking to the bottom never to be seen again.

These are the effects that can be felt by each decision society takes at each step.

An idea taken at each step deliberately to solve a problem will often create other problems in its wake, minute problems that can be spread far and wide, but nonetheless felt even if it's slight.

But the impact? Depending on the cause, it can either be big or not hit at all. Like skipping a stone across a pond, skipping it successfully across the pond with a gentle sink towards the bottom at the end, or trying but then failing at the initial toss respectively

Imagine skipping a flat stone across a calm pond. With the right technique, it glides gracefully across the surface, touching down multiple times before finally sinking to the bottom. But notice what happens with each skip: new

ripples spread outward in concentric circles, disturbing the previously still water. These ripples travel far beyond where the stone itself will ever reach, affecting the entire pond's ecosystem in ways both subtle and profound.

This is the Skipping Stone Effect - the phenomenon where every deliberate action taken to solve one problem inevitably creates a cascade of unintended consequences that spread far beyond the original point of impact.

Understanding the Ripple Pattern

Just as a stone's success depends on angle, force, and surface conditions, societal decisions create different patterns of consequences:

The Successful Skip: A well-planned policy that achieves its primary goal while generating manageable secondary effects. The ripples are predictable and contained.

The Failed Launch: A poorly conceived decision that creates immediate chaos - like a stone that hits the water with a violent splash, sending chaotic waves in all directions.

The Deceptive Glide: Perhaps most dangerous - a decision that appears successful initially but creates subtle, far-reaching problems that compound over time.

Examples of the Effect in Action

The Highway Expansion Trap - Jevin's Paradox: A city faces traffic congestion, so leaders decide to renovate and expand highways - the stone skips smoothly at first. Traffic flows better initially, validating the decision. But the ripples spread: improved highways attract more drivers, encouraging suburban sprawl and car dependency. Air pollution increases, public transit ridership drops as buses compete with faster highways, and communities become more fragmented. Meanwhile, the opportunity cost looms large - those same resources could have built comprehensive public transit and converted highway materials into sustainable infrastructure, fundamentally reducing car dependency rather than enabling it.

The stone appeared to skip successfully, but the expanding ripples created exactly the problems the original decision was meant to solve, only magnified.

The Beirut Airport Bottleneck: Lebanon expands Rafic Hariri International Airport to handle 50,000 additional passengers - a clear economic win. The

airport renovation succeeds brilliantly, attracting more flights and boosting tourism revenue. But the ripples reveal the flaw: the airport relies on the same highway infrastructure that connects Tripoli to Tyre - essentially one major interstate corridor.

As passenger volume surges, the highway becomes severely congested. What was meant to be a 30-minute airport journey becomes a 2-hour ordeal during peak times. Hotels near the airport raise prices due to artificial scarcity from access difficulties. Businesses relocate away from the corridor to avoid traffic. International visitors experience Lebanon's infrastructure strain firsthand, potentially damaging the country's tourism reputation. The economic gains from increased airport capacity get partially offset by productivity losses from regional gridlock.

The airport expansion stone skipped beautifully, but its ripples choked the very arteries meant to carry its benefits to the broader economy.

The Privatization Complication: The situation becomes more complex because Beirut's airport is privatized. The private operator naturally focuses on maximizing airport capacity and revenue - that's their mandate. But they have no responsibility for highway congestion, public transit, or regional economic impacts. Meanwhile, politicians can deflect criticism about traffic problems by saying "that's the private airport's responsibility" while simultaneously avoiding investment in public infrastructure that might compete with private taxi and parking interests.

This creates a perfect storm where systemic solutions require public-private collaboration, but the incentive structures actively discourage it. The private airport profits from expansion regardless of external congestion costs, while politicians avoid accountability for addressing those costs.

Breaking the Pattern: The Distributed Stone Approach

What if instead of throwing one heavy stone, we scattered multiple smaller ones across the pond? Consider an alternative approach to the Beirut airport expansion:

Original Plan: \$10 million for 50,000 additional passenger capacity

Systems-Thinking Alternative: Same \$10 million budget, distributed strategically:

- **\$2 million:** Modest airport expansion (+10,000 passengers)
- **\$6 million:** Subway line connecting airport to city center + stops along-way
- **\$0.5 million:** Neighborhood sidewalk expansion for last-mile connectivity
- **\$1 million:** Bus shuttle system with dedicated airport station
- **\$0.5 million:** Annual salaries for bus drivers to get people invested into the service (takes a time to break even)

The Ripple Effects: This distributed approach creates positive cascading consequences. The subway reduces highway pressure while serving daily commuters, not just airport traffic. Improved sidewalks encourage local foot traffic, benefiting neighborhood businesses. The bus system offers affordable airport access, democratizing travel.

The Trade-offs: Airport parking revenue decreases, taxi services face competition, and the total passenger increase is smaller initially. But the infrastructure investments compound - the subway serves the city for decades, sidewalks boost property values, and reduced car dependency improves air quality.

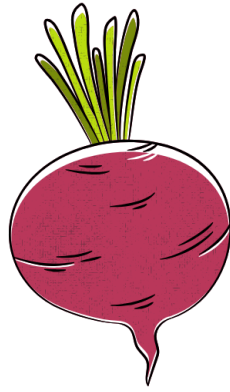
Instead of one stone creating expanding problems, multiple smaller interventions create overlapping solutions.

The Paradox of Disruption

Here lies a crucial insight: **short-term disruptions are preferable to long-term ones.** A failed skipping stone creates an immediate, violent splash that everyone notices and addresses quickly. But a graceful stone that skips successfully? Its problems ripple outward quietly, often unnoticed until they've spread throughout the entire system.

Building a subway causes obvious, immediate disruption - construction noise, traffic diversions, local business interruptions. These short-term costs are visible and temporary. But the alternative - letting the highway choke the city for decades - creates far greater cumulative disruption that's harder to measure and politically easier to ignore.

The graceful stone deceives us into thinking we've succeeded, while the failed stone forces us to confront reality immediately. Sometimes the splash is exactly what we need.



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