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Socio-Cognitive Dynamics in Sustainable Water Product Markets: A Constructivist Grounded Theory Study of Korea's Bottled and Purified Water Industries

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Abstract

This study employs a constructivist grounded theory approach based on 69 in-depth interviews conducted between March 2022 and December 2023 to examine socio-cognitive dynamics in Korea's bottled water and household water purifier markets. The study addresses a gap in prior research by explaining how product meanings and stakeholder strategies co-evolve across adjacent "safe-water" markets under regulatory and sustainability pressures. Drawing on qualitative data from 69 stakeholders, including producers (n = 30), consumers (n = 19), and institutional experts (n = 20), we analyze how distrust, risk perception, and health consciousness reshape conceptual systems and market strategies. These shifts drive innovation across markets, including new technologies, service models, and branding strategies. The findings show that socio-cognitive stabilization arises through iterative interactions among institutional shocks, producer reinterpretation, and consumer adaptation. In the bottled water market, the meanings of "natural purity" became materially embedded in packaging, mineral labeling, and brand narratives. In the purifier sector, "technological reliability" was institutionalized through service-based maintenance systems and visible quality control technologies. These processes developed within asymmetric communicative environments shaped by corporate branding capacity and media amplification. This study refines socio-cognitive market theory by specifying boundary conditions under institutional distrust in developed economies. Although Republic of Korea possesses advanced drinking water infrastructure comparable to that of other developed economies, public confidence in tap water has periodically weakened following highly salient contamination incidents and regulatory transitions. This paradox provides a theoretically informative context for examining how product meanings and stakeholder behaviors mutually adapt over time. Although environmental impact metrics were not directly measured, the findings suggest that sustainability policies must address socio-cognitive trust dynamics alongside regulatory instruments such as plastic levies, certification schemes, and transparent risk communication.

Keywords: socio-cognitive dynamics; product meaning; grounded theory; institutional distrust; sustainability transitions; bottled water; water purifiers; Republic of Korea

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Academic Editors: Asad Sarwar Qureshi and Redouane Choukr-Allah

Received: 8 January 2026
Revised: 11 March 2026
Accepted: 13 March 2026
Published: 19 March 2026

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1. Introduction

Water is a critical natural resource that is fundamental to both human health and environmental sustainability. In recent decades, global concerns over water pollution and

supply risks have elevated water management from a matter of consumer preference to a public policy imperative. Korea's experience with drinking water offers a compelling case: despite modern infrastructure, public trust in tap water has been periodically undermined by highly publicized contamination incidents and persistent perceptions of risk [1–4]. As a result, many Korean consumers have turned to bottled water and household water purifiers as perceived safer alternatives. The growth of these markets raises important sustainability concerns ranging from plastic waste to energy use, making it essential to understand how consumer perceptions and industry practices surrounding "safe water" evolve.

This study addresses a theoretical puzzle: why distrust in technologically advanced public water infrastructure continues to persist notwithstanding the simultaneous emergence of two adjacent yet structurally distinct private markets, namely, bottled water and household purifiers. Existing socio-cognitive market theories explain category stabilization but do not sufficiently account for cross-market co-evolution triggered by institutional shocks. We adopt a socio-cognitive perspective following Rosa et al. (1999), who conceptualize product markets as socially constructed knowledge structures shared by producers and consumers [5]. In this regard, markets emerge and change as actors collectively make sense of new technologies, risks, and needs. By analyzing how meanings of "drinking water" have co-evolved with stakeholder behaviors in Korea, we illustrate how market development is embedded in broader social and cognitive processes. Although our framework draws on Bandura's social cognitive theory and the socio-cognitive market model described by Rosa et al., our objective is not merely theoretical alignment. Instead, we analytically refine these frameworks by identifying institutional triggers as catalytic boundary conditions and by specifying cross-market coupling mechanisms [5–7]. In our context, consumer behaviors (e.g., adopting bottled water) and producer strategies (e.g., marketing "pure" water) influence each other reciprocally in response to external environmental cues (e.g., contamination news) and institutional changes. Such a perspective helps reveal feedback loops among public perceptions, corporate innovation, and policy interventions in the pursuit of sustainable water consumption.

Korea's bottled water market began as a small, imported niche in the 1970s and 1980s, but it expanded after highly publicized tap water contamination incidents in the early 1990s sparked public alarm [1,8–10]. Regulatory changes in the mid-1990s, especially the enactment and implementation of the Drinking Water Management Act, legalized domestic bottled water production and created a new market space [9,11]. By contrast, water purifiers entered Korean homes as luxury appliances in the 1980s and subsequently gained broader appeal in the 1990s as advanced filtration (e.g., reverse osmosis) became available and consumers sought more permanent solutions to their distrust of tap water. Over the 2000s, the two markets followed divergent trajectories: bottled water faced environmental regulations (e.g., waste charges, advertising restrictions) that tempered its growth, whereas water purifiers expanded rapidly through rental service models and technological innovations. Each market thus offers a distinct but related narrative of how stakeholders respond to sustained socio-environmental pressures (see Figure 1 and Table 1). By examining these narratives together, this study provides insights into adaptive strategies for sustainable water management in developed economies.

Using a qualitative, grounded theory approach, we analyze how these developments were driven by shifting socio-cognitive factors, especially consumer trust/mistrust, perceived health benefits, and evolving regulatory expectations. Our findings underscore that changes in how water is conceptualized as a product (from an essentially free public good to a commodified source of health and safety) were pivotal in both markets. We contribute to the sustainability literature by highlighting the role of meaning-making processes in enabling or constraining sustainable consumption. The discussion will elaborate on how

our results align with and extend prior research on product meaning dynamics [5,12,13] and social cognitive adaptation in organizational contexts [6,7]. Ultimately, by illustrating how Korean stakeholders negotiated the meaning of "safe water" over time, we provide lessons for managing similar transitions in other contexts of environmental uncertainty and resource management.

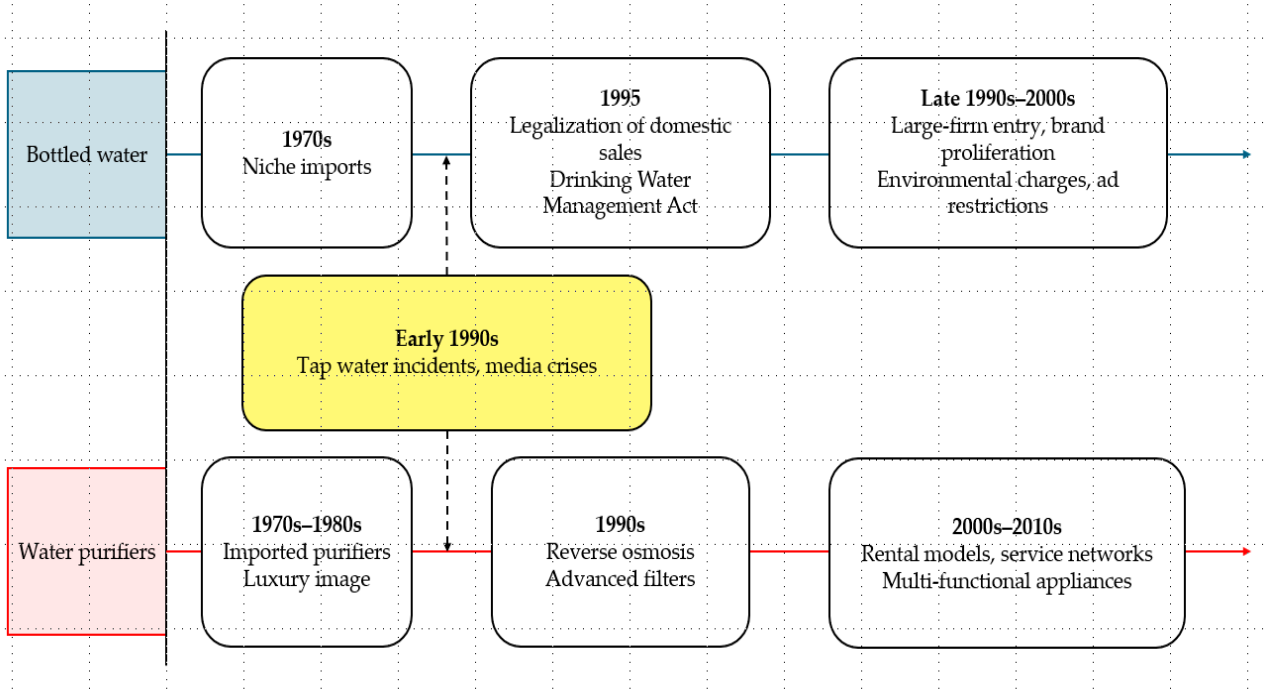


Figure 1. Timeline of major institutional and market events shaping the bottled water and water purifier markets in Korea.

Table 1. Comparative timeline of major events and strategic shifts in the bottled water versus water purifier markets.

Period	Bottled Water (Spring Water)	Water Purifiers
1970s to 1980s	Niche/limited consumption; premium/foreign use perception	Imported devices; luxury perception; limited diffusion
Early 1990s	Tap water incidents + negative news amplify distrust; latent demand	Tap water incidents raise interest; early quality issues covered by the media
1995	Legalization of domestic sales under the Drinking Water Management Act; regulatory barriers begin to emerge	Market diffusion: Reverse osmosis adoption accelerates
Late 1990s to 2000s	Large-firm entry; brand proliferation; environmental charges and ad restrictions shape strategy	Door-to-door sales → rental/service model; service networks institutionalize
2010s to present	Trust concentrates on a few brands, packaging/design innovation, and functional differentiation attempts	Multifunctional appliances; hygiene and smart features; quality management becomes key

2. Conceptualization: Literature Review and Theoretical Framework

2.1. Socio-Cognitive Dynamics in Product Markets

To avoid a fragmented theoretical structure, we integrate social cognitive theory, socio-cognitive market theory, cultural meaning analysis, and sustainability transition scholarship into a unified multi-level framework.

At the macro-interactional level, Bandura's theory of reciprocal determinism [7] conceptualizes mutual influence among behavior, cognition, and environmental events. In the Korean water context, contamination crises and regulatory reforms acted as environmental triggers that reshaped producers' and consumers' cognitive frames. In market settings, this means producers and consumers continually influence each other's perceptions and actions. Simultaneously, external factors (e.g., media reports or regulations) shape the context in which these actors make decisions. Reciprocal determinism suggests that, as consumers observe and model behaviors (such as choosing bottled water over tap water) and producers respond to consumer attitudes (by developing new products or marketing messages), a dynamic feedback loop is created [5,12]. This perspective informs our study by framing the bottled water and purifier markets as co-evolving systems shaped by iterative interactions among consumer trust, producer innovation, and environmental signals.

At the micro-cultural level, McCracken's meaning transfer model [14] clarifies how symbolic meanings are encoded into material artifacts and enacted in consumption rituals. Product meaning is therefore operationalized across three empirical dimensions: (1) linguistic encoding (advertising narratives), (2) material embedding (packaging, technological features, service infrastructure), and (3) ritual enactment (maintenance visits, household practices). To strengthen this integration, we draw on practice theory [15,16], which emphasizes that meanings stabilize when they are embedded in routinized socio-material practices. This layered integration provides a coherent analytical lens rather than an additive citation structure. Marketing scholars have long noted that the meanings of consumer goods are not static; they are constructed through cultural and social processes. McCracken's "movement of meaning" framework posits that cultural meaning flows from the culturally constituted world (shared values, norms) to consumer goods and then from goods to individual consumers [14]. In other words, advertising, media, and social discourse invest products with symbolic meanings (e.g., purity, modernity, status), and consumers, through rituals of use, internalize those meanings. Over time, new meanings can attach to products as society changes. In the context of water consumption, drinking water can carry meanings of trust and safety (when coming from one's own community tap or a known, clean source) or, conversely, risk and uncertainty (under fears of pollution). Similarly, bottled water may symbolize health and purity, or for some individuals, environmental wastefulness, while water purifiers may signify control over quality and technological progress, or conversely, inconvenience and cost. We expect that such meanings were pivotal in shaping the development of the Korean water markets. McCracken's work suggests that understanding where meanings come from—for instance, how "safe water" has become a commodified ideal—requires tracing the cultural and institutional channels through which meanings are transmitted [14]. In our study, the media and regulatory agencies serve as necessary "instruments of meaning transfer" by highlighting certain aspects of water (e.g., contamination, mineral content) and thereby shaping public perception.

At the meso-market level, Rosa et al. [5,13] conceptualize markets as socially constructed knowledge systems stabilized through iterative negotiation. However, classical socio-cognitive market theory does not explicitly account for institutional distrust as a destabilizing force that is capable of generating adjacent parallel markets. This study extends that perspective by examining cross-market socio-cognitive linkages between the bottled water and purifier sectors. Rather than viewing markets as predefined by technology or

purely by consumer needs, Rosa et al. suggest that producers and consumers jointly define what a product is through their interactions and communications. Early in a market's life, there is often ambiguity—a "cacophony of uses, claims, and product standards"—as different actors have different conceptions of the product's meaning and category membership [5,12]. Through feedback and sensemaking, a more stable shared understanding can emerge over time. Rosa et al. demonstrated this notion in the context of the minivan market, showing how language in trade press and popular media converged on a category label and prototype as the market stabilized. We expect a similar socio-cognitive process in Korean water markets. Specifically, as incidents, media narratives, and stakeholder actions unfolded, a clearer collective meaning of bottled water and water purifiers likely emerged. For example, in Korea's case, the term "drinking spring water" became the legal and popular term for bottled mineral water, reflecting a shift from seeing it as just imported water to a distinct category of daily consumer good. Similarly, the notion of a "water purifier" evolved from a luxury item to an essential appliance, prompting changes in how both producers and consumers conceptualized its value (from mere convenience to a health necessity).

2.2. Sustainability Pressures in the Drinking Water Domain

The evolution of product meanings in these markets did not occur in a vacuum; it was highly responsive to sustainability pressures and public perceptions of risk. Research on sustainability transitions suggests that external shocks, such as environmental crises or regulatory interventions, can trigger significant shifts in consumer attitudes and corporate strategies [17–20]. In social cognitive terms, such events are environmental stimuli that can alter cognitive schemas. In Korea, a series of highly publicized "water shocks" in the early 1990s, including the Nakdong River phenol spill and subsequent contamination reporting, undermined trust in the public water system [1,9,10]. These events offered powerful vicarious learning experiences for consumers regarding the risks of tap water, effectively serving as cautionary tales that shaped risk perceptions. Bandura's theory highlights how observational learning and negative outcome expectations can change behavior [6,7]; indeed, Korean households began boiling water or seeking alternatives after news of polluted tap water.

Producers, in turn, were observing these consumer reactions and media narratives. According to social cognitive theory, firms adjust their strategies in response to anticipated consumer needs (e.g., demand for safer water) and regulatory signals (e.g., new water safety standards) [5,12]. This adaptive behavior by firms in uncertain, changing environments aligns with Dickson's concept of dynamic competitive rationality [21]. Firms must continuously interpret market feedback and reconfigure their offerings to maintain relevance. We propose that Korean bottled water companies, particularly following legalization in the mid-1990s, had to rapidly build consumer trust by emphasizing natural purity and rigorous testing, thereby differentiating their product from suspect tap water. Similarly, water purifier companies needed to convince consumers of their technology's efficacy and address early quality failures that could tarnish the category's image. In this sense, purchasing bottled water or a purifier could be understood as a reallocation of trust from municipal supply to private providers. Korea-focused studies on tap water risk perception and national drinking water surveys indicate that perceived safety, institutional credibility, and quality assurance remain the central determinants of water choice [2–4]. Thus, we expect themes of trust and risk to be central in the narratives of both markets, alongside themes of health, safety, and environmental responsibility.

2.3. Research Model and Hypotheses

Bringing together the above theoretical strands, we conceptualize the bottled water and purifier markets as evolving through iterative socio-cognitive interactions (Figure 2). Producers and consumers each have their own conceptual systems—mental models of water products—that may initially differ. Through ongoing interactions, including marketing communications, user feedback, and media discourse, these conceptual systems influence one another, leading to shared meanings of new products across the market. External drivers (adverse media reports, changes in law, environmental events) act as triggers that can shift these conceptual systems, prompting stakeholders to modify their behavior or understanding. Over time, a cycle of mutual adaptation produces specific outcomes, in this case, market growth trajectories and (ideally) more sustainable practices (e.g., stronger safety standards, reduced single-use plastics, etc.). Figure 1 illustrates this framework, highlighting the key constructs identified in our study. Specifically, producer behavior encompasses technological innovation, branding, and service model development, whereas consumer behavior involves adoption decisions and usage patterns. Both are influenced by product meanings (such as "pure and safe" versus "risky or inconvenient") and by each side's evolving conceptual schema (producers' market strategy lens; consumers' evaluative criteria lens). The public tap water system provides a backdrop, as its performance and the public trust in it critically shape the perceived need for alternatives.

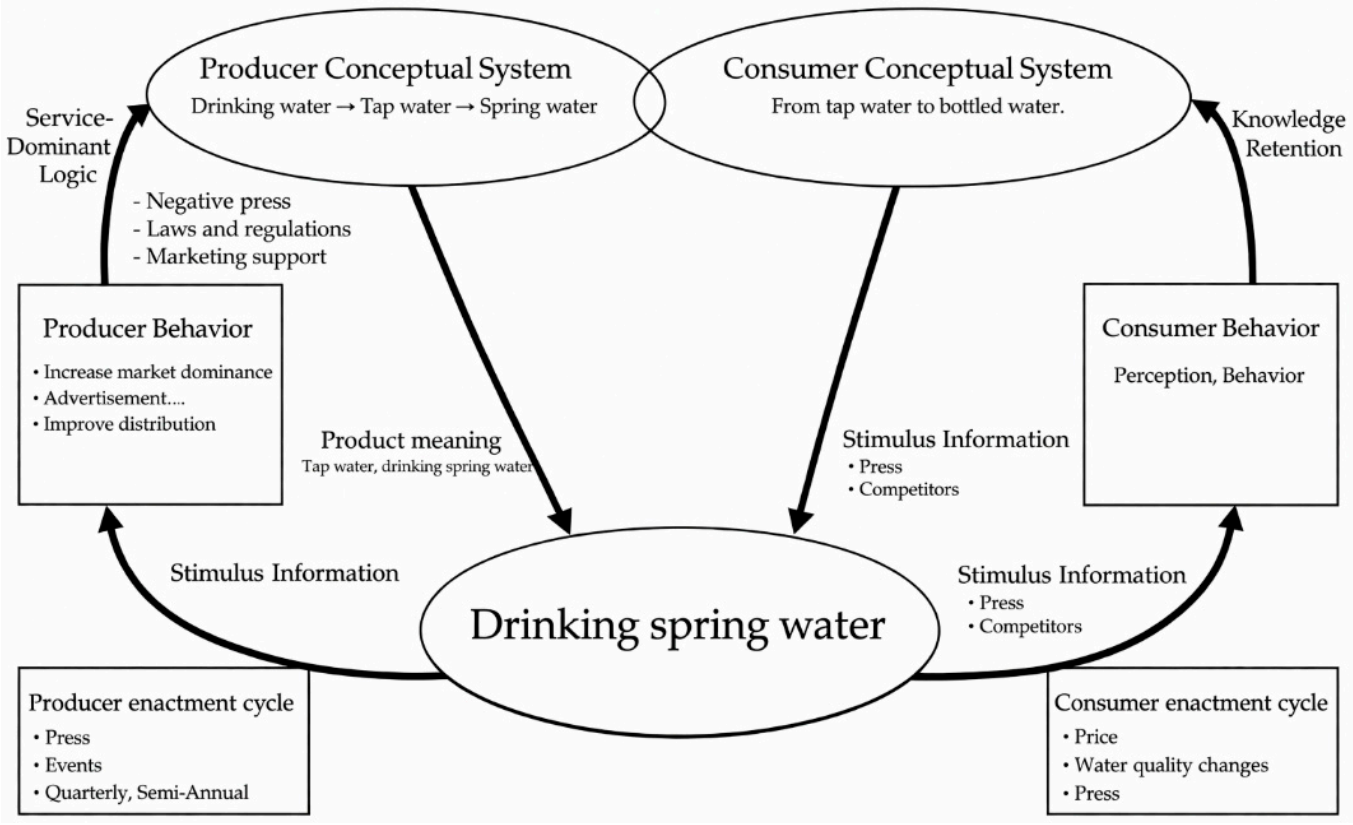


Figure 2. Emergent socio-cognitive model constructed through iterative grounded analysis.

Using iterative grounded analysis involving open, axial, and selective coding, we developed five analytical propositions (P1–P5). These propositions were not specified a priori; rather, they emerged from patterns identified in the stakeholder narratives and were refined through constant comparison. These propositions represent recurrent socio-cognitive interactional patterns rather than a linear causal model imposed before data analysis.

Proposition 1. *Institutional shocks (e.g., media-amplified contamination events and regulatory reforms) destabilize existing trust structures and prompt producer reinterpretation.*

In other words, crises and policy shifts prompt producers to view water differently; for example, they may see it as a commercial opportunity or a mandate for quality improvement, thereby influencing their decision to enter or alter the market. This hypothesis is grounded in observations that events such as contamination scares in the early 1990s led new actors to launch bottled water businesses and prompted existing purifier firms to overhaul their product standards.

Proposition 2. *Producers encode revised meanings into products and services.*

We posit that once producers perceive a new reality (e.g., "consumers need safer water"), they will modify their product strategies, such as introducing new technologies, marketing messages, or distribution channels, thereby effectively changing the meaning of their product from the producer's perspective. For bottled water, this could entail shifting from a luxury or import good mindset to positioning it as an everyday, safe alternative (with widespread distribution). For purifiers, it might involve moving from selling a one-time appliance to emphasizing ongoing service and purity assurance as the core value.

Proposition 3. *These producer-driven changes in product meaning subsequently influence consumers' initial conceptual systems.*

We propose that as producers market new meanings (e.g., "minerals for health" in bottled water or "certified clean water at home" in purifiers), consumers' perceptions and understanding of drinking water evolve. They may begin to see bottled water not just as a convenient beverage but as essential for health or status, and water purifiers not just as gadgets but as trustworthy guardians of family health. In short, P3 posits that producer innovations and messaging alter consumers' criteria and perceptions. For example, consumers begin to value attributes such as mineral content, design, brand reputation, or service quality in their water choices, where previously the choice was simply tap versus not-tap.

Proposition 4. *Changes in consumers' conceptual systems and product perceptions subsequently affect producers' subsequent behaviors and conceptual reframing.*

As consumers become more discerning and their preferences diversify (e.g., demanding "clean and natural" water or worrying about plastic waste), producers are pushed to respond with further innovations or adjustments. For example, bottled water companies might adopt new packaging (e.g., eco-friendly bottles) or launch functional water lines (e.g., vitamin-fortified, oxygenated) as consumers increasingly seek more than just "clean water". Water purifier firms might develop rental maintenance services and improve device aesthetics to address consumer concerns about hygiene and convenience. P4 essentially captures this feedback loop. Empowered with new product meanings and expectations, consumers in turn drive producers to develop new strategies and refine their market concepts.

Proposition 5. *The new producer and consumer conceptual systems converge to create a transformed shared product meaning in the mature market.*

In both markets, following these iterative changes, the product attains a relatively stable meaning (at least temporarily) that is recognized by both producers and consumers. For example, bottled water in Korea eventually came to be perceived as "healthy, pure

drinking water with added value" (often emphasizing natural minerals and safety) rather than just an alternative to tap water. Similarly, water purifiers came to embody "convenient, high-tech water safety service" rather than a luxury or experimental device. P5 anticipates that these culminated meanings incorporate elements salient to both producers and consumers, including health, safety, and even environmental consciousness, that were not part of the original conception of the products. In essence, a new equilibrium of meaning is reached that reflects collective learning over the market's evolution [5,12,13,21].

These propositions provide an analytic structure for our results. They are not statistically tested; instead, qualitative evidence is examined for consistency with each proposition, consistent with grounded theory methodology [22–24]. In the next section, we describe our methodology, followed by the results, organized according to the propositions above (P1–P5). Throughout, we integrate relevant literature to support interpretation, and we include figures and tables (e.g., code distributions and timelines) to substantiate our analysis.

3. Methodology

3.1. Research Design Including Sampling and Recruitment

We employed a qualitative research design, specifically following grounded theory methodology, to investigate the socio-cognitive dynamics in the water product markets [22–24]. Grounded theory is an appropriate method for use in this study because our objective was to develop insights and theoretical explanations from rich context-specific data inductively rather than to test predefined quantitative hypotheses. Grounded theory is a method that systematically yet flexibly builds theory from data, using iterative coding and comparison to identify patterns. This approach aligns with calls for more interpretive research in sustainable consumption domains, where complex social processes are at play.

Our primary data source was in-depth, semi-structured interviews with a diverse set of stakeholders in Korea's bottled water and water purifier markets. We conducted interviews with the following stakeholders: (1) industry producers, including 14 professionals from bottled water companies and 16 from water purifier firms (including founders, managers, and technical experts); (2) institutional experts, including 20 individuals from regulatory agencies, water research institutes, and industry associations; and (3) consumers, including 19 household users of bottled water and/or purifiers, representing various ages and backgrounds. In total, 69 interviews were conducted and analyzed (Table 2). Participants were recruited between March 2022 and December 2023 using purposive and snowball sampling techniques. Producers were identified through industry directories and professional associations. Institutional experts were contacted via regulatory agencies and academic institutions. Consumers were recruited through community referrals and screened for active use of bottled water or a purifier. The inclusion criteria required at least 5 years of relevant industry experience (for producers and experts) or consistent product use of more than 1 year (for consumers). No participant category was intentionally excluded.

The sampling was purposive and aimed at capturing the full spectrum of perspectives, ranging from those making and selling water products to those setting standards and those consuming the water. We also employed theoretical sampling as the study progressed: insights from early interviews guided us to seek out additional respondents (for example, after learning about a specific 1994 regulation from an expert, we interviewed a policymaker involved in that legislation to deepen our understanding). This process continued until we reached theoretical saturation, the point at which new interviews yielded no fundamentally new concepts or themes. Thematic saturation was assessed at the level of higher-order categories. After interview 64, no new conceptual categories emerged during open coding. Five additional interviews were conducted to confirm the stability of themes. Saturation was therefore evaluated at the thematic rather than purely coding frequency level. Notably,

Glaser and Strauss's criterion for saturation, which occurs when additional data no longer spark new insights, guided our decision to stop data collection [22].

Table 2. Profile of interview participants and rationale for selection.

Participant Category	Description	N	Selection Rationale
Bottled water producers	Founders/executives, senior managers in bottled spring water firms	14	Capture early market formation, regulatory interpretation, branding/production adaptations
Water purifier producers	Executives, engineers, service designers, parts suppliers	16	Capture technology evolution, rental/service model innovation, and quality management
Institutional experts	Regulators, researchers, and industry association members	20	Contextualize media influence, legal systems, and institutional trust
Consumers	Household users of bottled water and/or water purifiers	19	Understand lived experience, trust formation, and evaluation criteria

The key interview questions are presented in Table 3.

Table 3. The key interview questions.

Question Background	Drinking Water		Water Purifier	
	Question Content	**Interviewee**	**Question Content**	**Interviewee**
Social environment (Media)	What impact do you think negative media coverage has had on businesses?	Producer	Do you think that the reason you entered the water purifier industry was related to the social environment (negative media coverage)?	Producer, Expert
Law and System (Institution)	Please tell us freely what impact you think the law and regulations (drinking water management law) have had on the water industry.	Producer, Expert, Consumer	Do you think that your motivation for starting a water purifier business was related to the legal system?	Producer
Producer conceptual system	In the early days of the drinking water business, what kind of influence do you think it had on your product strategy and market expansion? Please tell us freely.	Producer	As the water purifier industry has expanded, what changes have you brought about as a producer?	Producer
Consumer conceptual system	Tell me why you chose drinking spring water and what you think about drinking spring water.	Consumer	What are the reasons for choosing a water purifier and what are your thoughts on water purifiers (consumers)?	Consumer

Table 3. *Cont.*

Question Background	Drinking Water		Water Purifier	
	Question Content	**Interviewee**	**Question Content**	**Interviewee**
Producer enactment	As consumer response increases, what strategies do companies establish to strengthen their competitiveness?	Producer	As consumers' standards rise, how do producers differentiate their products?	Producer
Consumer enactment	What are the most important issues to consider when choosing drinking water?	Consumer	In what ways do you think water purifiers are different and more advanced than in the past?	Consumer, Expert

In addition to interviews, we gathered secondary data to triangulate evidence of media and regulatory events. This included archival news articles, public health reports on water quality, and historical market research data (e.g., statistics on bottled water consumption over time). These sources provided context, such as the timing and impact of the 1991 phenol contamination incident or the market share growth following specific marketing campaigns. Although our core analysis was interview-based, these materials helped to validate key inflection points and were especially useful for reconstructing event timelines and framing the interview findings.

3.2. Analysis Approach

We followed the classic grounded theory analytic procedures of open coding, axial coding, and selective coding [22] to derive themes and relationships from the interview transcripts. All interviews were transcribed verbatim and analyzed using NVivo 15 software. Two primary coders independently conducted open coding and then engaged in axial coding sessions to refine higher-order categories. Coding discrepancies were resolved through negotiated consensus meetings. Rather than calculating statistical intercoder reliability, which is not fully aligned with constructivist grounded theory, we adopted reconciliation-based agreement to ensure conceptual coherence. First, in open coding, two researchers independently reviewed transcripts line by line to identify discrete concepts and assign initial codes. Examples of frequently coded concepts included "trust in tap water," "health benefits," "service convenience," "media influence," and "regulatory pressure." We coded incidents where interviewees described changes (e.g., "After the phenol incident, people wouldn't drink tap water at all", coded under media-induced risk perception). We also coded stakeholders' descriptions of their own thought processes (e.g., a producer: "we realized we weren't just selling water, we were selling trust"; codes: producer conceptual shift, trust emphasis).

Through constant comparisons, we examined similarities and differences in coding across interviews and stakeholder groups. As patterns emerged, we moved to axial coding, which involves grouping codes into higher-level categories and exploring connections [23]. For instance, codes such as "distrust of tap water," "safety concern," and "government assurances" were grouped under the broader category of perceived water risk/trust. Likewise, "innovating new filter," "obtaining certification," and "launching eco-bottle" fell under producer adaptive strategies. We continuously related these categories to one another, asking how one might influence the other (e.g., does perceived risk drive adaptive strategies, or does media influence moderate this?).

During axial coding, we were informed by our hypothesis structure but remained open to unexpected relationships. Grounded theory encourages allowing the data to shape the theory, so we treated P1–P5 as sensitizing propositions rather than rigid rules. As an

example, while analyzing the data, we discovered a category around "service culture" in the purifier market (frequent mentions of door-to-door service, maintenance trust, etc.) that became relevant to P4 (consumer influence on producer behavior), even though we initially did not explicitly hypothesize about service models. Therefore, we modified our understanding to incorporate this emergent theme [23,24].

Finally, during selective coding, we refined a coherent narrative that integrates the major categories and links them to our core phenomenon—the co-evolution of product meanings and market behavior. The "storyline" we arrived at centers on how trust and risk perceptions drove a cycle of actions and reactions among consumers and producers, gradually institutionalizing new meanings of bottled water and purifiers. We linked this core storyline to existing theories, thereby enhancing theoretical sensitivity. For example, we interpreted our findings through the lens of social learning (producers and consumers learning from each other and from media) and institutional theory (regulatory and normative pressures shaping actions), ensuring our grounded theory is connected to the extant literature.

Throughout the analysis, we employed strategies to ensure credibility and reliability. We performed member checks by sharing preliminary interpretations with a few interviewees (especially expert stakeholders) to confirm that our understanding resonated with their experience. We also used analyst triangulation, where team members cross-verified coding and interpretations; any discrepancies were discussed and resolved by revisiting the data. To enhance transparency, we maintained an audit trail of memos documenting our decisions on including specific codes and on forming hypotheses from the data. Where possible, we also align our qualitative evidence with external indicators (e.g., if an interviewee claims "bottled water took off after 1995," we verify that market data show a sharp increase after 1995).

By rigorously following the grounded theory methodology, we grounded our propositions in the empirical reality of the Korean water markets. The iterative nature of coding and the constant comparative method ensured that themes such as trust, safety, service, and sustainability emerged from the participants' own narratives rather than being imposed. In the next section, we present the results organized by the five propositions (P1–P5), interweaving illustrative quotes and observations. We also introduce visual summaries, notably Figure 3 and Table 4, to encapsulate key findings, such as media timelines and coding distributions. This combination of narrative and visual data aims to provide a comprehensive, evidence-backed account of the socio-cognitive dynamics at play. To quantify some of these changes, we coded the frequencies of key concept references by producers in interview transcripts. Table 4 and Figure 3 summarize the distribution of coded "meaning units" by actor and construct, comparing bottled water and purifiers.

3.3. Interview Protocols, Researcher Positionality, and Reflexivity

Two trained interviewers conducted semi-structured interviews using a standardized interview guide (1: perception of tap water safety, 2: interpretation of bottled water meaning, 3: interpretation of purifier meaning, 4: trust and institutional legitimacy, 5: environmental considerations, and 6: policy expectations). The interviewers received prior qualitative research training and engaged in post-interview debriefing sessions to minimize interviewer bias.

Given the interpretive nature of qualitative inquiry, we explicitly reflect on researcher positionality. The research team consists of scholars trained in marketing, sustainability, and socio-cognitive theory. This orientation enhances theoretical sensitivity but may have also shaped interpretive emphasis. To mitigate potential bias, we maintained an audit trail of coding decisions, conducted analyst triangulation, performed member checks with

selected expert participants, and actively sought disconfirming cases during analysis. These steps enhanced transparency and analytic rigor.

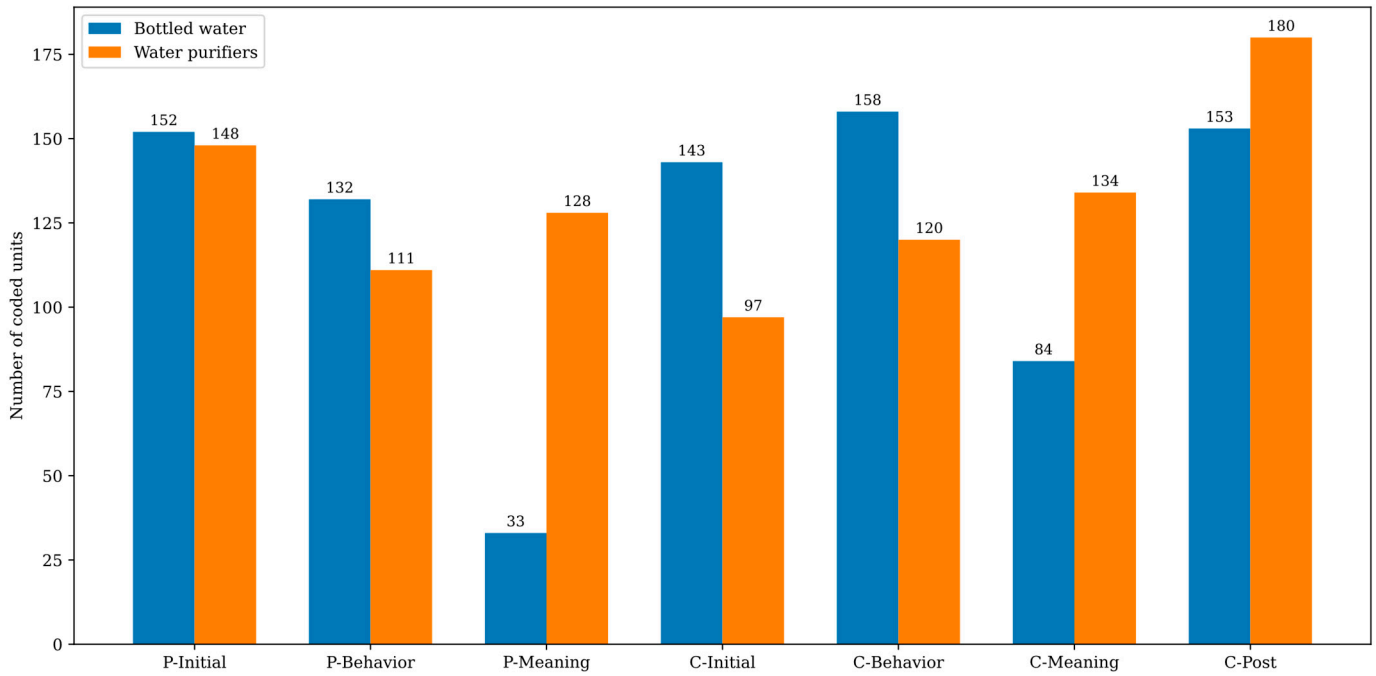


Figure 3. Distribution of coded meaning units by product category (bottled water and water purifiers), actor, and construct.

Table 4. Distribution of coded meaning units by product category, actor, and construct.

Product Category	Actor	Construct/Stage	Count
Bottled spring water	Producer	Initial conceptual system	152
	Producer	Producer behavior	132
	Producer	Conceptual system after recognizing product meaning	133
	Consumer	Initial conceptual system	143
	Consumer	Consumer behavior	158
	Consumer	Product meaning (interpretive meaning)	84
	Consumer	Conceptual system after recognizing product meaning	153
		Subtotal	955
Water purifier	Producer	Initial conceptual system	148
	Producer	Producer behavior	111
	Producer	Conceptual system after recognizing product meaning	128
	Consumer	Initial conceptual system	97
	Consumer	Consumer behavior	120
	Consumer	Product meaning (interpretive meaning)	134
	Consumer	Conceptual system after recognizing product meaning	180
		Subtotal	918

4. Results and Analysis

The results are organized around the five propositions (P1–P5) that trace the socio-cognitive dynamics in the Korean water product markets. For each proposition, we first outline the key findings and whether the hypothesis is supported, then present illustrative evidence from the interviews, and finally interpret the findings in the context of socio-cognitive theory and sustainability considerations. We differentiate, where relevant, between the bottled water market (often locally termed "drinking spring water") and the water purifier market, as both followed the proposed dynamics but with notable differences in outcomes.

4.1. External Shocks Reshape Producer Conceptual Systems (P1)

P1 posits that negative media coverage and regulatory changes alter producers' conceptual frames, effectively catalyzing the bottled water and purifier markets. Our findings provide strong support for this proposition. A majority of producer interviewees (24 of 30) referenced at least one external "shock" in the early 1990s as a turning point.

In the bottled water case, a manager recalled, "After the phenol contamination news in 1991, people here were desperately looking for clean water. We, as a food company, suddenly saw 'water' as something we could sell, which was new." At that time, selling drinking water was not an obvious business; water was generally considered a free public utility. However, the intense public attention surrounding the 1991 phenol spill and other widely reported tap water contamination issues in the early 1990s created a new public consciousness that potable water could not be taken for granted [1,9–11]. Figure 4 illustrates this trend. Specifically, spikes in tap water-related news coverage in the early 1990s coincided with a surge in interest in bottled water. The broader sequence of contamination reporting and legal reform in the mid-1990s was especially pivotal for legitimizing bottled water as a formal market category [9,11].

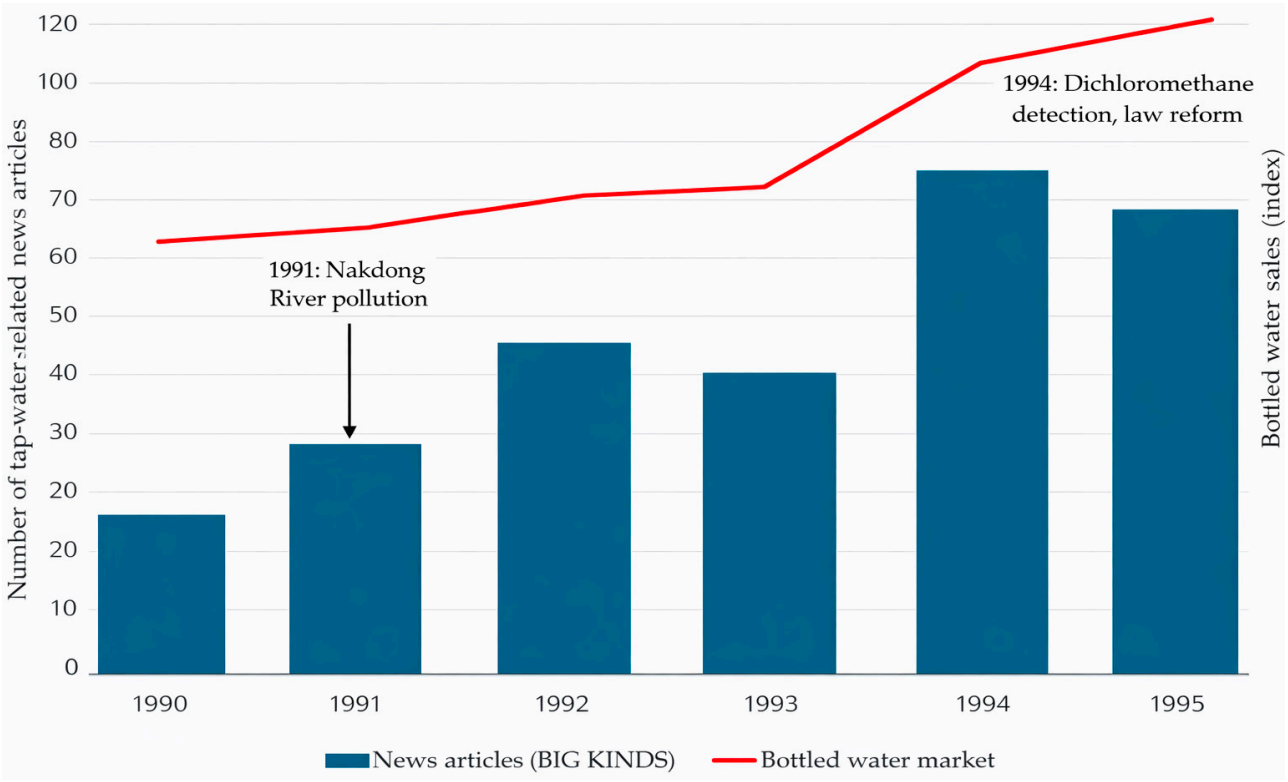


Figure 4. Tap-water-related news coverage and bottled water market growth in Korea.

Nine producer interviewees reported entering the bottled water industry between 1994 and 1996, explicitly linking their entry decisions to regulatory legalization: *"When the government allowed local bottling in '95, it was a green light. Before that, selling water felt like a grey market; after that, it became a legitimate business focused on safety."* Thus, policy and media worked in tandem to alter these producers' mindset from viewing water as a low-value commodity to seeing "safe drinking water" as a marketable product category requiring formal operations and marketing.

Key incidents (the 1991 phenol spill, subsequent early 1990s contamination reporting, and mid-1990s legal reform) heightened media attention, which aligned with the initial rise of the bottled water market [1,9–11].

For water purifier firms, P1 is supported as well; however, the mechanism is slightly different. Early purifier producers (1980s) were often importers or sellers of luxury filtration units to affluent homes. They reported that negative environmental news in the early 1990s broadened their target market: *"Suddenly, middle-class families were asking about purifiers. The news made everyone worry—even if they couldn't afford it, they were curious." One long-time engineer noted that around 1990, "we thought only fancy hotels and rich people would buy purifiers. But after those tap water scares, our concept changed—we started thinking every household might need one."* This conceptual broadening, namely, imagining the purifier as a mass market necessity, was a direct response to public outcry about water quality.

At the same time, regulatory scrutiny increased. Over time, formal quality inspection and certification systems for purifiers were institutionalized to address quality inconsistencies and strengthen trust in the category [25]. One CEO recounted being essentially forced by circumstances to improve product standards: "There were reports of sub-standard filters leaching chemicals. It became an existential issue—either we improve and prove our purifiers are safe, or the whole industry could collapse under distrust." Here, we see Bandura's reciprocal causation: environmental events (contamination) influenced producers' beliefs and behavior (investing in better filters, seeking certifications), which, in turn, were aimed at altering the environment of consumer perception (restoring trust) [6,7].

In summary, P1 is confirmed by evidence that external shocks were the impetus for producers' strategic pivots. Negative media coverage effectively delegitimized the tap water status quo and legitimized new water products in the eyes of both producers and regulators. As a result, producers reconceived their role. Bottled water companies emerged to provide what the public system ostensibly could not (reliable purity), and purifier companies shifted from niche luxury sellers to purveyors of a household utility. These shifts represent the first stage of socio-cognitive transformation, laying the foundation for the emergence of new markets. In both cases, a common theme was distrust in public infrastructure. Producers described riding a wave of consumer distrust that was not of their making, but opened a market window. This highlights a nuanced point: although the initial push came from outside (media, policy), producers' own cognitive frameworks (what they believed was possible or acceptable to market) had to adapt significantly. One might say that Korean producers had to unlearn the notion that "nobody sells water in a bottle" or "home water is the government's concern." They developed new schemas wherein providing trust became central to their product mission.

4.2. Producer Conceptual Change Drives Product/Strategy Innovation (P2)

Under P2, we expected that changes in producers' conceptual systems would manifest in concrete changes in product meanings and in the strategies producers advanced. The data show clear evidence of this notion, as producers in both markets undertook a flurry of innovations and repositioning efforts following the watershed moments of the early 90s.

Essentially, producers asked: *"If people now want safe water, how do we deliver and symbolize that?"* This led to new product features and marketing narratives.

In the bottled water market, the mid to late 1990s saw companies redefine what bottled water stood for. Initially, domestic bottled water brands emphasized source purity and naturalness. One pioneer brand manager stated, *"We chose our spring source in a remote mountain and made that our story—that this water is nature's gift, untouched."* This narrative was a deliberate strategy to differentiate bottled water from municipal water (which was associated with chemical treatment). By linking the product's meaning to pristine nature, producers gave bottled water an aura of health and purity that tap water lacked.

Another strategic innovation occurred in distribution and packaging. Traditionally, beverages were sold through retailers or distributors, but one interviewee noted, *"We had to get bottled water out everywhere—supermarkets, new delivery services, even online by the 2000s—so that it's always available when tap trust falters."* This expansion of channels (from corner-store sales to bulk delivery) indicated that producers were reframing bottled water as a daily necessity. They also experimented with package sizes (introducing 2 L family-size bottles, 500 mL on-the-go bottles) to integrate bottled water into various consumption contexts, effectively broadening its meaning from a travel or emergency item to an everyday hydration source.

Producers also made innovations in branding and product differentiation. As competition grew in the 2000s (many new brands entered after 1995), companies started to imbue their water with extra attributes, and the emergence of "functional water" lines is notable. For example, some brands added minerals and marketed their water as enhancing fitness or beauty. Internally, producers came to view themselves not solely as water providers but as part of the health/wellness industry. One company began an OEM (original equipment manufacturing) arrangement to supply store-brand bottled water to a major retailer, citing that *"even supermarkets wanted their own trusted water brand—it became like a staple food."* Such OEM deals were also a strategic response to supply shortages (demand sometimes outstripped the capacity of small producers). This confirms what P2 proposed, namely, producers' recognition of high demand and the trust premium led them to adopt innovative solutions, such as OEMs and new logistics, to ensure market coverage.

As one executive summarized, *"We changed everything—sourcing, production volume, marketing—all because suddenly water was a valuable product. We had to build credibility and stand out."* These changes in practice reflect a shift in the product's meaning from the producer's perspective: water was no longer "just water"; it was now a branded good, with purity, health, and trustworthiness as the core selling points.

In the purifier market, producer-driven changes were equally significant after the 1990s. Perhaps the most critical change was a move toward a service-oriented model. Traditionally, appliance makers sold purifiers as one-off products. However, as producers realized consumers were concerned about maintenance and filter hygiene (a theme that emerged strongly in our consumer interviews), they pivoted to a rental model with regular service visits. This innovation fundamentally changed the meaning of owning a purifier: it was no longer just a machine under your sink, but a service subscription that ensured continuous clean water. One veteran purifier company director described the internal conceptual shift: *"We stopped thinking of ourselves as selling devices in boxes. We started thinking we're selling clean water as a service—the machine is just the means."* This aligns with P2: the producer's concept of the product expanded to include service quality, which was subsequently incorporated into the product offering. As a result, by the early 2000s, many Korean purifier firms had large fleets of service personnel (often called "cody" or "coordinator" visits) who regularly exchanged filters and sanitized units in homes. This

strategy both added tangible value and also signaled to consumers that the company is partnering in their health—a message very different from a simple retail transaction.

Technologically, purifier manufacturers doubled down on filtration innovation. After recognizing that consumer trust was fragile, companies invested in R&D to develop multi-stage filters, UV sterilizers, and indicators that show water quality, all to reinforce the product's meaning of "safety and high-tech reliability." One engineer recounted how the design of purifiers changed: *"Earlier models were under-sink and hidden. Around 2000, we made countertop models with digital displays—it would show,* e.g., *TDS (total dissolved solids) levels, filter life, so that customers feel in control and informed."* This design shift made the purifier a visible part of the kitchen, arguably to normalize it as an everyday appliance and as a status symbol of a health-conscious home. Indeed, producers began advertising purifiers not only for health but also for convenience and a modern lifestyle (some ads featured stylish purifiers that matched kitchen decor). Thus, the product's meaning was enriched: it was about health, but also about modernity and care for one's family.

Producers in both markets emphasized "trust/safety" most frequently in interviews, reflecting their focus on product credibility. Water purifier producers uniquely stressed "service" (rental and maintenance), while bottled water producers more often mentioned "branding" and "environmental impact." Consumers in both markets frequently discussed "health" and "risk," aligning with producers' trust narratives. However, fewer mentions of "sustainability" were noted, unless prompted.

In conclusion, P2 is affirmed. Once producers reconceptualized the situation (P1), they proactively altered product attributes, business models, and messaging to redefine their product's meaning in the marketplace. They internalized that their role was to deliver not just water but also reliable safety, convenience, and, eventually, sustainability. This stage can be thought of as the proactive phase of market formation—the supply-side innovations that set the tone for how consumers will react next. Notably, these producer innovations laid the groundwork for educating consumers. By introducing, for example, scheduled service visits or eco-friendly packaging, producers implicitly set new expectations for consumers (e.g., "your drinking water provider should take care of you continuously" or "bottled water should be pure and green"). P3 addresses how consumers responded to and learned from these changes, which is discussed next.

4.3. Producer-Driven Changes Influence Consumer Conceptual Systems (P3)

P3 proposed that changes in product meaning instigated by producers would subsequently shape consumers' initial conceptual frameworks. Essentially, consumers would start to think differently about water and their choices. Our findings support this notion, showing a marked evolution in consumer perceptions and decision criteria over time, much of which can be traced to producer and media influences. In the interviews, consumers often framed their shift in behavior in terms of new attributes they came to value, many of which mirrored producers' marketing emphases.

One clear example is how quality differentiation became a consumer concept. In the 1980s, an average Korean consumer had a binary view: tap water (boiled or not) versus boiled barley water or some traditional beverage. The notion of gradations in drinking water quality did not exist. By the late 1990s, however, eleven of the nineteen consumer interviewees described choosing bottled water based on mineral content, taste differentiation, or brand reputation. As one consumer stated, *"Not all bottled waters are the same—Jeju volcanic water tastes smooth, and I prefer it for health minerals."* This type of statement reflects a consumer conceptual system that now includes product distinctions and personal preferences, something that did not exist a decade prior. The emergence of branded bottled

waters and their marketing (e.g., highlighting a calcium-rich mountain spring versus an oxygenated water) educated consumers that water could have various qualities.

Surveying our consumer interviews, consumer transcripts included repeated references to "clean" (n = 15 interviewees) and "natural taste" (n = 12 interviewees), indicating thematic salience rather than statistical generalization. This indicated that consumers had absorbed the producers' messaging about what makes water "better." One housewife mentioned she switched brands after reading a brochure about one water having lower sodium—a detail that suggests quite sophisticated conceptual engagement. This notion was arguably seeded by producers' information campaigns.

Consumers also developed concepts of risk and trust aligned with those addressed by producers. Initially, consumer mistrust was directed broadly at tap water (government-provided water). Over time, however, consumers learned to differentiate among alternative sources of trust. For instance, some consumers expressed strong trust in certain bottled water brands (often those that emphasized quality testing and source purity in ads), while remaining skeptical of lesser-known brands or even of the efficacy of water purifiers. A middle-aged interviewee's comment illustrates this point: *"I only buy Seoksu brand water because I know they test every batch. Cheaper brands, I worry they fill it from some tap."* Here, the consumer's conceptual model has expanded. Rather than "tap water = untrustworthy, bottled water = trustworthy," she differentiates within bottled waters based on perceived rigor—a nuance likely shaped by marketing and publicized quality certifications (some leading brands advertised their ISO quality certifications, which evidently remained in consumers' minds).

Similar concepts are highlighted with purifiers. Early on, many consumers either trusted or distrusted the idea of buying purifiers wholesale. However, by the 2000s, consumers would say things like, *"I trust Company A's purifier because their service man comes regularly, but I wouldn't trust a purifier if nobody maintains it."* This shows that the consumer's conceptual system now includes the notion of maintenance/service as part of trust, a notion that the service model innovation producers directly introduced.

Our coding analysis confirms that consumers started to value service and convenience factors, especially for purifiers. In interviews with late consumers of purifiers (late 2010s), these consumers frequently cited factors such as service response time, filter replacement frequency, and rental costs as reasons for their purchase decisions. These are not water quality attributes per se, but rather aspects of the product meaning that were created by producer strategy (the service model). In contrast, earlier consumers (late 90s) who bought purifiers often talked exclusively about the device's filtration ability or cost. The shift suggests that consumers learned to see a purifier not just as a machine but as an ongoing service relationship—precisely the reframing that producers intended. This learning likely occurred through experience (a service agent visiting and finding it valuable) and word of mouth (neighbors telling each other how convenient renting is). It underscores a broader point: consumer socialization into new product meanings. Families that adopted bottled water or purifiers often influenced relatives and friends by sharing their experiences, thereby diffusing the new concepts further. One expert noted in her interview, *"By the early 2000s, people talked about water quality at home gatherings, comparing notes on brands and methods. That was unheard of a decade prior."* Such social discourse is a sign that the cognitive category of drinking water solutions has firmly entered consumer culture, with a refined set of attributes to debate (e.g., brand X versus Y, purifier versus delivered water, etc.).

Another dimension of consumer conceptual change is the broadening of the set of categories consumers consider. Initially, tap water was the only category for most Koreans. As these markets emerged, consumers came to view "what is water for drinking" as a multi-category space: tap water, boiled tap water, bottled water, purifier water, and even various

functional or flavored waters. Our interviews with consumers who lived through the transition revealed how their household practices changed. Many described a progression. For example, in the 1980s, they drank tap or barley tea. In the late 90s, they started regularly buying bottled water for outings or children. By the 2000s, they installed a purifier at home for cooking and drinking but still bought bottled water for travel. In recent years, some even subscribed to a purifier service and bought specialty bottled waters (for mineral content or sparkling water, for example). This indicates that consumers did not simply replace one source with another; they diversified and assigned different meanings to each. One respondent said, *"We use the purifier daily for convenience, but I buy Jeju spring water for my baby because I trust that source more for purity."* This type of reasoning reveals a highly evolved conceptual framework in which multiple product meanings coexist: purifier water signifies convenient and reasonable, while bottled spring water signifies extra-pure for special care. It reflects the success of producers in creating nuanced product positions in consumers' minds (e.g., "natural mineral water" being a step above, in this case). It also highlights that consumers integrate new products into existing routines in a complementary fashion, guided by differentiated meanings (a phenomenon similar to what Rosa et al. (2005) [13] noted about product substitution versus supplementation in mature categories).

Regarding the core point of P3, we see that producer-induced changes (P2), such as new quality standards, marketing messages, and service offerings, indeed reshaped consumer conceptual systems. Consumers began to articulate their choices using the language of those new meanings (trust, purity, service, brand reputation, etc.), rather than "I boil water because I'm told to." The data suggest that by the mid-2000s, a large segment of Korean consumers perceived tap water as just one option among many, and often an inferior one. They had internalized a new hierarchy of water quality. This is a profound cognitive shift at the societal level: water, once homogeneous in public consciousness (H_2O from the tap), has become diversified, with varying attributes and symbolic values attached to each source.

Interestingly, our interviews also revealed some generational differences consistent with this narrative. Older consumers (who grew up before the 1990s) tend to express more astonishment or initial skepticism about buying water (*"It was strange to pay for water, but now we do,"* said a 70-year-old consumer). In contrast, younger consumers take it as given that water comes in many forms and that paying for safe water is normal. This indicates that the conceptual shift has become culturally embedded over time—younger people are effectively socialized in a post-tap-water trust world and thus do not need convincing in the same way. Producers no longer need to justify why one would buy water; they only need to explain which water product to buy. This is a testament to how thoroughly consumer mindsets changed in the first decade of the 2000s.

Summarizing P3, the evidence shows that producer-driven market changes led to new consumer knowledge and evaluative criteria. Consumers learned to seek out and value the attributes that producers had built into the product meanings (safety certifications, service reliability, brand integrity, etc.). This coalesced into consumers making more informed, deliberate choices regarding drinking water, reflecting a mature socio-cognitive state of the market. Essentially, by shaping what was offered and how it was presented, producers shaped what consumers came to want and expect. The socio-cognitive dynamic here is a classic teaching and learning loop: producers "taught" consumers what to care about (through advertising, product design, and even the availability of choices), and consumers "learned" and adjusted their preferences accordingly, which subsequently sets the stage for the next loop of influence (P4).

4.3.1. Materialization of Product Meaning (Related to P3)

In the bottled water market, the meaning of "purity" is materially encoded using mountain imagery, mineral composition labeling, and certification logos prominently displayed on packaging. Retail placement alongside premium beverages further reinforces the symbolic positioning. In the purifier sector, "trustworthiness" materializes through scheduled maintenance rituals, digital filter indicators, and visible service infrastructure embedded in domestic spaces. These meanings are not uncontested. Environmental NGOs frame bottled water as environmentally problematic, emphasizing plastic waste. Media amplification of contamination events intensifies narratives of distrust, often overshadowing infrastructural improvements. Therefore, meaning stabilization occurs within a contested discursive field.

4.3.2. Power Asymmetries in Meaning Making (Related to P3)

Although socio-cognitive theory emphasizes reciprocity, meaning construction unfolds within asymmetric resource structures. Corporate firms possess sustained advertising capacity and resources for technological innovation, enabling them to institutionalize narratives of purity and technological superiority. NGOs and civil society actors introduce counternarratives but lack comparable communicative reach. Media organizations function as amplifiers, disproportionately magnifying crisis discourse. Meaning convergence thus reflects both interaction and structural asymmetry.

4.4. Evolved Consumer Perceptions Influence Producer Behavior (P4)

Given that P3 establishes that consumers develop new expectations and perceptions, P4 examines how these evolving consumer conceptual systems feed back to alter producers' behaviors and strategies. Our findings indicate strong support for P4. As consumers became more discerning and their preferences crystallized, producers indeed responded with further adjustments and innovations, essentially fine-tuning the market in line with consumer feedback.

One prominent theme was how consumer demands for convenience and assurance drove producers to expand service and quality initiatives. By the mid-2000s, bottled water companies faced a growing segment of consumers who expressed concerns about the environmental impact of plastic bottles (as noted in interviews and consumer surveys by one industry association). In response, major bottled water producers began to adopt lighter-weight bottles, increasing the use of recycled PET, and even ran campaigns to encourage bottle recycling. One producer recounted, *"We started hearing from customers*—via *our website and consumer hotline—that they felt guilty about so many bottles. This pushed us to introduce our 'Eco cap' and reduce plastic in our bottles by 20% in 2008."* This illustrates P4: consumer values (sustainability concern) influenced concrete producer behavior (innovation in packaging). It also subtly shifted the meaning the producers tried to convey. Beyond purity, they wanted to signal eco-friendliness to align with consumer values.

In effect, consumers, having internalized the idea that water should be pure and healthy, extended this notion to "healthy for the planet too," and producers responded by integrating it into their offerings. Another bottled water example is the proliferation of sizes and formats—consumer convenience demands led to the introduction of smaller bottles (330 mL for portability) and bulk home-delivery boxes. When consumers began purchasing water in bulk for household use, companies began offering subscription delivery services (some in our data noted around 2010, when they became popular). This service innovation was a direct response to consumers' integration of bottled water into daily life (no longer just for outings, but as an at-home staple).

In the water purifier market, the P4 feedback loop is even more evident. As more consumers experienced purifier rental services, they began to expect high standards of customer service and ongoing product improvement. Many consumers, especially those who had used a purifier for several years, emphasized in interviews how crucial the company's responsiveness was: *"If my purifier has an issue, I expect a technician within a day. If not, I might switch providers."* Such expectations pressured companies to improve their service logistics (e.g., increasing the number of service technicians, using ICT for maintenance alerts). One firm's manager described how competition on service quality ramped up: *"Consumers would compare whose service visit was more prompt or who gave a free filter. We had to keep up—we introduced a 24-h call guarantee and started training our service staff to be more professional and friendly because that became a selling point."* This shift in emphasis on the service experience was not originally central to producers' thinking, but became so because consumers incorporated it into their decision making. As a result, by the late 2010s, marketing for purifiers often highlighted service awards or customer satisfaction rankings, indicating that producers were pivoting to meet the consumer's conceptual emphasis on service reliability.

Consumers also influenced product development. For example, several purifier users expressed a desire for more compact or aesthetically pleasing designs, as the bulky early models took up counter space and looked industrial. Producers took note. One interviewee from a design team said, *"We got feedback, especially from younger households, that the purifier should look nice in the kitchen. This led us to collaborate with designers for sleek styles and colors."* Indeed, by the mid-2010s, slim and chic purifier models entered the market, a departure from the utilitarian white boxes of old. Similarly, consumer feedback led to multifunction purifiers (the ability to produce cold, hot, or even sparkling water from a single machine) because consumers expressed interest in convenience and avoiding multiple appliances. As a concrete example, Company C launched a hot/cold purifier after surveys showed that many purifier owners still boiled water or cooled it for specific uses. Specifically, the company realized consumers wanted temperature options on demand. This reflects how consumer "wants" (convenience, multifunctionality) guided producers in reimagining their product's features, thereby expanding its meaning to "all-in-one water solution."

Another area of consumer influence was pricing and contract terms. Initially, purifier rentals were somewhat rigid (e.g., 3-year contracts). Consumers, gaining more options as multiple firms offered rentals, began to demand flexibility. Some consumers did not like long lock-in periods or wanted the option to upgrade. Sensing this, newer companies offered shorter contracts or upgrade programs, forcing incumbents to match. One industry expert noted, *"Consumers became savvy; they would switch providers if terms were better. This pushed the whole industry to be more customer-friendly in policies."* Consequently, producers' business models shifted to be more agile, with month-to-month plans, trial periods, and loyalty benefits introduced. This again is an example of producers changing behavior (business model innovation) in response to how consumers' conceptualization of a good deal or a trustworthy provider evolved (initially, consumers might have accepted any terms to get clean water, but later, they conceptualized the service as a competitive market where they hold power).

It is noteworthy that consumer voice via both direct feedback channels and market behavior became an increasingly important driver as the markets matured. Early on, producers inferred consumer needs; later, consumers explicitly communicated their preferences to producers. This dynamic is captured effectively by one producer's remark: *"By 2010, we basically co-created new products with our customers. We'd either pilot a new filter feature to gauge customer reaction or crowdsource ideas for the next model. They'd tell us if we hit the mark*

or not." Such co-creation is an advanced form of P4, where consumers' conceptual input is actively solicited to shape product design.

How often stakeholders referenced key concepts shed light on this interactive influence. Consumers, for instance, referenced "trust" and "safety" very frequently (15 and 10 mentions, respectively, in our coded segments for consumers), and producers likewise often referenced these concepts (8 and 12 mentions, respectively), indicating a mutual focus. "Service", however, was discussed asymmetrically. Consumers mentioned it moderately (5 mentions), whereas purifier producers mentioned it very often (about 10 mentions). This suggests that producers emphasized this concept to meet consumer expectations (and possibly to increase the salience of service in consumers' minds). "Environmental impact" was raised more by producers (especially bottled water producers, with five mentions) than by consumers (perhaps four mentions), suggesting that producers were responding to a nascent consumer concern and might potentially try to lead consumers to care more about it. This interplay of mentions underscores that producers and consumers were in a dialogue of sorts, each influencing what the other discussed and valued.

Overall, P4 is validated by the adaptive moves producers made in response to the more sophisticated and assertive consumer base that emerged. The relationship became less one-sided. Initially, producers led the way (by telling consumers why they need these products); however, in later stages, consumers led by saying, *"this is how we want those products to be."* The socio-cognitive dynamic matured into a type of equilibrium-seeking behavior—the market participants negotiating an optimal state that satisfies consumer desires and producer capacities.

This iterative feedback ultimately set the stage for P5, as the producers' and consumers' conceptual systems moved closer together, integrating one another's influences. By continually responding to consumer input, producers effectively aligned the product's meaning with consumer values. In the following section (P5), the outcome of this convergence is discussed. This includes the new shared understanding of bottled water and water purifiers that became established in Korea and how that shared meaning reflects both parties' contributions.

4.5. Convergence into New Shared Meanings (P5)

P5 posits that the result of the iterative producer–consumer interactions would be a new, stable shared meaning of the product from both perspectives. The evidence supports this. By the mid-to-late 2010s, both producers and consumers in Korea appeared to have reached a consensus on what bottled water and water purifiers represent and their role in daily life. This new consensus is markedly different from the initial state decades ago.

For bottled water, the shared meaning that emerged can be summarized as *"a convenient, healthy, and trustworthy source of drinking water, albeit with environmental considerations."* Producers and consumers both talk about bottled water in these terms now. In the interviews, when asked why people drink bottled water, producers and consumers alike cited safety and health first, followed by taste and convenience. Notably, no interviewee (either side) framed bottled water as a luxury or frivolity. This is a stark change from the early days when even policymakers dismissed it as unnecessary since Korea had treated tap water. An expert interviewee observed, *"Bottled water has become normal—it's considered a basic grocery item."* This normalization is a sign of shared understanding. Rosa et al. (1999) described how a product market stabilizes around a prototype or normative understanding [5]. In Korea, the prototype for bottled water became something like a 2-L bottle for home use or a 500 mL bottle for on-the-go convenience. The acceptability of that practice is now generally unquestioned, with the exception of environmental critiques that producers acknowledge and incorporate (e.g., through CSR campaigns for recycling).

Interestingly, producers and consumers also converged on an understanding of tap water's role relative to bottled water. Although there was an initial debate about whether bottled water is truly needed, by the 2020s, the dominant narrative—reflected in interviews and public survey evidence—is that tap water is acceptable for non-drinking uses or for boiling, while many households still prefer bottled or purified water for direct drinking [3,4,26]. One regulator admitted, "It's hard to change minds now; bottled water is seen as safer by default." This statement indicates how entrenched the new meaning is. Safety is an inherent quality of bottled water in the social mind. Producers, for their part, see their mission as continuing to uphold that safety and improve sustainability, rather than convincing people to drink bottled water in the first place—demand is assumed. Therefore, the discourse shifted from "why drink bottled water" to "how to drink bottled water responsibly."

For water purifiers, the shared meaning coalesced around the idea of *"an essential home appliance/service for ensuring safe and convenient water."* Both consumers and producers commonly consider purifiers an almost-necessity in modern homes (especially in urban Korea). One consumer said, *"A purifier is as common as a refrigerator now. You move into a new apartment, you usually get one." A producer echoed that sentiment: "In new housing ads, they often show a built-in water purifier; it's become part of expected amenities."* This alignment shows that the concept of a purifier has shifted from exotic to mundane. This is a classic sign of convergence in meaning (the product is fully institutionalized). The "service" aspect is also part of the shared meaning. People understand that owning a purifier means a subscription with regular maintenance. Far from being seen as odd, this is considered wise. For example, consumers brag about how responsive their purifier service is, much like they would about an internet provider or a car service center. Thus, producers and consumers together evolved the purifier category into a service-centric utility concept.

Crucially, this final meaning incorporates elements that were initially absent but were later introduced through the socio-cognitive process. For instance, the idea that drinking water should contain natural minerals (rather than be just pure H_2O) has become part of the bottled water narrative due to producers' emphasis, and consumers in our interviews often reproduced that belief when explaining their choices.

Regarding purifiers, the notion that regular professional maintenance is required for truly safe water is hammered by producers (often to differentiate from DIY filter pitchers), and consumers have come to agree—many mentioned they *"don't trust those simple filters, you need the company to handle it."* Thus, the final shared meanings are richer and more complex than the initial ones (namely, tap water versus not tap water). They embed the lessons learned over the market's evolution: trust needs to be maintained (so certificates, maintenance, seals of quality are valued), water can have enhanced value (minerals, temperature, carbonation), and consumption has broader implications (like environmental footprint; this is why consumers appreciate that a purifier reduces bottle usage or that bottled water companies engage in recycling programs). Indeed, one could argue that the shared meaning for each product now includes a sustainability dimension. Consumers often see purifiers as the environmentally friendly choice (no plastic bottles), a point that purifier producers naturally highlight. Conversely, the environmental impact of bottled water has a slight negative tint, which producers are trying to counterbalance with green initiatives. Both sides acknowledge this aspect. For example, consumers said they feel *"a bit bad using so many bottles," and producers said, "we know we have to address the plastic issue to keep customers feeling good about using our water."* Although not perfectly resolved, the fact that both stakeholder groups are cognizant of it and are discussing it shows that it is part of the mutual understanding of what the product category entails in today's world.

To illustrate the extent of this convergence, consider the language used by both stakeholder groups. In the interviews, when describing bottled water, consumers and

producers alike used terms such as *"clean," "healthy," "portable," and even "tastes good."* Essentially, consumers had adopted the marketing vocabulary, and genuine consumer concerns (taste, health) were reflected in marketing, indistinguishably. Regarding purifiers, terms like *"convenient," "always available,"* and *"peace of mind"* appeared on both sides. An expert noted that the discourse about water in Korea had changed fundamentally: *"We used to talk about foreign matter in tap water; now people talk about maintenance and service for water—that shows how the conversation shifted to maintenance of purity rather than assumption of impurity."* In other words, rather than fearing unseen contaminants (which was the focus in the early 90s), the shared focus currently is on actively keeping water clean through proper management (via either trusted brands or devices). This indicates a mature collective understanding that water safety is an ongoing process, underscoring why these products exist. This is a more nuanced, perhaps more empowered stance compared to initial fear and knee-jerk avoidance.

The support of P5 also implies that the Korean water markets have reached a relatively stable state. Indeed, by the late 2010s, the growth rates of both markets stabilized, and dramatic changes became less frequent. Bottled water became a stable, regulated industry with a few dominant brands; water purifiers were also ubiquitous with a few major service providers. The co-evolved meanings likely contributed to this stability. Everyone knew what to expect and what was expected of them (consumers expected safe water and service, while producers knew how to deliver that consistently). This does not mean a lack of innovation (e.g., IoT-connected purifiers are an emerging trend, and bottled water brands experiment with biodegradable bottles). Instead, these examples represent incremental improvements consistent with the shared narrative, rather than radical shifts.

One could reflect on whether these shared meanings align with sustainability goals. Arguably, the new meanings carry both benefits and drawbacks for sustainability. On the one hand, a society reliant on bottled water can be seen as unsustainable (plastic waste, energy for bottling, and transport). On the other hand, the focus on safety and health might drive investments in overall water quality improvements (indeed, the government did not sit idle; it significantly improved tap water standards in response to competition, as one expert pointed out). Regarding purifiers, the appliance approach has its own environmental costs (manufacturing, electricity, filter waste). However, it eliminates single-use plastic. Therefore, in Korea, it is often touted as the long-term eco-friendly choice. The shared meaning of purifiers as essential might reduce public support for municipal investments (if everyone handles it privately), which is a double-edged sword from a sustainability perspective. These broader implications are discussed in the next section. It is clear from P5 that the socio-cognitive process we traced resulted in a relatively unified producer–consumer outlook on these products, serving as a testament to how mutual adaptation and continuous feedback can lead to market stabilization in terms of meaning and practices [5,12,13,21].

Overall, our analysis across P1–P5 paints a comprehensive picture of how Korea's bottled water and water purifier markets evolved through social cognition. We saw initial external triggers (P1) altering producer mindsets, leading to strategic innovations (P2), which reframed consumer perceptions (P3), prompting further producer responses (P4), and culminating in a new equilibrium of understanding (P5). Throughout, the interplay of media, regulation, and market actors was critical. Indeed, our findings resonate strongly with the notion reported by Rosa et al. (1999) that markets develop through stories and feedback rather than by any one actor's design [5].

Moreover, although both markets emerged in response to distrust in tap water, their socio-cognitive trajectories diverged in key respects (see Table 5). The bottled water market stabilized around brand concentration and natural purity narratives, whereas

the purifier market institutionalized service-based trust through maintenance rituals and technological visibility.

Table 5. Comparative socio-cognitive dynamics across markets.

Dimension	Bottled Water	Water Purifier
Primary trigger	Media-amplified contamination	Household-level distrust
Meaning encoding	Natural purity narrative	Technological reliability narrative
Materialization	Packaging and labeling	Service rituals and digital displays
Sustainability tension	Plastic waste	Energy use and filter disposal
Stabilization mechanism	Brand concentration	Service institutionalization

In the next section, we discuss these findings with regard to their theoretical contributions and practical implications, particularly focusing on sustainability aspects. In addition, we highlight what this case teaches about guiding socio-cognitive change toward positive environmental outcomes.

5. Discussion

5.1. Theoretical Implications: Social Cognition in Market Evolution

Our study provides an analytical refinement of socio-cognitive market theory by specifying boundary conditions and mechanisms observable in the Korean water context. We provide an empirical illustration of Bandura's social cognitive theory in an applied marketplace context, showing how reciprocal determinism unfolds between firms and consumers [5–7,12,13]. The Korean water markets highlight that neither consumers nor producers alone dictated outcomes; rather, their continuous interaction, mediated by environmental signals, shaped the trajectory. This aligns with the findings of Rosa et al. (1999) that product markets are co-constructed using feedback loops [5,12,13]. However, our work adds nuance by explicitly incorporating institutional actors (regulators) and cultural factors (risk perception, sustainability ethos) into the socio-cognitive model. In doing so, we echo and build on the work of Bandura (1986) [7], who argued that organizational practices (here, industry behavior) are influenced by cognitive and environmental factors in tandem [6]. In our case, regulatory changes served as external stimuli that altered cognitive frames (e.g., legalization in 1995 suddenly made "water as product" cognitively legitimate for businesses and consumers). Rather than proposing a new theory, we clarify how institutional shocks accelerate socio-cognitive reconfiguration across adjacent markets. Specifically, we contribute by (1) identifying institutional triggers as catalytic boundary conditions, (2) theorizing cross-market coupling mechanisms, and (3) demonstrating how service institutionalization stabilizes trust narratives in mature markets. In addition, our contribution lies in specifying how institutional distrust functions as a catalytic boundary condition in socio-cognitive market evolution. By integrating macro-level reciprocal determinism [7], meso-level socio-cognitive stabilization [5,13], micro-level meaning materialization [14], and contemporary sustainability transition scholarship [17–20], we provide a multi-level explanatory framework for market formation under infrastructural uncertainty. Further, our findings refine socio-cognitive market theory within specific boundary conditions: a developed economy context, high media penetration, and institutional distrust in public utilities. The analytical propositions should therefore be interpreted as context-grounded refinements rather than universally generalizable claims.

Our findings also bridge consumer culture theory via McCracken's meaning transfer model [14]. We demonstrated the cultural construction of product meanings in real time.

Initially, the meaning of safety moved from the culturally constituted world (a society increasingly valuing health and purity) into the products themselves (bottled water marketed as pure and purifiers as guaranteeing safety). Then, that meaning was experienced and reinforced by consumers in rituals of use (daily drinking). We found evidence of the two-stage flow McCracken described: media and advertising transmitted meaning to the product, and consumers' use and word of mouth spread it into their personal lives. For example, the idea of *"bottled spring water from Jeju = wellness"* started as a marketing story but became a personal belief for many consumers. Over time, as predicted by McCracken, the product's meaning stabilized in the culture, such that even without advertising, people attribute certain meanings to it (e.g., pouring guests bottled water is seen as considerate, indicating how social norms around the product have taken hold). By applying McCracken's framework, we underscore that product meaning co-evolution is simultaneously a cognitive and cultural phenomenon—cognitive in how individuals process and react (as our grounded theory approach captured) and cultural in how these meanings become shared and taken for granted.

Another theoretical contribution lies in demonstrating grounded theory's value for research on sustainability and market dynamics. Our use of grounded theory allowed us to uncover emergent themes like trust, risk, and service, which might not be fully accounted for in existing models of sustainable consumption. Grounded theory scholars like Charmaz (2014) emphasize constructing theory from lived experiences [24]. For example, we found that "trust in infrastructure" is a pivotal construct that mediates whether a population will accept public resources or shift to private market solutions. This resonates with broader contexts (e.g., trust in public food safety versus organic market growth). Thus, one implication is that socio-cognitive dynamics can serve as a lens for examining other sustainable product domains, such as renewable energy adoption, where trust in the grid versus home systems might play a similar role. Our iterative, data-driven approach can serve as a template for researching those domains, ensuring that theory captures the voices and conceptual frames of all stakeholders, not just top-down assumptions.

Furthermore, our results enrich social cognitive theory by highlighting the role of collective efficacy and collective meaning-making. Bandura's work often focuses on individual efficacy beliefs [6,7]. However, our findings point to a form of collective efficacy: consumers banded together (through discourse and demand) to push companies to provide better solutions, and producers collectively improved offerings that provided consumers greater control over water quality. This back-and-forth enhanced the overall collective confidence that clean water can be ensured, albeit by new means. Wood [6] and Bandura (1986) [7] discussed how modeling and mastery experiences in organizations shape behavior [6,7]. Analogously, Korean society underwent a collective learning (through media "modeling" crises and then seeing successful private solutions), which subsequently shaped normative behaviors (it became normative to boil water or get a purifier after seeing others do so). Our study thus underscores that collective learning processes may contribute to sustainability transitions, as communities learn by observing outcomes and adjusting practices accordingly.

5.2. Sustainability and Socio-Cognitive Dynamics

From a sustainability standpoint, our findings carry both cautionary and hopeful notes. On the one hand, the socio-cognitive trajectory we documented led to the widespread adoption of bottled water and purifiers—solutions that have their own environmental footprints. The perception of tap water's unsustainability (due to health risk) drove consumers to alternatives that, in aggregate, may be less sustainable (plastic waste, higher energy use). This suggests a paradox: *improving perceived sustainability (personal health safety)*

can occasionally conflict with broader environmental sustainability. Policymakers should be mindful that purely emphasizing individual risk can spark market shifts that create other environmental burdens. In Korea's case, one might argue that a more sustainable approach would have been to invest even more heavily in rebuilding trust in the public water system (thus avoiding the need for so much bottled water). However, such trust-building is easier said than done. As our study shows, once broken, trust is difficult to fully restore, and socio-cognitive momentum tends to maintain new patterns.

On the other hand, there are positive sustainability implications. The water purifier market, while propelled by trust deficits, actually offers an example of a sustainable product-service system. Rather than millions of plastic bottles, many consumers get water through a durable appliance and a service loop, which is arguably a more resource-efficient model. This reflects how socio-cognitive dynamics can unexpectedly align with sustainability. The concept of rental and maintenance arose to ensure quality, but it also fits the circular economy ideal (maintenance extending product life, centralized filter recycling, etc.). This can be understood as a form of "sustainable innovation" that emerged from market dialogue. Although not originally intended to be eco-friendly, it now serves that function. For example, experts noted that PET bottle waste in Seoul decreased as purifier adoption grew, a collateral environmental benefit. As previously mentioned, however, although purifier adoption may reduce single-use plastic consumption relative to bottled water, this study did not include life-cycle environmental measurements. Sustainability implications are therefore interpretive rather than metric-based. Future research should integrate environmental impact assessments and life-cycle analysis to evaluate socio-cognitive transitions alongside measurable ecological outcomes. Meaning-making processes may be leveraged by policymakers to reduce plastic consumption (e.g., reframing refillable water practices as socially responsible) or to strengthen trust in public infrastructure through transparent certification mechanisms.

Our results also illustrate the importance of media and communication in steering sustainable behavior. The media essentially "programmed" consumer fears in the early 90s (Table 1), leading to the adoption of bottled water. However, media and civil society also later raised environmental concerns (reports on plastic pollution, etc.) that started to influence consumers (albeit to a lesser degree than health concerns). This indicates that sustainability narratives can be injected into the socio-cognitive cycle. If, for example, media and producers emphasize the sustainability advantages of purifiers (no plastic, local filtering) more strongly, it could further sway consumers toward that option over bottled water. We observed some producers doing this (one purifier firm's marketing explicitly targeted bottled water users, highlighting waste reduction). *Thus, one actionable insight is that shaping the narrative is key to steering markets toward sustainable goals. Stakeholders who want to promote sustainability (including regulators and NGOs) should engage in the meaning-making process, effectively competing in the cognitive marketplace of ideas.* In Korea's case, NGOs eventually campaigned for tap water as the most eco-friendly option (with mixed success). The lesson is that sustainability must be woven into the product's meaning in consumers' and producers' minds to gain traction. Experts (including NGO voices) discussed sustainability far more than consumers did. Bridging that gap by integrating environmental values into mainstream consumer discourse remains a continuing challenge.

5.3. Managerial Implications for Industry and Policy

For industry practitioners, especially those in sectors related to health, safety, and sustainability, our study underscores the value of staying attuned to socio-cognitive shifts. Companies should monitor not only consumer behavior but also the rationales and narratives consumers use, as these often foreshadow market changes. In our case, firms that

recognized early the trust issue (and, for example, had their bottled water certified by authorities or advertised stringent testing) gained a competitive edge by aligning with consumer anxieties. Similarly, purifier companies that realized they were selling "peace of mind" as much as devices moved ahead of those clinging to a pure sales model. The implication is that firms should deliberately define their product's meaning and be willing to pivot it as the shared understanding evolves. This might involve rebranding or business model innovation. For instance, a bottled water company today might rebrand itself not exclusively on purity but also on sustainability commitments to resonate with a slowly greening consumer mindset. If we consider Bandura's notion of modeling [7], companies can model desired behaviors for consumers (e.g., a campaign showing a family refilling a reusable bottle from a purifier, thereby modeling sustainable practices). By doing so, companies do not just respond to meaning; they help shape it. Our findings show producers did shape meaning (inadvertently or purposefully). Going forward, they might do so with explicit sustainability goals in mind.

For policymakers and regulators, our findings suggest that interventions in market dynamics should consider the socio-cognitive element. Regulatory changes associated with Korea's Drinking Water Management Act helped legitimize bottled water as a formal market category and signaled that drinking water governance was being restructured [9,11]. Regulators thus hold power not only to control market externalities but also to validate or invalidate product categories. If a government is concerned about plastic waste, for example, simply taxing bottled water (an external incentive) might not suffice; they may also need to run campaigns to alter the perception of bottled water's necessity. Conversely, they could bolster the image of tap water through transparency and publicized quality improvements to reclaim consumer trust (essentially trying to reverse some of the socio-cognitive trajectory we observed). Our findings caution that once public perceptions harden, they are difficult to reverse. Our findings suggest that proactive risk communication and transparent crisis management may help mitigate the long-term amplification of distrust, particularly when contamination events receive extensive media attention. Korea's experience suggests that if public trust in sustainability-critical infrastructure falters, the market may bypass it, creating new challenges. Given evidence that distrust catalyzed private-market substitution, policies that strengthen transparency, third-party certification, and public data disclosure may reduce the likelihood of trust displacement effects.

In a broader sense, our research speaks to the management of organizational knowledge and stakeholder engagement. The co-creation of meaning between companies and consumers, as seen here, is akin to stakeholder co-innovation. Firms in other sectors (e.g., renewable energy technology, organic foods) could benefit from engaging lead users and consumer communities in dialogue to shape product development, as occurred naturally with water purifiers, according to P4. This process, however, could be formalized. Uncertainty is reduced when a company understands the evolving narrative among its customer base.

5.4. Limitations and Future Research

Although our study provides comprehensive insights, it also has limitations that open avenues for further research. First, our analysis is context-specific to Republic of Korea, a country with high media connectivity, rapid economic development, and particular cultural attitudes toward health and technology. Cross-cultural studies could examine whether similar socio-cognitive dynamics occur elsewhere and, if so, how they differ. For example, in countries where public trust in infrastructure remains high, do bottled water markets fail to develop, as seen in some European countries? In places with different cultural beliefs about water (spiritual or traditional values), how do those mediate the

meaning-making? Comparative research can enrich the theoretical framework by adding cultural and institutional variables.

Second, our method was qualitative and, to a degree, retrospective. Longitudinal quantitative studies could complement this by measuring changes in consumer attitudes over time alongside media sentiment analysis to more precisely assess causality and effect size. For instance, sentiment analysis of news and social media could quantify the "trust sentiment" and correlate it with sales of water purifiers or bottled water. This would build on our work by adding predictive power and external validity.

Third, future research should examine the post-convergence phase: once shared meanings are established, what drives further change? Are they stable indefinitely, or could a new disruption (say, a major environmental campaign or a new technology such as home water testing IoT devices) upset the equilibrium? Rosa et al. (2005) discuss how even mature markets can experience "trigger events" that prompt new socio-cognitive cycles [13]. In our context, potential triggers could include climate change impacts on water supply or a significant innovation in public water treatment designed to regain consumer trust. Studying such developments would test the resilience of the socio-cognitive equilibrium we identified.

Finally, our research has primarily focused on the positive or adaptive aspects of these dynamics (the market providing solutions desired by consumers). However, a critical question remains: what about those left behind? Bottled water and purifiers cost money; lower-income households might not be able to afford them and thus continue to rely on tap water. If the majority of society adopts private solutions, there is a risk of institutional neglect of public water systems, thereby increasing inequality. Investigating the socio-cognitive dynamics through an equity lens by examining who participates in meaning-making and who has a voice would be a valuable extension. In our interviews, most consumers belonged to the middle class; future work should include marginalized voices to assess whether their meanings differ (e.g., perhaps some trust tap water because they must, or use alternative methods like rainwater). This information could inform policy on ensuring sustainable solutions are inclusive.

6. Conclusions and Implications

This study examined how product meanings and stakeholder behaviors co-evolved in Korea's bottled water and water purifier markets under the influence of media, regulation, and market dynamics. Using a grounded theory analysis of rich qualitative data, we traced the socio-cognitive journey spanning initial distrust in public systems, entrepreneurial innovation, consumer adaptation, and eventual market stabilization with new shared understandings of what "drinking water" entails. Our findings confirm that socio-cognitive factors, including perceptions of risk, narratives of trust, and cultural values of health and convenience, are not just background variables but central drivers of market trajectories.

For researchers, our work underscores the value of integrating perspectives from social cognitive theory, consumer culture theory, and grounded, context-specific analysis to unravel complex sustainability transitions. Markets for essential resources like water are not purely shaped by objective utility or price but by how people think and feel about those resources. In Korea, a shift in the collective mindset regarding water quality catalyzed the emergence of two substantial industries. Understanding such phenomena can help design interventions for other sustainability challenges, including energy, food, and waste management, where public perception and trust are critical.

For practitioners and policymakers, a key takeaway is the importance of maintaining public trust and proactively managing the narrative around essential services. Once trust in tap water was compromised, consumers exercised agency by seeking alternatives; the

"genie of doubt" could not be fully put back in the bottle, despite improvements. Thus, ensuring transparency, responsiveness, and public engagement is vital to the governance of common resources. Simultaneously, the innovations that emerged (especially service-based approaches) show that the private sector can complement public efforts when well aligned. A collaborative approach where governments set high standards and encourage innovation, and companies compete to meet those standards while educating consumers, could yield the best outcomes for sustainability. For instance, public policy could incentivize water purifier firms to develop low-energy, recyclable filter technologies, combining the trust solution with environmental stewardship.

In conclusion, the Korean case of drinking water markets illustrates a broader principle: sustainable consumption is not only a technological or economic challenge but also a social and cognitive transformation. By attending to how meanings form and evolve, and by involving stakeholders in shaping those meanings toward the collective good, we can better navigate the path to sustainability. The co-evolution of product meaning and behavior in these markets not only addressed an immediate public health concern but also set the stage for ongoing improvements and conversations about water security, illustrating the dynamic interplay between society, technology, and the environment. Future policies and business strategies in sustainability domains would do well to heed the lesson that winning hearts and minds is half the battle in achieving sustainability.

Author Contributions: Conceptualization, D.H.K. and S.L.; Methodology, D.H.K. and S.L.; Validation, J.-E.P. and S.L.; Formal analysis, D.H.K. and S.L.; Writing—original draft, D.H.K., J.-E.P. and S.L.; Writing—review & editing, J.-E.P. and S.L.; Supervision, S.L.; Funding acquisition, S.L. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available on request from the corresponding author due to confidentiality and privacy restrictions associated with qualitative human-subject research.

Conflicts of Interest: The authors declare no conflict of interest.

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