

# DISCURSIVE CONSTRUCTION OF CHINA'S NEW QUALITY AGRICULTURAL PRODUCTIVITY IN INTERNATIONAL NARRATIVES: A STUDY BASED ON LDA TOPIC MODELING AND CRITICAL DISCOURSE ANALYSIS

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**Abstract:** This study investigates the discursive construction of New Quality Agricultural Productivity (NQAP) in China's international communication, employing a hybrid methodological framework that integrates Latent Dirichlet Allocation (LDA) topic modeling with Critical Discourse Analysis (CDA). Through an analysis of coverage from *China Daily* and *Global Times*, the research explores how Chinese media utilize strategic narratives to project a modernized agricultural identity. The findings reveal seven core topics, which are further synthesized into three overarching dimensions: (1) Global Governance and Multilateral Synergies, (2) Technological Paradigms and Digital Rural Transformation, and (3) Material Foundations and Value Chain Optimization. The analysis indicates that China's agricultural narrative has undergone a significant paradigm shift toward systemic technological reconfiguration, transforming abstract policy into a perceptible modern landscape through tangible communicative carriers such as drones, agricultural robots, and high-yield seeds. This discourse recontextualizes China's international identity as a constructive contributor to global agricultural governance, offering complementary perspectives on modernization rooted in inclusive growth and material security. Ultimately, this study contributes to understanding the dynamic and constructed nature of national technological identities in cross-cultural settings and provides insights into how strategic communication facilitates the diversification of global governance paradigms.

**Keywords:** New quality agricultural productivity; Critical discourse analysis; LDA topic modeling; Agricultural modernization

## 1 INTRODUCTION

In the arena of transnational strategic competition, agricultural technological discourse has emerged as a focal point in the struggle for paradigm leadership. In 2025, the official incorporation of New Quality Agricultural Productivity (NQAP) into *China's No. 1 Central Document* (the nation's highest-ranking annual policy document focused on rural and agricultural development) signaled the elevation of this concept from an academic construct to a national strategy. This shift not only drives a revolution in domestic total factor productivity but also reconstructs the narrative of agricultural modernization within a global context.

While previous studies have predominantly focused on the political-economic interpretations of NQAP, its symbolic deconstruction within international communication remains underexplored. By integrating Latent Dirichlet Allocation (LDA) topic modeling with Critical Discourse Analysis (CDA), this study adopts a multi-dimensional approach to deconstruct China's NQAP discourse, starting with word frequency visualization to identify discursive features, moving to topic clustering for semantic mining, and ultimately unveiling how strategic narratives recontextualize agricultural modernity, contributing to a more diversified and balanced global governance landscape. To elucidate the discursive construction of NQAP, this study addresses three interrelated research questions. Ultimately, the study seeks to provide an interpretive framework for establishing an international agricultural discourse system.

## 2 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

### 2.1 Research on NQAP: From Theoretical Paradigm to Global Narrative

Current Chinese scholarship on NQAP has extended from theoretical conceptualization to strategic implementation. The theoretical lineage and fundamental core of this paradigm have been systematically elucidated in recent literature [1-2]. And Luo further analyzes the revolutionary significance of technological innovation from a historical perspective [3], leading to the construction of a comprehensive strategic framework for NQAP. At the micro-mechanism level, Huang and Li utilize grounded theory to encode qualitative data from 11 intelligent agriculture enterprises, constructing a path model of how disruptive technological innovation shapes NQAP [4]. Their work provides micro-level evidence

for understanding the process by which technological logic is translated into a fundamental reconfiguration of productivity.

Recent studies have further refined the empowerment mechanisms and effect evaluations of smart agriculture on NQAP. Through the scale measurement of smart agriculture in China, research has found that technological applications serve as a pivotal force driving high-quality and high-efficiency agricultural development [5]. Furthermore, related research indicates that NQAP is solidifying the foundation of food security and enhancing agricultural competitiveness through technological innovation and factor upgrading [6]. This process reflects the fundamental change driven by disruptive innovation in the agricultural development paradigm.

In the global discursive context, NQAP converges with cutting-edge concepts such as smart and intelligent agriculture. Related studies emphasize the application of data analytics and decision-support systems in agricultural production, positioning these innovations as strategic responses to climate change, resource constraints, and escalating global food demands. Klerkx et al. highlight the technical value of these advancements in optimizing resource efficiency [7]. However, such technical optimism is increasingly challenged by critical scholars who argue that digital tools are not socially neutral but are embedded with specific political and economic agendas. Bronson explicitly states “there is an indication that innovations in big data and machine intelligence, just as with genetically engineered seed systems, may enable by their very design consolidation of power among agribusinesses” [8]. This technological logic often leads to smart agriculture being constructed as an exclusive modernization pathway, creating a “blind spot: the needs and concerns of smaller- and medium-sized labor-intensive farms” [8]. These discursive tensions underscore a broader contestation between divergent development paradigms.

Lajoie-O'Malley et al. employ qualitative text analysis to examine policy documents on digital agriculture from international organizations such as the World Bank, FAO, and OECD [9]. Their findings reveal a high degree of consistency across these organizations' discourse, which collectively constructs a vision for future food systems centered on technological determinism and the prioritization of maximizing food production. However, this narrative is often constrained by a logic of technical efficiency that prioritizes yield, leading to a focus on productivity at the cost of the human and ecological dimensions of agricultural systems. In fact, the discursive framework of agricultural policy is in a constant state of evolution and conflict. Erjavec and Erjavec highlight the complexity of discursive competition by introducing the “discourse of multifunctionality” [10]. This paradigm posits that agriculture extends beyond mere food production; it serves as a catalyst for maintaining rural landscapes, safeguarding biodiversity, generating employment, and sustaining the socio-economic vitality of rural communities.

Overall, while existing research has touched upon the connection between power and value within agricultural technological narratives, systematic studies examining the international narratives of China's NQAP from a discourse analysis perspective remain to be explored. To deconstruct how Chinese media frame a unique global governance paradigm, this study integrates LDA topic modeling with Critical Discourse Analysis.

## 2.2 Three-dimensional Model of Critical Discourse Analysis

CDA not only examines representations of the real world but also explores how discourse shapes, and is in turn shaped by social relations. Within this theoretical framework, discourse is conceptualized not as a passive reflection of reality, but as an active construction of social meaning. As Fairclough argues, discourse functions as a form of social practice that actively constitutes social identities and relational dynamics [11], and van Dijk further positions media discourse as the primary site for examining such discursive dynamics [12]. As an arena for articulating public issues, mediating power relations and constructing social identities, media discourse has thus fostered diverse and well-developed theoretical approaches to such inquiries. Grounded in Fairclough's three-dimensional framework of discourse analysis [11], this study further incorporates LDA topic modeling as a complementary quantitative research instrument.

The textual dimension focuses on the extraction of linguistic features. By employing the LDA topic model to process media discourse related to China's NQAP, this study utilizes algorithmic clustering of high-frequency keywords to map core topics. LDA overcomes the constraints of manual analysis, providing a data-driven foundation for subsequent interpretation. The discursive practice dimension focuses on the generation of narrative strategies, attending to the processes of discourse production and dissemination. Building upon the LDA-identified topics, the study further analyzes how Chinese international media adapt and recontextualize these topics and themes into strategic narratives. The social practice dimension examines the broader impact of these discursive practices, illuminating how the NQAP narrative constructs China's international roles and advances an alternative paradigm for diversified global governance.

## 3 RESEARCH DESIGN, METHODOLOGY AND RESEARCH QUESTIONS

### 3.1 Data Collection

This study selects English-language media in China, specifically *China Daily* and *Global Times*, as the primary data sources. Within the global agricultural landscape, smart agriculture is not merely a manifestation of NQAP; it has evolved into a universal discourse within agricultural governance. To ensure thematic specificity and filter out irrelevant reports, search queries were restricted to “smart agriculture”, “smart farming” and “intelligent agriculture”. The timeframe of this study spans from September 2023, when the concept of New Quality Productive Forces was initially proposed, to October 2025, marking the completion of data collection. Following data cleaning, deduplication,



## 4 RESULTS AND DISCUSSION

### 4.1 Mapping the Semantic Field: LDA-Based Lexical Salience in NQAP Discourse

In this section, the discursive features of NQAP are examined through word cloud visualization. A comprehensive word cloud was generated based on the coverage of NQAP by the two major media outlets (see Figure 1), providing a visual representation of the core semantic nodes and high-frequency signifiers in the dataset.

This visualization transcends conventional frequency-based word clouds by deeply integrating the core probability matrices generated by the LDA model: the Topic-Word Distribution ( $\beta$ ) and the Document-Topic Distribution ( $\theta$ ). The generative logic of this semantic mapping is structured as follows.

To reduce the interference of semantically hollow high-frequency terms (e.g., said), the model leverages the Dirichlet Prior to perform semantic purification. Unlike other word clouds, this approach isolates the top 30 feature words with the highest probabilistic contribution from each of the  $K=7$  trained topics. This ensures that the visualization reflects the Latent Semantic Structure rather than superficial lexical noise.

The visual prominence of each term is predicated on its marginal probability or its conditional weight within a specific topic, rather than raw absolute frequency. This weighting logic allows terms with high discriminative power to appear prominent even if their total occurrence is low. Consequently, the word cloud accurately captures the discursive core of NQAP by highlighting terms that are topically significant rather than merely frequent.

The layout simulates a semantic field by organizing terms into hierarchical layers based on LDA weights. Using clustering algorithms, terms with strong semantic associations or high co-occurrence frequencies (e.g., smart and agriculture) are positioned in spatial proximity. This spatial arrangement reveals the intrinsic mapping between micro-level keywords and the macro-level thematic landscape, providing an intuitive deconstruction of the NQAP narrative.

In terms of narrative lexicon, terms such as “high” (representing high-quality/high-yield), “innovation”, “growth” and “quality” appear with exceptionally high frequency. This indicates that the media tend to emphasize the improvement of quality, efficiency, and the transition of kinetic energy in Chinese agriculture, thereby constructing a positive macro-narrative of China’s agricultural modernization.

The distribution of high-frequency feature words within the NQAP semantic field does more than reflect media focus; it reveals the strategic mapping through which Chinese media translate abstract policy into globally resonant narratives. Thematic terms such as “digital”, “smart”, “agriculture” and “industry” occupy central positions. This demonstrates the high priority media place on “digital technology empowering agriculture”. Specifically, through the labeled term “smart”, the media showcase to a global audience how China utilizes frontier technologies, such as big data and artificial intelligence, to drive the upgrading of traditional industries, achieving a structural leap from manual labor to intelligent production.

Keywords like “Chinese”, “farmer”, “rural” and “village” highlight the practical dimension of the reports. By narrating specific changes at the rural level, the media demonstrate how NQAP benefits ordinary households, emphasizing the efficacy of policy execution at the micro-level and strengthening the authenticity and persuasiveness of China’s rural revitalization stories.

Furthermore, significant attention is paid to the underlying logic of NQAP. The frequent appearance of “seed”, “grain” and “security” reflects that Chinese media consistently align with the global issue of “food security”, positioning seed industry innovation as the core driver of NQAP. Meanwhile, specific equipment terms such as “drone”, “robot” and “power” provide concrete communicative carriers for the abstract concept of new quality productive forces. However, to ensure an accurate interpretation of these computational results, it is necessary to clarify the specific linguistic context of certain term. The high-frequency term “power” primarily denotes electrical energy and mechanical drive. It corresponds to technical descriptions of unmanned harvesters, intelligent electrical equipment and power supply systems that constitute the physical infrastructure of smart farming. This term represents the transition from manual labor to automated energy systems rather than signifying political or discursive authority.

Notably, terms like “global”, “cooperation” and “international” frequently co-occur with “Chinese”. This illustrates that the two media outlets not only ground their international reporting in domestic achievements but also actively construct a discourse system of “Chinese wisdom serving the world”. Through technical “cooperation” and “trade” exchanges, they demonstrate China’s contribution and responsibility in addressing global food security challenges.

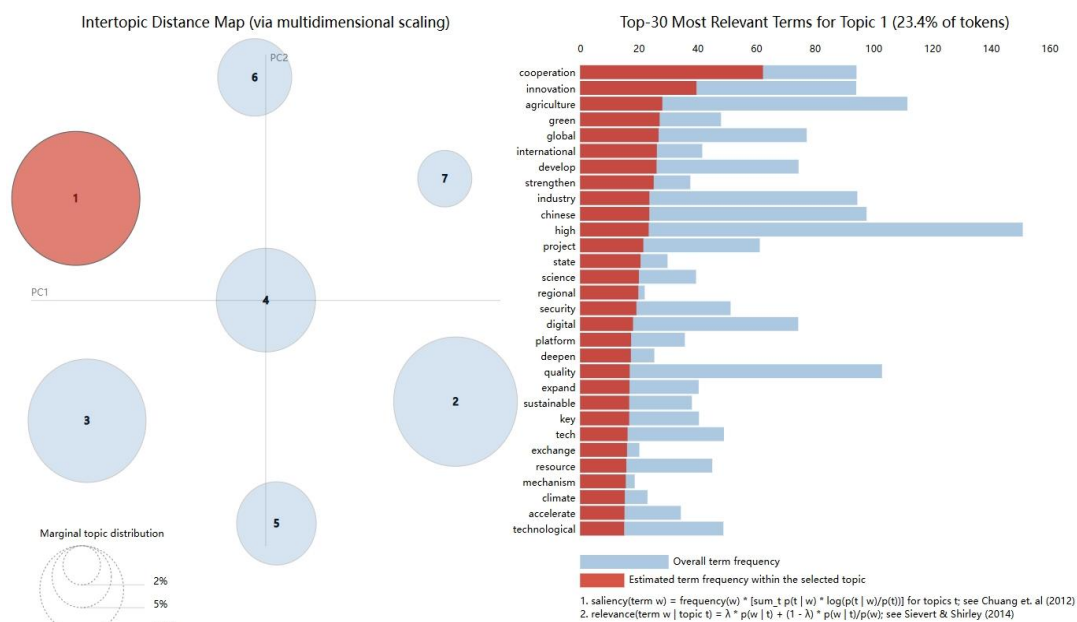
In summary, the lexical salience revealed through the LDA-weighted word cloud suggests a multi-layered discursive strategy. By intertwining high-tech signifiers with grassroots narratives and global shared concerns, the media effectively transform NQAP from a localized policy concept into a multifaceted global vision. This lexical mapping provides the foundational data for the subsequent topic modeling analysis, which will further delineate how these individual keywords cluster into distinct, structurally organized thematic domains.

### 4.2 Topic Clustering and Discursive Mapping: Semantic Mining Based on LDA

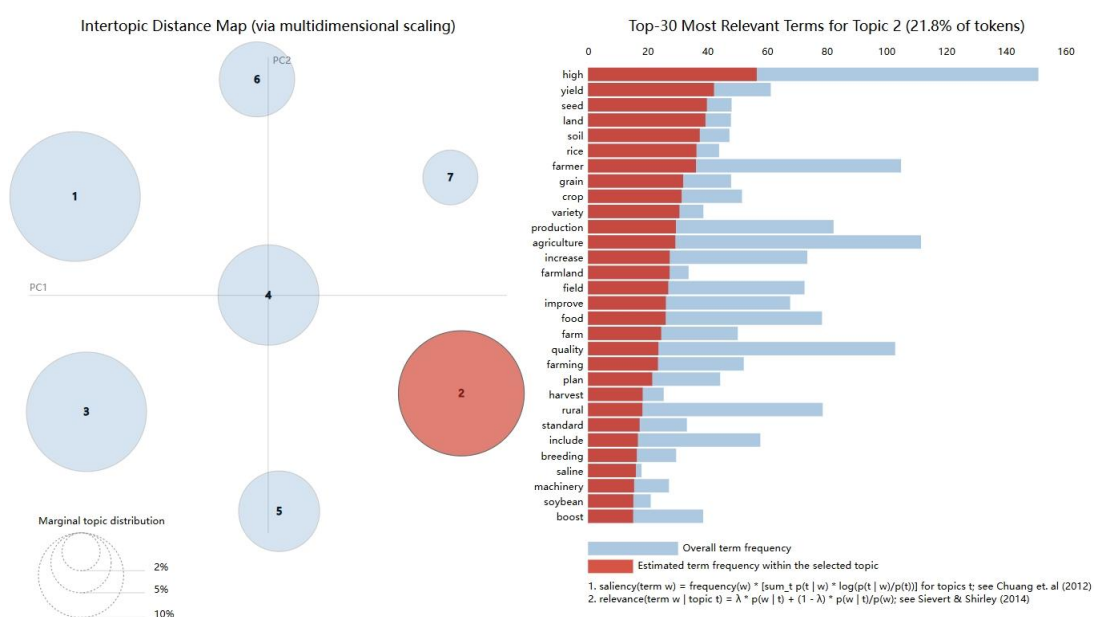
Through LDA topic modeling, this study identified seven topics (Topics 1-7), which were further synthesized into three overarching discursive dimensions (see Table 1): (1) Global Governance and Multilateral Synergies (27.6%), (2) Technological Paradigms and Digital Rural Transformation (30.8%), and (3) Material Foundations and Value Chain Optimization (41.6%). Together, these dimensions constitute the discursive landscape of the current transition toward

agricultural modernization. Figures 2 and 3 illustrate the intertopic distance maps, highlighting the clustering and relative saliency of Topic 1 and Topic 2 respectively. Due to space constraints, Table 1 presents only the top 10 keywords for each topic.

The first discursive dimension, Global Governance and Multilateral Synergies, encompasses Topic 1 and Topic 7. This dimension serves as the major site for discursive legitimation, where agricultural modernization is recontextualized as a universal contribution to global sustainability and multilateralism. The high-frequency terms in Topic 1, such as “global”, “international”, “sustainable” and “climate” (see Figure 2), indicate that in media narratives, NQAP-driven agricultural modernization has transcended national borders, being framed as a vehicle for global climate governance and multilateral cooperation. This discourse emphasizes shared responsibilities and collective action, using “mechanisms” and “platforms” (see Figure 2) to project an open-ended narrative aimed at institutionalizing green development norms globally. In contrast, Topic 7 focuses on the material underpinnings of this strategy through keywords like “tariff”, “breeding” and “trade”. These terms reveal a pragmatic risk-management dimension; against the backdrop of international trade volatility, the discourse reflects a commitment to securing seed sovereignty. By framing breeding as the chips of agriculture, the narrative elevates seed industry innovation to the level of national strategic security. This discursive construction positions NQAP not merely as a technical upgrade, but as a critical safeguard for food autonomy.



**Figure 2** Intertopic Distance Map for the NQAP by the LDA Model (Highlighting Topic 1 and its Key Terms)



**Figure 3** Intertopic Distance Map for the NQAP by the LDA Model (Highlighting Topic 2 and its Key Terms)



The second dimension, Technological Paradigms and Digital Rural Transformation, comprises Topic 4, 5 and 6. The logic of this dimension progresses from infrastructural prerequisites to global dissemination and, ultimately, spatial reimagination. “Smart” in Topic 4 and 6, “digital” in Topic 5, “intelligent” and “robot” in Topic 6 serve as the semiotic markers, projecting an agricultural future driven by algorithms, data, and automated equipment. The prominence of “power” and other top 30 keywords in Topic 4 such as “electricity” and “grid” highlights the material infrastructure required for NQAP, as the digital transformation of productive forces is highly dependent on energy networks. The co-occurrence of “African” with “drone” in Topic 5 illustrates the narrative trajectory of Chinese agricultural technology via the Belt and Road Initiative. This reflects a discursive reconfiguration of South-South cooperation, where high-tech tools act as a tangible bridge, transforming technological aid into a shared journey toward collaborative modernization. In Topic 6, the emergence of the New Farmer signals a shift from subsistence-oriented agriculture to discursive entrepreneurship. New Farmers are urban-to-rural returnees, who focus on value chains. They aren’t just planting; they are designing the packaging, hosting the livestream and so on. Consequently, the village is no longer a geographical isolate but a digitally-mediated node within a global network. Platforms such as social media transform the physical landscape into a consumable scenery, where technology does not merely optimize farming but redefines the village as a site of experience and innovation. By operating as organized entities that leverage data, logistics, and e-commerce, these villages bridge the gap between local land and global markets. This convergence represents a profound discursive reimagination. It is not merely a structural change in rural productivity, but a radical shift in what the village signifies within the global context.

**Table 1** Discursive Dimensions and Topic Distribution of NQAP based on LDA Modeling

Dimension	Topic	Topic Title	Discourse Weight	Top-10 Keywords for Each Topic
I. Global Governance & Multilateral Synergies (27.6%)	Topic 1	International Agricultural Cooperation and Green Sustainable Development	23.4%	cooperation, innovation, agriculture, green, global, international, develop, strengthen, industry, chinese
	Topic 7	Global Breeding Trade and Tariff-Driven Mechanisms	4.2%	cooperation, breeding, chinese, trade, global, digital, develop, power, tariff, crop
	Topic 4	Facility Agriculture and Smart Power Infrastructure	14%	power, food, greenhouse, agriculture, smart, project, team, global, provide, equipment
II. Technological Paradigms & Digital Transformation (30.8%)	Topic 5	China-Africa Digital Agriculture Cooperation and Plant Protection Technology	9%	drone, farmer, digital, industry, rural, chinese, african, agriculture, farm, delivery
	Topic 6	Rural Vitalization and Smart Service Robots	7.8%	farmer, rural, product, high, quality, intelligent, dream, farming, robot, smart
	Topic 2	Seed Industry Innovation and High-Yield Farmland Protection	21.8%	high, yield, seed, land, soil, rice, farmer, grain, crop, variety
III. Material Foundations & Value Chain Optimization (41.6%)	Topic 3	Agricultural New Quality Productive Forces and Value Chain Upgrading	19.8%	quality, high, cotton, industry, force, productive, growth, chinese, sector, innovation

The third dimension, Material Foundations and Value Chain Optimization, involves Topic 2 and Topic 3. It encapsulates the materialist core of the NQAP discourse, focusing on the fundamental pillars of sovereignty: land, seeds, and output. Topic 2 constitutes a discourse of existential security, where terms such as “yield”, “seed”, “rice” and “saline” (see Figure 3) serve as material anchors for national food sovereignty. The emphasis on saline-alkali land reclamation and salt-tolerant varieties transcends mere technical reporting; it reflects a discursive legitimization of China’s strategic resolve to push the biological frontiers of production. Topic 3 pertains to a paradigm-shift narrative, where the convergence of productive forces and innovation signals a transition from labor-intensive traditionalism to innovation-led systemic efficiency. By recontextualizing bulk commodities like “cotton”, under a framework of chain-based governance, the discourse industrializes the agricultural imaginary, rebranding traditional farming as a standardized, high-tech component of the modern global industrial system.

#### 4.3 Recontextualizing Modernity: Narrative Strategies and Identity Projection

Synthesized from seven core topics, three discursive dimensions present the international landscape of China’s agricultural modernization while uncovering a fundamental shift in media narrative logic under the NQAP framework. This evolution transcends mere technical description; by recontextualizing technology, identity, and global responsibility, it facilitates a leap from a production-centered narrative to one of global governance. The following

analysis explores this transformation across three aspects, including the discursive displacement of production factors, the reconstruction of international identity, and the symbolic instantiation.

Historically, the core of agricultural discourse has centered on “land”. However, the LDA results reveal that intangible technological elements have been discursively elevated as decisive variables. In *China Daily*, this displacement is manifested through sharp quantitative contrast. Reports on the Shuimu Vegetable Factory highlight that the facility “is the first agricultural complex in the country to possess national independent intellectual property rights”, noting that “in contrast to traditional agricultural bases, the digital vegetable factory requires only 10 staffers” to manage nearly 2.67 hectares [16]. This narrative shift marks a definitive transition from resource-dependency to innovation-driven development, where algorithmic precision effectively supplants empirical farming.

The high-frequency co-occurrence of “Chinese” with “global” reflects a reconstruction of China’s discursive agency. NQAP is articulated as a powerful engine for high-quality development, placing Chinese policy within the framework of global food security. By adopting internationalized terminology, the media constructs NQAP as a Chinese solution to universal challenges. This strategy aims to ensure “China’s new quality agricultural productive forces to be fully developed” [17], transforming China’s identity from a mere participant into an active provider of systemic governance models.

In media discourse, NQAP is given concrete representation through symbolic instantiation. The abstract concept is rendered perceptible through specific high-tech scenarios. For instance, reports on “unmanned harvesters” in Guangdong describe how farms integrate internet of things (IoT) systems, Beidou navigation, artificial intelligence and other technologies to facilitate fully unmanned operations across the entire rice farming process [18]. This instantiation further incorporates people-oriented dimensions to enhance technical legitimacy. The story of Gen Z farmers features Wang, a skilled drone pilot for whom “the advent of drone technology has brought about a revolutionary change” [19]. The report provides an efficiency metric: “a drone can spread two tonnes of fertilizer in just over a day, while the same amount of work used to take three people four to five days to complete” [19]. Through portrayals of drones, seeders, and balers, the media endows the chips of agriculture with a perceptible modern identity, bridging the gap between policy and international audience perception.

## 5 CONCLUSIONS AND LIMITATIONS

### 5.1 Conclusions

Based on the analysis of word clouds, seven core topics, and three discursive dimensions, this study draws the following conclusions.

First, the study identifies a fundamental paradigm shift in the underlying logic of China’s agricultural narrative. The prominence of innovation aligns strategically with Dimension 3, signaling that the narrative has transcended the traditional reliance on land and labor. By framing high technology as the strategic engine of NQAP, the media has reconfigured agriculture from a primary sector into a sophisticated high-tech cluster. This discursive transition does more than bypass the constraints of resource scarcity; it constructs a new technical legitimacy that underpins the global credibility of China’s modernization paradigm.

Second, NQAP has achieved cross-cultural bridging from abstract policy to tangible reality through technical discourse. Dimension 2 utilizes symbols such as drones and robots to provide a solid material substratum for the qualitative leap in productivity. This strategy recontextualizes policy goals into perceptible narratives, neutralizing ideological resistance and enhancing cross-cultural resonance. Consequently, NQAP has evolved from a political term into a discursive vehicle endowed with international persuasiveness.

Finally, Dimension 1 witnesses a reconstruction of China’s discursive agency within the global agricultural system. By framing Chinese wisdom as a collaborative contribution to global development, the narrative reframes China’s role from a technological follower to a proactive co-builder. This discursive transition reflects an effort to contribute to the shared interpretative frameworks of global agricultural governance, emphasizing collaborative progress rather than unilateral dominance.

### 5.2 Limitations and Future Research

This study has several limitations. First, the data is primarily sourced from English-language media outlets in China, which may overlook the discursive diversity. Future research should incorporate multilingual corpora to facilitate a more comprehensive cross-cultural analysis. Second, while this study focuses on the encoding of media discourse, it has yet to empirically measure audience decoding and feedback. Subsequent studies could employ sentiment analysis on social media platforms to evaluate the perceived legitimacy of China’s narratives within the international community.

## COMPETING INTERESTS

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