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Sustainability Trade-Offs in Media Coverage of Poverty Alleviation: A Content-Based Spatiotemporal Analysis in China's Provinces

Yuting Sun [1,*] and Shu-Nung Yao [2,*]

[1] School of Public Administration, Hohai University, Nanjing 210098, China
[2] Department of Electrical Engineering, National Taipei University, New Taipei 23741, Taiwan
* Correspondence: 20220019@hhu.edu.cn (Y.S.); snyao@gm.ntpu.edu.tw (S.-N.Y.)

Abstract: Poverty alleviation has always been fundamental for China to achieve the goal of creating a moderately prosperous society. This study conducted a content-based spatiotemporal analysis of media coverage, regression analysis of panel data, and text mining to examine how China's Targeted Poverty Alleviation (TPA) Strategy is characterised by online mainstream media platform. A total of 10,857 articles related to TPA in 31 specific provinces of mainland China were collected and analysed by Natural Language Processing (NLP) analysis. The results of this study indicated that spatiotemporal distribution of TPA coverage was consistent with the typical logic of the Chinese government in policy implementation based on spatial and social marginalisation. Media attention on TPA is influenced by economic, environmental, and community sustainability indicators, reflecting the sustainability trade-offs in TPA-related media coverage. The keywords embedded in media coverage indicated that agricultural product promotion in extremely impoverished areas and the experiences of economically developed agricultural areas were essential for poverty eradication. Keywords emphasise top-down administrative-led poverty governance for extremely impoverished areas and local autonomy for relatively impoverished areas. This study provides perspectives for antipoverty governance and media empowerment in the postpoverty era in China.

Keywords: content-based analysis; media coverage; spatiotemporal distribution; sustainability trade-offs; Targeted Poverty Alleviation Strategy

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1. Introduction

Poverty may involve a lack of opportunities, empowerment, or security, malnutrition, or poor health [1]. Definitions of poverty are diverse. Traditional approach views poverty as either low utility or shortfall in primary goods, resources, or income; Capability approach proposed views poverty as the deprivation of basic capabilities from realising their full potential [2–4]. Absolute poverty describes a condition characterised by severe deprivation of basic human needs, which depends not only on income but also on access to services [5]. Relative poverty as a standard is measured in terms of the society in which an individual lives and which therefore differs between countries and over time. Marginalisation is a root cause of poverty in many cases and is synonymous with poverty [6–8]. Poverty is unevenly distributed from the spatial dimension of marginalisation. In rural areas, especially those with a poor ecological environment, a remote geographical location, and inadequate public services and facilities, diverse forms of poverty are evident [9,10]. The social dimension of marginalisation emphasises the importance of the marginalisation process for marginalised groups [11–13]. As a marginalised group, low-income individuals in disadvantaged villages face difficulties participating in various aspects of life.

Both developing and developed countries today are experiencing poverty in different forms and to varying degrees. Much of the research on poverty in developed countries tends to predominantly focus on urban poverty and relative poverty [14], while studies

on poverty in developing countries are mostly restricted to rural poverty and extreme poverty [15]. This is because the majority of the population of developing countries live in the rural areas, and they have less access to the socio-economic and infrastructural facilities than their urban counterparts [16]. Poverty governance is essentially a multi-faceted process of using political power, exercising political authority, mobilizing political resources, running political institutions, and gaining political legitimacy [17]. In developed countries, poverty reduction is regarded as a poverty governance model. Developing countries, due to potentially weak political and administrative areas of governance hardly achieved sustainable rapid growth for a long time in reducing poverty [18–20]. China has a large poor population and has contributed to most of the world poverty reduction [21]. It is essential to examine poverty governance in China due to its diversity.

Poverty reduction related to human prosperity is one goal of sustainable development [22]. Sustainable development is a balance between economic, social, and ecological goals [23]. Previous evidence shows that, over the past two centuries, economic development has resulted in a sharp decrease in absolute poverty worldwide [24]. Poverty alleviation faces trade-offs among economic, environmental, and community/social sustainability. Especially in China, due to the long-standing urban-rural dual system, rural multidimensional poverty contributed 80% of the national multidimensional poverty. Poverty mainly occurs in rural areas with a very large peasant population of rural hukou [25]. To eliminate rural poverty and realise rural revitalisation, poverty reduction must be adapted to the social and environmental conditions in different regions of China, and the social process of poverty alleviation must be adjusted to and embedded in local areas. Consequently, it is essential to address poverty alleviation trade-offs among sustainability dimensions and ensure the balanced and full development between urban and rural areas.

Poverty alleviation is a vital goal for China to create a moderately prosperous society. Since the 1980s, the Chinese government has been committed to poverty reduction [26]. In 2013, the Targeted Poverty Alleviation (TPA) Strategy was set forth by Chinese President Xi Jinping as a departure from previous poverty alleviation strategies; he sought to move from the transfusion type of poverty alleviation to haematopoietic poverty alleviation [26]. Since then, poverty alleviation measures have been applied with the aim of establishing of a long-term system for reducing poverty. After eight years of continual effort, China finally eradicated absolute poverty in 2020 [27].

Mass media is considered as a major force against poverty [28]. Some research has examined the media role influencing policymakers to set the agenda for poverty alleviation programs and the effect of the influence of media coverage of poverty alleviation programmes on the people [29]. With the development of Internet technologies and horizontal and vertical strategic advancements in the field of media integration, diversified-level mainstream news sources gathered in online media platforms. Understanding TPA-related spatial distributions and temporal trends and identifying the logic of online media related to TPA are paramount for sustainable long-term poverty eradication. Therefore, a discussion of online mainstream media coverage in this crucial stage of poverty alleviation is essential, and this discussion is expected to inspire future media coverage strategies in the postpoverty era.

Previous research employed text mining approach to examine policy documents of the poverty reduction strategy. Smith-Carrier and Lawlor [30] used corpus linguistics and critical discourse analysis to study a poverty reduction strategy implemented in Ontario, Canada. Some researchers examined specific TPA programs of China such as projects on power generation [31–33] from policy documents and e-commerce poverty alleviation from social media platform [34]. These studies mainly focused on policy texts and few studies have adopted text mining to examine how China's TPA Strategy is characterised by online media. Furthermore, when considering the amount of media coverage and meaning of media content as assessments of media attention, few studies have focused on sustainability trade-offs of media attention on TPA and how China's TPA Strategy is being characterised by the media.

Based on above research gaps, in this study, content analysis was initially applied to investigate the spatial and temporal distribution of TPA-related coverage. Then, according to economic, environmental, and social sustainability, a panel data econometrics regression model with the above three dimensions of sustainability and sum of TPA-related coverage on mainland China's provinces from 2017 to 2020 was established to explore the sustainability trade-offs in TPA-related media attention. Finally, a text mining approach was employed to explore keywords in the media coverage, and the mechanism through which TPA is represented by the media. The research questions investigated in this study are described as follows: (1) What dynamic patterns of temporal and spatial distributions are represented in TPA-related coverage? (2) What indicators of sustainability dimensions affect TPA-related coverage? (3) How are dynamic patterns of temporal and spatial distributions of keywords embedded in media storytelling related to TPA? The results of this study can contribute to a deeper understanding of antipoverty governance in rural China through media empowerment.

2. Literature Review

2.1. Marginality and Poverty

Marginality is primarily defined and described using two major conceptual frameworks, namely spatial and societal dimensions [35]. The spatial dimension of marginality is primarily based on physical location and distance from centres of development; such locations lie at the edge of or are poorly integrated into a system [36,37]. This concept is used to gain insights into the influence of physical locations and distance on the livelihoods of individuals and groups. The societal dimension focuses on understanding the underlying causes of exclusion, inequality, social injustice, and the spatial segregation of people by demography, religion, culture, social structure, economics, and politics. Such factors are related to access to resources by individuals and groups [36–42].

The concept of marginality, which is multidimensional and multidisciplinary, generally integrates geographical or physical locations with sociocultural, political, and economic spheres where disadvantaged people struggle to gain access (societal and spatial) to resources and fully participate in social life [35,37,43]. Marginality is a social construct, and social and political forces are regarded as the core determinants of marginality [44]. Marginalisation is a social structure and the result of conscious actions by social actors. When marginalisation becomes a part of rules, it constitutes the condition and medium of individual actions in social structures [45].

Marginalisation is a root cause of poverty in many cases and is synonymous with poverty [6–8]. The main reasons for such difficulties lie in the internal cohesion and local mechanism of marginalised areas. Villagers may reject outsiders and lack trust in foreign poverty alleviation personnel and technology. Moreover, villages lack effective integration mechanisms for different stakeholders. The aforementioned phenomena affect the development and effects of poverty alleviation governance in villages.

Demarginalisation is a process with low and high marginality on two ends of a continuum [46]. Although the development of technical tools helps people in spatially marginalised areas to improve their lives gradually, social difficulties persist [47]. Demarginalisation efforts must be adapted to the environmental and social conditions of different regions, and the social process embedded in local areas must be accordingly adjusted. Poverty alleviation is a poverty governance model in developed countries. Some countries (e.g., Turkey, German, Greece, etc.) established extensive participation and negotiation mechanisms with stakeholders [21]. Japan paid attention to youth education and participation in sustainable development knowledge, as well as promoting increased awareness of, commitment to, and ownership of the agenda [22,48]. Good governance associated with the buzzwords of "participation" and "empowerment" provides a sense of purpose and hope for equality of opportunity in the fast-moving world of development policy [49]. As a consequence, a sustainable poverty alleviation strategy focuses on im-

proving the lives of the poor and vulnerable through strengthening the social dimension of demarginalisation [50].

2.2. News Media's Role in Poverty Alleviation and Discussing Poverty-Related News

News media are regarded as crucial components in the fight against poverty. They call to action with strong involvement from civil society to policies and programmes, thus setting national agendas and ultimately motivating the implementation of policy-making processes [51]. Therefore, policy debates through media can help democratise policies and increase awareness of poverty alleviation policies, ultimately strengthening the advocacy and demand for improved poverty alleviation programmes. Reports on TPA reports are vital for the promotion of TPA activities. Thus, how media portray the fight against poverty has a considerable effect on the public's and policymakers' expectations of poverty alleviation processes and eventually determines whether and to what extent stakeholders and social actors participate in poverty alleviation.

In an English-language context, previous studies [52–55] centred on news framing of poverty coverage in mass media. This type of coverage mostly focuses on the "consumption of the poor suffering" from the perspective of "the other" [52] rather than on the plight of low-income individuals [53]. Poverty coverage by mass media is mostly attributed at the societal level rather than the personal level; thus, the audience may form the belief that governments should take responsibility to alleviate poverty [54,55]. Although some researchers have employed content analysis to examine policy texts focusing on certain TPA projects in China, such as policy texts on photovoltaic power [32,33], few studies have focused on the media coverage of TPA. Given the importance of rural and national representations for fighting poverty in mainland China, the main aim of this study was to determine if and how online mainstream media give voice to or represent the values of rural Chinese people in discussions of poverty alleviation strategies in mainland China.

2.3. TPA policy and Regional Profiles in a Chinese Context

China's national poverty reduction programmes have experienced a three-stage evolution: from region-focused targeting (*quyu miaozhun*) during 1986–2000 to village-focused targeting (*zhengcun tuijin*) during 2001–2010 and then to household-focused targeting (*jingzhun daohu*) during 2011–2020 [25]. The TPA Strategy was on the agenda of China's 13th Five-Year Plan for Economic and Social Development [26]. Essentially, TPA involves accurately identifying low-income individuals, accurately allocating poverty alleviation funds, accurately formulating poverty alleviation measures, accurately implementing poverty alleviation strategies in appropriate areas, and accurately assessing poverty alleviation results. The aim of TPA is to alter poverty alleviation methods from being material centric to being region and household centric [56]. Furthermore, TPA policy focused on economic, environmental, and social sustainability. In 2015, ten projects of the TPA were issued including vocational education and training, helping cadres' residency in impoverished villages, microfinance, ex situ poverty alleviation relocation (ESPAR), e-commerce, tourism, photovoltaic power generation, papyrifera planting, entrepreneurship training of rich leaders, and leading enterprises driving poverty alleviation [26]. In addition, to strengthen the community-level poverty alleviation capacity, China's governments at various levels have dispatched human resources to poverty-stricken villages. These targeted poverty alleviation measures are calling for the establishment of a long-term system to better carry out efforts.

As to TPA implemented regions, in 2012, the State Council Leading Group Office of Poverty Alleviation and Development in China identified impoverished counties for poverty alleviation and development. In total, 832 counties across 22 provinces were identified as national-level impoverished counties according to the criteria of farmers' per capita net income and the size of the poor population. The aforementioned poverty-stricken areas are located in ecologically vulnerable zones with poor living conditions, frequent natural disasters, defective economic foundations, poor infrastructure, and insufficient

public services [57]. Before extreme poverty was eradicated by the end of 2020, people experiencing poverty were primarily concentrated in designated poverty-stricken areas, especially in the most impoverished areas of minority provinces, autonomous regions, and remote regions in western China, including several prefectures in Tibet, Xinjiang, Gansu, Sichuan, and Yunnan [57]. After eight years of continual effort, on 23 November 2020, China announced that it had eliminated absolute poverty nationwide by uplifting all of its citizens beyond the absolute poverty line of 2300 RMB per year (2010 constant prices) set in 2012, or less than a dollar per day poverty line [25,27]. In total, 832 impoverished counties, 128,000 impoverished villages, and 98.99 million impoverished people have been lifted out of poverty [27].

3. Research Methodology and Data

3.1. Content Analysis and Natural Language Processing

Conventional content analysis can provide an integrative perspective of a text and its related context for researchers to understand social phenomena in a subjective yet scientific manner [58,59]. Content analysis involves the thematic categorisation of words to reveal the content and context of the language used [60]. The frequency of appearance of thematically categorised words can provide an objective means of gauging the salience of certain concepts in a corpus [61]. In this study, content analysis was conducted to examine media trends as well as identify and analyse observable semantic data pertaining to TPA-related articles.

Natural language processing (NLP) involves an automatic analysis of human language and aims to address complexity and multiple connotations. In text mining, NLP is employed to understand data as though a human coder is reading the relevant text [62]. NLP enables the identification of relevant information within a text from a large corpus, which can assist researchers in making large data sets manageable and enhancing the trustworthiness of analysis results [63]. The text mining techniques used in the current study were correspondence analysis and Word2Vector analysis.

Content analysis combined with NLP may help extract meaning from data and enhance the inferences that researchers can make from a given text [63]. Currently, this method has been widely used in web data mining, search engines, geopolitical events, sentiment analysis, and social media content [64–66]. This present study combined content analysis and NLP in qualitative data analysis to provide a deeper understanding of texts.

3.2. Data Collection and Related Analysis

3.2.1. Media Attention: Poverty Alleviation Coverage

The present study's research sample was obtained from NTV (www.ntv.cn, accessed on 1 January 2021), which is a mainstream media convergence platform including state-controlled and local news sources concerned with three issues, namely agriculture, rural areas, and farmers, distinguished from social media, bloggers, or independent journalists. The term 'fupin' (poverty alleviation) was used to search for articles about poverty alleviation. The concept of TPA was proposed in 2013, and absolute poverty was eradicated in China in 2020. All included articles were published between July 2017 and December 2020. The article content and related news information were collected using the R crawling package (rvest and httr) to extract textual information [67]. Data collection involved the retrieval of 10,857 articles and related information, including article headings, URLs, publication dates, news sources, and news content. Advanced parsing techniques were used to remove redundant segments (e.g., pictures and short videos) of data that might have biased the results [68]. Furthermore, ethical issues for data mining were considered in relation to individual privacy [69]; hence, neither personal data nor behavioural data were revealed in this study.

3.2.2. Indicators of Sustainability Dimensions Affecting Media Attention

Previous studies indicated that specific indicators quantitatively assess the economic, environmental, and social sustainability [70–73]. Indicators used in economic sustainability assessments includes profitability [70], farm revenues and household income [71], crop yield [72] as well as several inputs and outputs such as farm productivity and technical efficiency [72,73]. Environmental indicators include pesticide use, greenhouse gas emissions, biodiversity, water pollution, soil quality, and land conservation [73,74]. The social dimension is associated with the broader society indicators, such as vitality of rural areas and contribution to local residents [73]. In this study, indicators were selected and constructed from related studies. In addition, researchers also took data accessibility and openness into consideration. Thus, the indicators chosen in this study were those similar or relevant with sustainability dimensions which can be found in the National Bureau of Statistics of China.

Specifically speaking, first, "agricultural gross domestic product (GDP)" represents agricultural productivity; "effective irrigated area" reflects technical efficiency; and "per capita disposable income of rural residents" represents rural household income. These three variables were employed to assess economic sustainability. Second, "pollution control investment" indicates pollution treatment and "affected area of crop" indicates disaster risk resistance capacity. These two variables were used to evaluate environmental dimension. Third, "rural doctors and medical workers" reveals the input of rural community healthcare resources; and "numbers of receiving social relief in rural areas" reveals equity and poverty alleviation efficiency of rural communities. These two variables were selected to measure social dimensions. The list of the variables for the years 2017–2020 are shown in Table 1. Then a panel data approach was selected for the analysis, and annual data for 31 provinces in mainland China were taken from the National Statistical Yearbook 2021 Indicators. For 31 provinces and 4 years, there were 124 observations, which was a suitable number to proceed with quantitative data analysis.

Table 1. Sustainability indicators used as variables in regression analysis.

Dimensions	Variables	Description	Unit
Media attention	Media coverage	Numbers of articles related to poverty alleviation	Piece
Rural economic sustainability	Agriculture GDP	Agricultural gross domestic product (GDP) as an indicator of agricultural productivity	100 million Yuan (RMB)
	Effective Irrigated Area	Technical efficiency of farmland	Thousand Hectares
	Rural Residents' Income	Per capita disposable income (PCDI) of rural residents	Yuan (RMB)
Environmental sustainability	Pollution Control Investment	Capital input of pollution treatment	10,000 Yuan (RMB)
	Affected Area of Crop	Disaster Risk resistance capacity of agriculture	Thousand Hectares
Social/Community sustainability	Rural Doctors and Medical Workers	Input of rural community healthcare resources	10,000 people
	Numbers of Receiving Social Relief in Rural Areas	Social relief stand for equity and poverty alleviation efficiency of rural community	10,000 people

3.3. Category Building of Media Coverage and Intercoder Reliability

Numerous key steps in content analysis are required to enable valid and reliable inferences to be derived from data [63]. Each coverage should be coded with a region based on which place of TPA experience it reported. Through observation before coding,

researchers found place names such as XX province, XX city, XX town and XX township, etc., mostly occurred in news title and news content. As news title and news source are short, region coding of each coverage was easier to identify. Thus, a dictionary of geographical names was firstly constructed. Furthermore, news sources were mainly named by the form of "place + newspaper/media/broadcasting . . . ", and local media always reported local TPA experience. Thus, a local media dictionary was then constructed to detect regions of news sources. Specifically speaking, in the dictionary of geographical names, 31 provincial-level administrative regions in mainland China comprised the largest geographical unit in mainland China. This unit included the geographical names of 22 provinces, 5 autonomous regions, and 4 municipalities directly under the control of the central government. The names of prefecture-level cities were provided in the second unit; district and county names were provided in the third unit; and town names were provided in the fourth and smallest unit. Village names were not included in the dictionary. In the local media dictionary, names of local media were included in the fifth and as a unit to identify the region each coverage belongs to through detecting news sources. If coverage can't be identified from news title and news source, content of coverage can be as judgment. For news content that focuses nationwide TPA experience but not related to a specific place, researchers manually classified it as nationwide/others. Finally, researchers established a table presenting the classification of regional categories. The categorisation scheme applied in this study involved manual coding and a data-driven approach (Tables 2 and 3).

Table 2. Categorisation scheme and 2019 agricultural land use in Chinese provinces.

Regions Categories		Agricultural Land in 2019	
Regions	**31 Provincial-Level Administrative Regions**	**Area (100,000 km^2)**	**Percent (%)**
Seven regions		**696.68**	**72.49%**
Southwest	Yunnan, Guizhou, Sichuan, Tibet, Chongqing	196.51	20.45%
Northwest	Shaanxi, Gansu, Ningxia, Qinghai, Xinjiang	168.02	17.48%
North	Hebei, Shanxi, Inner Mongolia, Beijing, Tianjin	120.93	12.58%
Northeast	Heilongjiang, Jilin, Liaoning	69.29	7.21%
Eastern	Shandong, Jiangsu, Shanghai, Zhejiang, Fujian, Anhui, Jiangxi	58.84	6.12%
Central	Henan, Hubei, Hunan	44.59	4.64%
South	Hainan, Guangxi, Guangdong	38.50	4.01%
Nationwide/Other regions			
Extremely impoverished areas		**633.51**	**65.91%**
Southwest	Yunnan, Guizhou, Sichuan, Tibet, Chongqing	196.51	20.45%
Northwest	Shaanxi, Gansu, Ningxia, Qinghai, Xinjiang	168.02	17.48%
North	Hebei, Shanxi, Inner Mongolia	119.20	12.40%
Northeast	Heilongjiang, Jilin	57.08	5.94%
Eastern	Anhui, Jiangxi	23.86	2.48%
Central	Henan, Hubei, Hunan	44.59	4.64%
South	Hainan, Guangxi	24.25	2.52%
Relatively impoverished areas		**63.17**	**6.57%**
North	Beijing, Tianjin	1.73	0.18%
Northeast	Liaoning	12.21	1.27%
Eastern	Shandong, Jiangsu, Shanghai, Zhejiang, Fujian	34.97	3.64%
South	Guangdong	14.26	1.48%

Note: Agricultural land includes cultivated land, orchards, forestland, pasture, and other agricultural land [75,76].

Table 3. Coding scheme: take Gansu and Jiangsu as two coding examples.

Province	Prefecture-Level City	County-Level Administrative Unit	Street/Sub-district/Town/Xiang	Community/ Village	News Sources
Gansu (Extremely impoverished)	Lanzhou, Tianshui, Baiyin, Jinchang, Jiayuguan, Wuwei, Qingyang, Pingliang, Zhangye, Jiuquan, Dingxi, Longnan, Linxia hui, Linxia Hui Autonomous Prefecture, ***Gannan Tibetan Autonomous Prefecture***	***Hezuo county level city***	Dangzhou street etc.	Zhihema community etc.	Gansu People, Gansu China, Gansu Daily, Gansu Economic Daily, Gannan Headline, Silkroad Pearl net, New Tianshui, Western Business Daily etc.
			Nawu town etc.	Duoheer village etc.	
			Kajiaman Xiang etc.	Haikeer village etc.	
		Lintan county, Zhuoni county, Diebu county, Zhouqu county, ***Xiahe county***, Maqu county, Luqu county	Lapuleng town etc.	Tawa Community etc.; Jiujia village etc.	
			Damai xiang etc.	Shantang village etc.	
Jiangsu (Relatively impoverished)	Nanjing, Suzhou, Wuxi, ***Changzhou***, Zhenjiang, Nantong, Yangzhou, Taizhou, Xuzhou, Lianyungang, Huaian, Yancheng, Suqian	***Jintan district***, Liyang county level city, etc.	Xicheng street	Hebin community etc.; Chengnan village etc.	Jiangsu China, Jiangsu Broadcasting Corporation, Nanjing Broadcasting System, Nanjing Daily, Yangtse Evening Post, Jiangnan Times, Wuxi Daily, etc.
			Jincheng town etc.	Wuxing community etc.; Nanyao village etc.	
			Hualuogeng high-tech sub-district etc.	Yaotang village etc.	

Note: As several County-level administrative units in one Prefecture-level city in each Chinese province, we take place names highlighted in bold and italics as sub-leveled examples.

News articles were coded by two doctoral students in mainland China who had sufficient understanding of China's TPA context and were familiar with content analysis approaches. Two coders were trained using a random sample of 20% of all coded articles. When different codes were applied, the two coders held discussions and selected the most suitable code. First, a reliability pretest involving Holsti's formula [77] indicated an average agreement of 0.87 among the classification of regional categories. Subsequently, Krippendorff's alpha [78] yielded an average reliability value of 0.93 among regional categories; this value is considered acceptable.

3.4. Relevant Analyses and Research Process

First, spatial distribution of media coverage as a proportion of total coverage was calculated by province units from 2017 to 2020. R packages such as Remap, baidumap, and ggplot2 facilitated data extraction and output visualisation. Second, the temporal distribution of media coverage related to different provinces was determined for each month from 2017 to 2020. Term frequency (TF) refers to how often a term appears in the corpus, and inverse document frequency (IDF) decreases the weight of commonly used words and increases the weight of words that are less commonly used in a corpus. The term frequency-inverse document frequency (TF-IDF) statistic is used to measure how important a word is to a document in a corpus [79,80].

An analysis based on TFs can determine whether a data set can capture differences in language over various years. Such an analysis involves determining which words are more or less likely to be used during a certain period by using the log odds ratio; then, the results are assessed as a descriptive base. The number of times each word is used over 2 years is counted, and the log odds ratio for each word is then calculated [80,81]. The formula for the log odds ratio is as follows:

$$\text{Log odds ratio} = \ln\left(\frac{\left[\frac{n+1}{total+1}\right]\text{pre year}}{\left[\frac{n+1}{total+1}\right]\text{later year}}\right) \quad (1)$$

where n is the number of times that a given word is used in each period, and total indicates the total number of words in each period.

In terms of panel data, the analysis first formulates the generalized functional model in the sense of [82] as media coverage being a function of Agriculture GDP, effective irrigated area, rural residents' income, pollution control investment, affected area of crop, rural doctors and medical workers, and numbers of receiving social relief in rural areas. The model is stated in the following equation:

$$\begin{aligned}\text{Media coverage}_{(it)} = \text{Intercept}_{(it)} + \text{GDP}_{(it)} + \text{Effective area}_{(it)} + \text{Income}_{(it)} + \text{pollution invement}_{(it)} \\ + \text{affected area}_{(it)} + \text{healthcare resources}_{(it)} + \text{social relief}_{(it)}\end{aligned} \quad (2)$$

Two indices are included in this equation, t for the time series and i for the cross-sections. The dependent variable of this model is media coverage in logarithmic terms. Except for the variable of rural doctors and medical workers, other independent variables are included in logarithmic (log) terms to decrease multicollinearity. In order to avoid pseudo regression, the ADF–Fisher test of the panel unit root test is conducted, and results indicates that all variables were stationary, as the *p*-values were less than 0.05. Then, multicollinearity test and heteroscedasticity test are separately conducted to examine the OLS model. Regarding the multicollinearity test, all variance inflation factor (VIF) values corresponding to the independent variables are below 10, and we could conclude that the model does not have collinearity problems. Regarding the heteroscedasticity test, *p*-value is 0.31 > 0.05 in White test. Thus, the errors have equal variance across the range of the dependent variable and the OLS regression analysis is efficient.

After these preliminary considerations, the approach proposes a panel fixed effects regression (FE), a panel random effects regression (RE), and a panel pool (POOL) regression to be compared for selection. A rule of thumb for the Hausman test indicates that a *p*-value (probability) smaller than 0.05 would indicate the selection of the fixed effects regression model, whereas the opposite would indicate the selection of the random effects regression model. F-test indicates that a $p < 0.05$ would achieve the selection of the fixed effects regression model, whereas the opposite would select the pool effects regression model; BP-test indicates that $p < 0.05$ would select the fixed effects regression model, whereas the opposite would choose the pool effects regression model. In this case, the pool effects regression model should be chosen according to the results of Hausman test, F-test, and BP-test (Table 4).

Table 4. Related tests for panel data regression analysis.

Test	Purpose	Value	Result
Hausman test	FE vs. RE	$\chi^2(7) = 17.073$, $p = 0.017$	FE
F-test	FE vs. POOL	$F(30,86) = 1.302$, $p = 0.173$	POOL
Breusch-Pagan test (BP-test)	RE vs. POOL	$\chi^2(1) = 0.640$, $p = 0.212$	POOL

3.5. Data Processing

Several text mining techniques were used to ensure the accuracy of the analysis results. First, the Jieba system was used [83] for the segmentation of Chinese words and sentences in all articles. Second, a simplified Chinese stop words corpus was imported. This corpus excluded high-frequency numbers and letters used in texts in such a manner that would prevent the meaningful interpretation of results. Third, compound words and specific expressions were detected and combined. Fourth, alternative spellings were accounted for, and names with two and more words were combined into one word so that they would not be counted separately. After the aforementioned processing steps, additional stop words such as the time expressions year and hour, directions such as under and above, and other similar terms were manually excluded according to a common interpretation of the Mandarin language [69]. After data cleaning, 6,162,276 words were used for further text analysis. Statistics analysis in this study was conducted in R [83].

4. Results and Discussion

4.1. Spatiotemporal Distribution of Media Coverage on Poverty Alleviation

Figure 1 shows the spatial distribution of media coverage on TPA as a proportion of total coverage during 2017–2020. In this figure, a darker hue represents a higher media focus on poverty alleviation. Media attention on poverty alleviation is represented by obvious spatial clusters distributed in 31 provinces and cities in China.

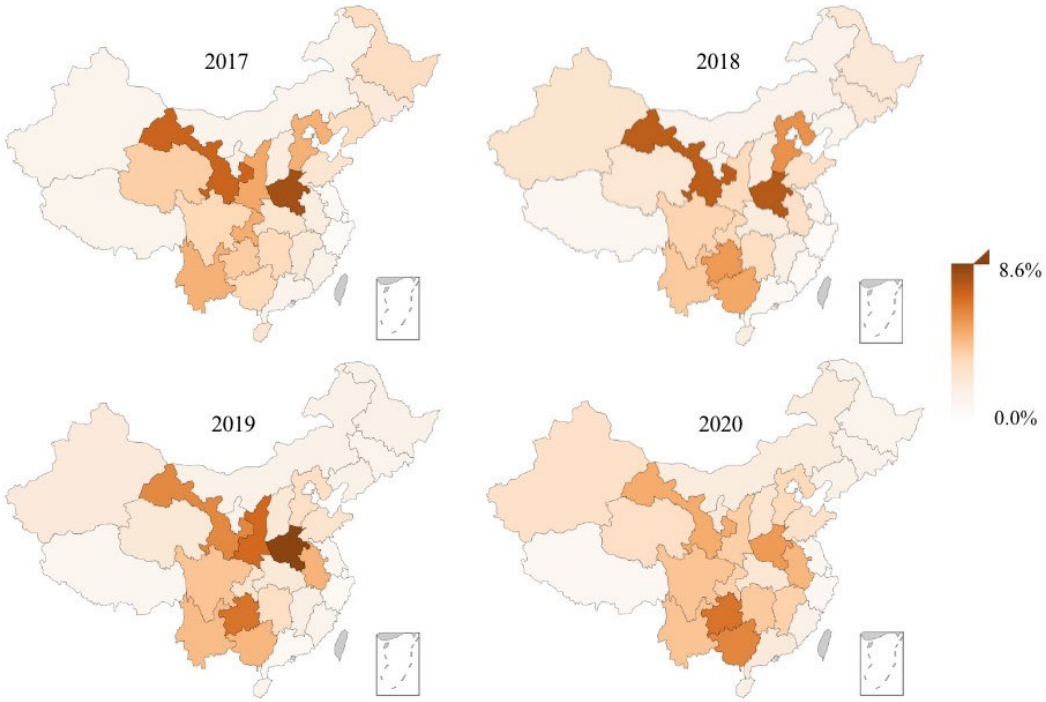

Figure 1. Spatial distribution of media coverage on TPA as a proportion of total coverage in a given year during 2017–2020.

Media attention was mainly distributed on the central, northwest, and southwest regions of China and neighbouring provinces. Substantial differences existed between eastern and western regions, and attention was higher in inland areas than in coastal areas. Studies have divided the total land area of mainland China into an eastern part and a western part by using the Hu Huanyong Line, with 96% of the population of China living in the eastern part, which covers 36% of the total land area of China [84]. Rural low-income individuals have been unevenly distributed in China over the past decade, with 16.4% of them living in northwestern regions and 83.6% of them living in southeastern regions [85,86]. This result indicated that provinces closer to or crossing the Hu Huanyong Line, such as Shaanxi, Henan, and Gansu, had high media coverage; provinces far away from the Hu Huanyong Line, such as the eastern provinces of Xinjiang and Tibet, had the lowest media coverage. This finding is consistent with mainland China's poverty distribution.

In terms of dynamic spatial patterns, media coverage of certain regions expanded yearly. Such coverage concentrated on certain provinces in 2017 and then expanded to cover most regions in China by 2020. In line with the yearly progress on poverty alleviation in China, media focus on regional poverty alleviation has undergone a marked shift from impoverished regions to the non-impoverished and those emerging out of poverty and from regional targeted coverage to widespread national coverage.

With regard to the media coverage of specific regions, Henan, which is a province located in central China, received the most coverage each year. The northwestern province Gansu and southwestern provinces such as Guangxi, Sichuan, Guizhou, and Yunnan also received substantial media attention from 2017 to 2020. Media attention on northeast

China declined from 2017 to 2020. Similarly, Shanxi and Inner Mongolia, as central impoverished provinces with 36 and 31 impoverished counties, respectively, received little attention over a long period. In eastern China, Jiangxi and Anhui, which are relatively impoverished compared with other provinces this region, attracted media attention, which increased yearly.

The results indicate that poverty is dynamic, complex, and multidimensional, and it can have different characteristics in different geographical regions. A lack of natural endowments, poor geographic conditions, and a fragile ecological environment place areas at a major competitive disadvantage [87]. These factors are the main drivers of China's persistent poverty and are reflected in media coverage on poverty alleviation.

4.2. Monthly Distribution of News Coverage of Poverty Alleviation

Figure 2 presents the monthly distribution of provinces' news coverage. In terms of temporal distribution, the second halves of the years 2017, 2018, and 2020 are represented by darker hues than are their first halves, which indicates that media attention was higher in the second halves of these years. Since 17 October 2014 has been designated as National Poverty Alleviation Day; thus, media coverage on poverty alleviation increased every October. TPA activities in the first half of the year were examined at the end of the year. Furthermore, the highest number of poverty-alleviation-related coverage was nationwide, which indicated that the trends of media coverage for TPA closely follow political affairs and important sessions of the Communist Party of China (CPC), such as the 19th National Congress in October 2017, the Third Plenary Session of the 19th Central Committee in January 2018, the Political Bureau Meeting of the CPC Central Committee in July 2018, and the two sessions held in May 2020. After the top-down policy deployment of TPA in late 2017 and 2018, each province had to transform national policy documents into concrete actions for implementation in 2019. When progress in alleviating COVID-19 outbreaks was achieved in March 2020, media attention shifted to the struggle to end poverty. The aforementioned findings indicate that the temporal trends of media coverage were in line with China's TPA mechanism.

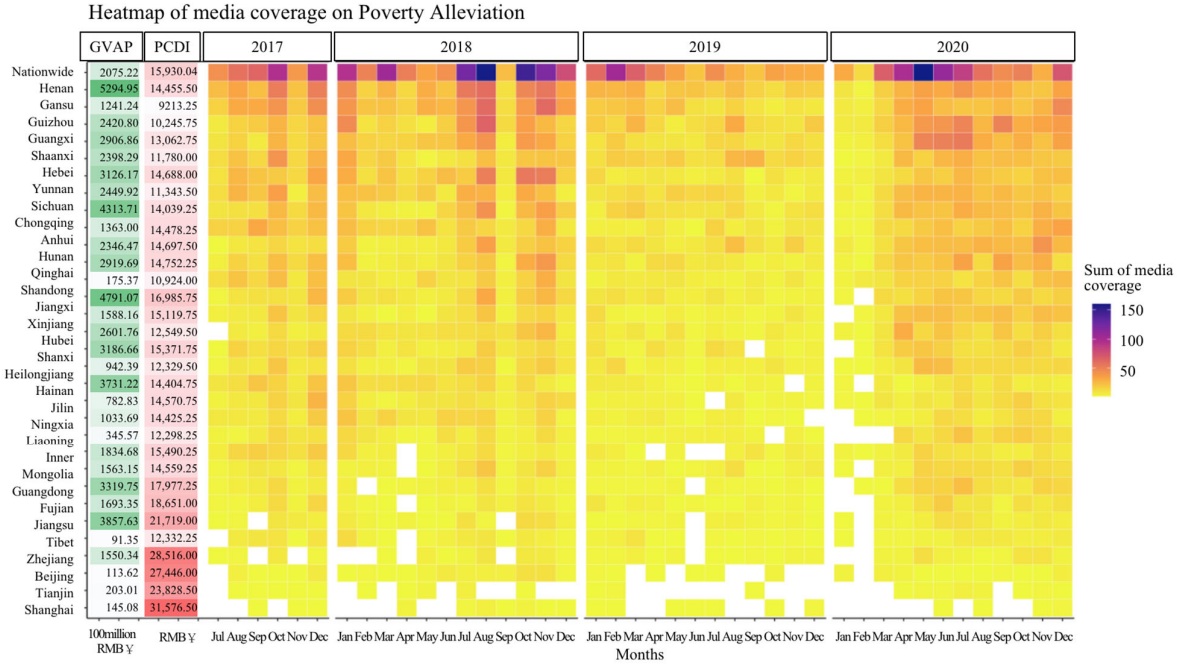

Figure 2. 2017–2020 Heatmap of the monthly distribution of TPA coverage in different provinces. Notes: AGDP is the short of "Agricultural gross domestic product (GDP)", the value of AGDP is the average value from 2017 to 2020; PCDI is the short of "Per Capita Disposable Income of Rural residents", the value of PCDI in Figure 2 is the average value from 2017 to 2020 [87].

Of all the provinces, Henan received the most media attention on TPA because Henan is located in the area of three mountains and one beach and has the largest rural population in China, which reached 45.11 million people in 2020 according to the National Bureau of Statistics of China [87]. Furthermore, agriculture is a crucial contributor to poverty reduction [88,89]. As a large agricultural province and a major source of high-quality agricultural products in China, the value that Henan adds to this primary industry is second only to that added by Shandong and Sichuan [87]. According to the average value of "Agricultural gross domestic product (AGDP)" from 2017 to 2020 in Figure 2, provinces with high agricultural GDP generally received high media attention, while the "Per Capita Disposable Income of rural residents (PCDI)" in these high agricultural GDP provinces is low. As agricultural-dominated provinces with low levels of economic development are the focus of TPA policies, this result also reveals that media attention on poverty issues is related to those agricultural provinces with low economic development.

Media attention focused first on areas of extreme poverty in the central and western regions of China. Attention was then given to Gansu, Guizhou, Guangxi, Shaanxi, Hebei, Yunnan, and Sichuan. Apart from Hebei and Shaanxi, the other five provinces are currently among the seven provinces with the most poverty in China and include national-level impoverished counties. The aforementioned results indicate that impoverished regions and those with and large agrarian populations are factors attracting media attention to TPA. Xinjiang and Ningxia are provinces that have yet to eradicate poverty but lack media attention. Media attention on Ningxia was biased in the first three months of 2020.

From 2017 to 2020, provinces and cities such as Shanghai, Beijing, Tianjin, Jiangsu, Zhejiang, Tibet, Guangdong, and Liaoning lacked media coverage for several months. Tibet was the first area to eradicate poverty among areas with national-level poverty in December 2019. The remaining seven cities and provinces are located in developed areas along the eastern coast [57]. Therefore, media coverage was in line with areas' poverty level and the time at which poverty was eradicated. Particular focus was given to areas that had not eradicated poverty. The more difficult was poverty alleviation, and the longer it took, the more media coverage an area received. Provinces with relatively low poverty levels in eastern China exhibited the lowest media coverage among all the regions.

4.3. Indicators Affecting News Coverage of Poverty Alleviation

Through looking into the results of the pool effects regression model as shown in Table 5, all seven variables significant positively or negatively influenced media coverage which indicates that media attention is related to three dimensions of sustainability. As to the absolute values of the co-efficient among independent variables, TPA-related coverage mainly focused on rural economics sustainability, followed by rural community sustainability, and the least on environmental indicators.

Specifically regarding economic sustainability, "agricultural gross domestic product (GDP)" positively influenced media coverage where a 1% increase in agricultural GDP results in a 0.339% increase in media coverage. The relation between per capita disposable income of rural residents and media coverage was negative, indicating that an increase of 1% in the disposable income of rural residents decreased media coverage by 0.890%. Furthermore, the "effective irrigated area" also negatively influenced media coverage where a 1% increase in "effective irrigated area" decreased media coverage by 0.417%. These results reflected that high media attention on TPA was related to those agricultural provinces with low income and low agricultural irrigation technology.

In terms of environmental sustainability, "pollution treatment" negatively influences media coverage where a 1% increase in pollution results in a 0.167% drop in media coverage. High capital input for pollution treatment is associated with those highly developed areas with serious industrial pollution or dominated by industrialization. "Affected area of crop" positively influences media coverage where a 1% increase in affected crop area boosts media coverage by 0.117%. Combined with our result on economic sustainability, TPA-related

coverage focused more on agriculture than industry, especially those with weak resistance to weather agricultural risk.

Table 5. Pool effect regression for sustainability indicators influencing media coverage (2017–2020).

Variables	Coef	Std. Err	*t*	*p*
Intercept	5.864	0.979	5.992	0.000 ***
Rural Economic Sustainability				
Agriculture GDP	0.339	0.103	3.297	0.001 **
Rural resident Per Capita Disposable Income	−0.890	0.254	−3.507	0.001 **
Effective Irrigated Area	−0.417	0.114	−3.669	0.000 ***
Environmental Sustainability				
Pollution Control Investment	−0.167	0.04	−4.172	0.000 ***
Affected Area of Crop	0.117	0.046	2.528	0.013 *
Social/Community-level Sustainability				
Rural doctors and medical workers	0.293	0.112	2.616	0.010 *
Receiving Social Relief in Rural Areas	0.037	0.01	3.631	0.000 ***
Adjusted R^2	0.74			
F-statistic	F (7,116) = 51.134			
p	p = 0.000			

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Regarding social and community sustainability, "rural doctors and medical workers" positively influenced media coverage and ten thousand medical workers increase rural community media coverage by 0.037%. Social relief played a positive role in media coverage. For every 1% change in the number of those receiving social relief in rural areas, the media coverage positively changed by 0.293%. These results indicated that the role of media in public welfare with reporting is more associated with the input of rural community resources and solving social inequity.

4.4. Analysis of Annual Differences in Keywords Used in Media Reports

Yearly comparisons of six groups based on keywords' log odds ratios were conducted, and the top 25 keywords are presented in Figure 3. The larger the absolute value of the log odds ratio, the better the keyword can represent the prominent feature of this category. Figure 3 indicated that among the common keywords of the two years, the greater the absolute value of log ratio, the more important it can represent in that year. The closer the log ratio is to 0, the more it represents that the prominence of the word in the two years is basically the same.

Keywords in media coverage between 2017 and 2019 were different, and keywords in 2020 were also different from those in the previous three years. The keywords in 2017 were mainly related to state organs and major national conferences, such as the Ministry of Agriculture, the CPC, the Agricultural Fair, the Central Committee of the CPC, and the 18th and 19th National Congresses of the CPC. The number of keywords related to state organs used in 2017 was 1–3 times higher than that used in 2018, 5–10 times higher than that used in 2019, and over 10 times higher than that used in 2020. The number of keywords related to major national conferences used in 2017 was 1–3 times higher than that used in 2018 and 2.5–4 times higher than that used in 2020. The number of keywords related to major national conferences used in 2017 was not markedly different to that used in 2019. Policy-oriented keywords appeared frequently in 2017, and the coverage of such keywords decreased year on year. Furthermore, compared with the

keywords used in 2018, 2019, and 2020, the keywords used in 2017 focused more on the names of agricultural products, planting, and breeding and animal husbandry. These keywords were combined with keywords such as "exhibition" and "agricultural fair", which indicated that media attention focused on TPA policies and the promotion of TPA-related agricultural products.

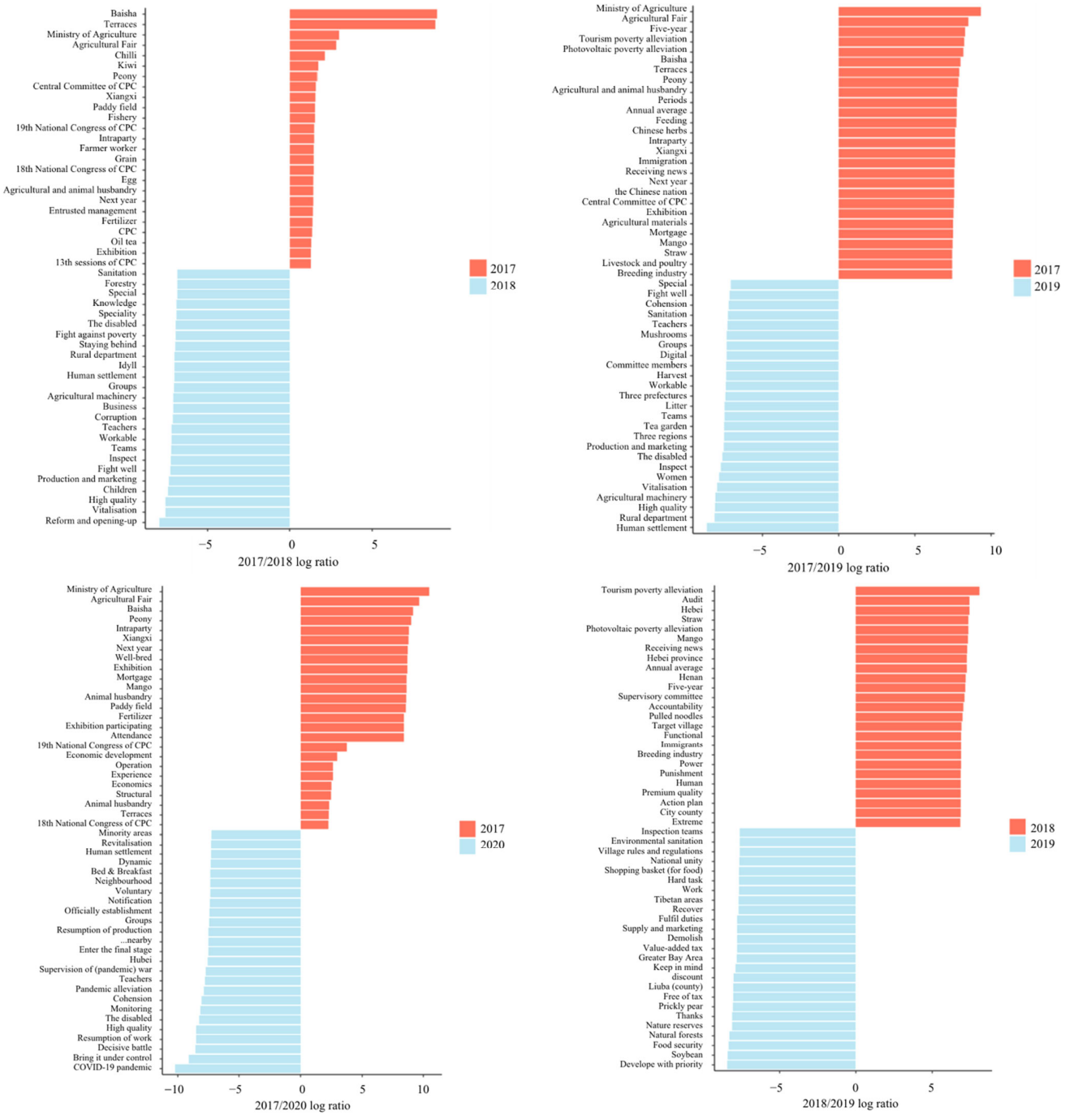

Figure 3. *Cont.*

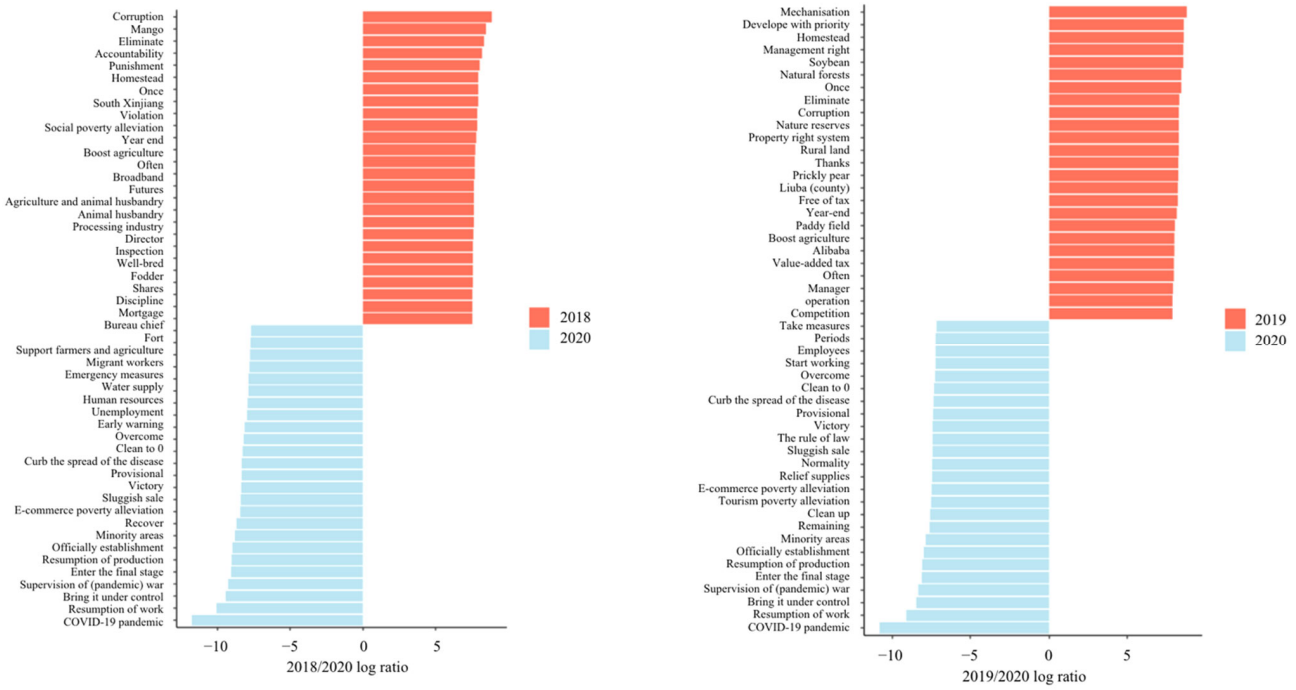

Figure 3. 2017–2020 Pairwise comparisons of keyword log ratios in different years.

In 2018, keywords related to vulnerable groups, such as "children", "staying behind", and "disabled individuals" were similar to those in 2017. Keyword similarities were also noted in relation to volunteering (e.g., "teachers", "teams", and "rural departments") and eradicating poverty (e.g., "fight well", "inspect", "engagement", and "workable"). Negative words such as "corruption" appeared in media articles, which indicated that some problems could not be ignored in terms of poverty alleviation. Keywords in 2019 were related to impoverished areas (e.g., "three districts" and "three states"), vulnerable groups (e.g., "the disabled" and "women"), and those assisting with poverty alleviation ("rural department", "team", "committee members", and "teachers"). Moreover, some keywords were related to new digital technologies and tools that can help low-income individuals in agricultural settings (e.g., "harvest of tea garden" and "mushrooms") and improve welfare in human settlements. In 2020, which was the final year in the fight for poverty alleviation, the COVID-19 pandemic became an obstacle to achieving poverty alleviation goals. Words related to the pandemic were the most prominent that year, which reflected the urgency of pandemic alleviation (e.g., "bring it under control"). Keywords such as "revitalisation" and "human settlement" were less prominent; keywords related to the top-down decisions and policies related to economic activities, such as "resumption of work", "resumption of production", and "resumption of normal life", were more prominent. Moreover, phrases such as "decisive battle" and "supervision of war" reflected the determination to persevere in the "war" against the COVID-19 pandemic in China.

Keywords related to poverty alleviation actions, such as "audit", "supervisory committee", "accountability", and "punishment" were more prominent in 2020 than in 2019. Similarly, keywords such as "corruption", "accountability", "punishment", "violation", "inspection", "discipline", and "director" were more salient in 2018 than in 2020. The aforementioned results indicated that political elites often abused their power for personal gain and violated the law, and such activities affected poverty alleviation work. Media attention in 2018 mainly focused on reflections on TPA mechanisms the exposing of related problems.

Keywords related to natural ecological environment, such as "natural forest", "protected land", "environmental sanitation", and "Tibetan area", appeared more in 2019 than in 2018, which indicated the increased focus on the fragility of the natural environment.

When combined with media coverage of contiguous areas with substantial poverty, such as the "Three Regions" and "Three Prefectures", which were used in the previous comparison involving the year 2017, media coverage in 2019 was concentrated on the spatial dimensions of ecological fragility and poverty alleviation in marginal areas such as "Tibetan areas" and "minority areas".

Compared with the keywords in 2020, those in 2019 were more related to agricultural modernisation and professional management (e.g., "mechanisation", "management right", "property right system", "operation", and "Alibaba e-commerce"). The combination of the aforementioned keywords with the word "digital" highlighted that compared with the media coverage in 2017, that in 2019 was more focused on alleviating poverty among marginalised groups in impoverished areas by using technology and modern poverty alleviation approaches. A trend of large-scale and specialised poverty alleviation measures was identified. In addition to theoretical, organisational, and institutional innovation [72], technological innovation is another means of poverty alleviation with Chinese characteristics.

In contrast to the media coverage in 2018 and 2019, that in 2020 focused on challenges to TPA work related to the COVID-19 pandemic, as indicated by the usage of keywords such as "unsalable", "migrant workers", and "unemployment". The keywords used in 2020 were related to TPA actions, such as "curb the spread of the disease", "resumption of work", "early warning", "water supply", "emergency", and "support farmers and agriculture", and achievement, such as "overcome". Furthermore, discourse on encouragement-based emotions revealed the destiny of communities sparing no effort and uniting social forces to overcome difficulties. Media empowerment is a means of poverty alleviation; it can involve maintaining social stability during the COVID-19 pandemic, stimulating the endogenous self-empowerment of low-income individuals, and promoting changes in cognition and action.

4.5. Regional Differences in Media Coverage Keywords

Term frequency-inverse document frequency (TF-IDF) measures how relevant a word to a certain category of documents, and it is widely used to extract the most representative words as features for text classification. Figures 4 and 5 display the TF-IDF results by region. The greater TF-IDF, the more representative the keyword is to distinguish the regional categories. Figure 4 shows that in each regional category, keywords with greater TF-IDF values are more representative of the region-based TPA coverage. Most of the top 20 keywords for regional poverty alleviation coverage in Figure 4 were nouns; they were related to the main crops or breeding organisms that are suitable for the local climate, soil, and natural conditions. Moreover, keywords related to the local landscapes, buildings, and customs of southwestern minority areas were salient. Agricultural contacts, business opportunities, and local industries for TPA was promoted in eastern China according to locational advantages. The Maritime Silk Road aided local poverty alleviation efforts. Poverty alleviation through business development was highlighted by the media, especially in relation to local primary industries such as arable and pastoral farming. Media coverage also focused on poverty alleviation in the central and western regions of mainland China as well as developing countries worldwide.

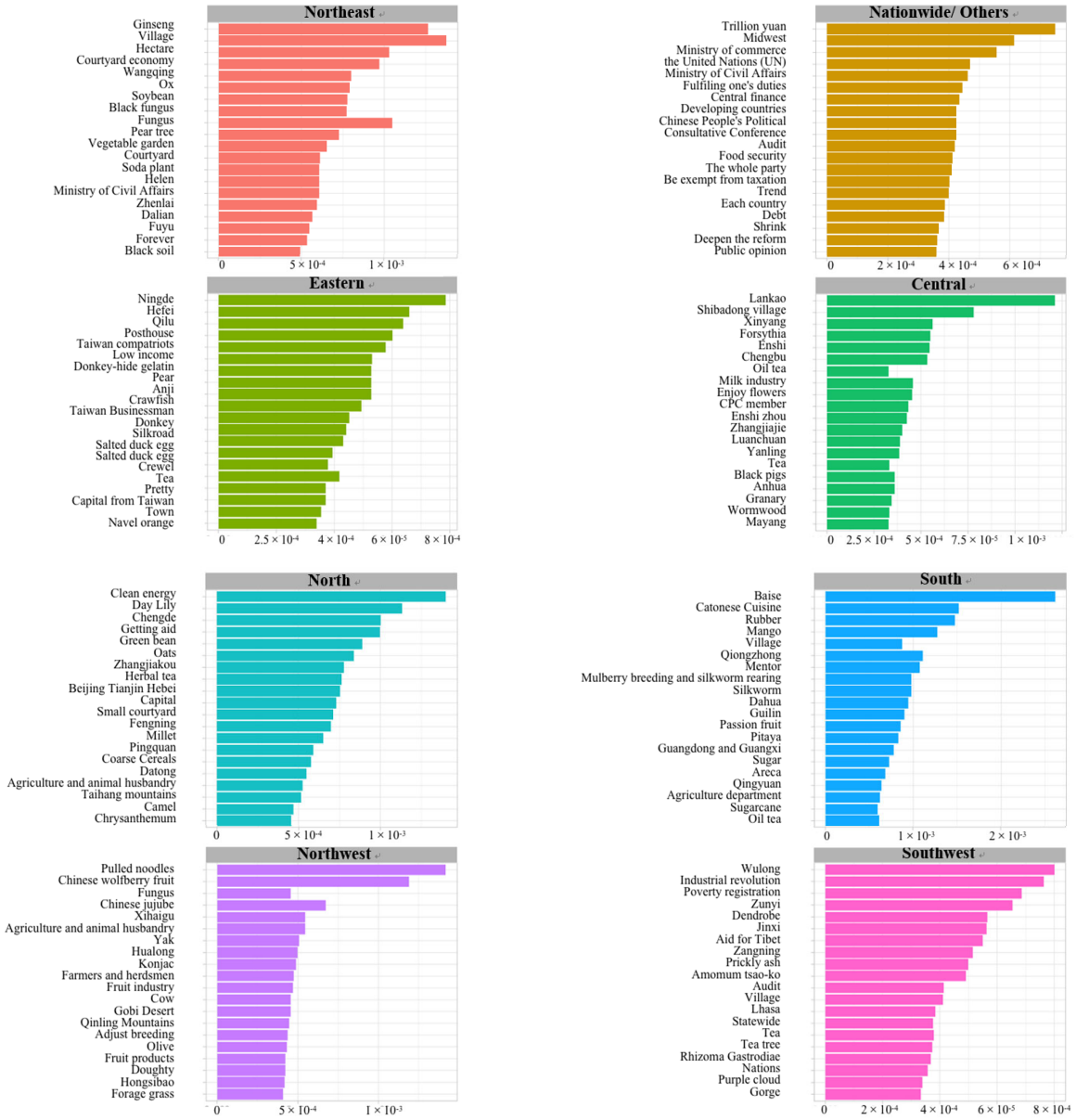

Figure 4. Term frequency-inverse document frequency (TF-IDF) results by region during 2017–2020.

Figure 5 shows that in each regional category, keywords of attributes with greater TF-IDF values can better represent the emotional characteristics of the region-based TPA coverage. As indicated in Figure 5, the top 20 keywords related to characteristics and attributes were extracted; they included adjectives, adverbs, verb, adverbs, idioms, phrases, and other modifiers. First, the number of negative words was small, and they were related to descriptions of spatial marginalisation based on geographic disadvantages. Specifically, the words "drought", "barren", "fragile", and "soil erosion" mainly appeared in media coverage of north-eastern areas, north China, and north-western and south-western regions. Words and phrases such as "live at the mercy of the elements", "make use of local resources", "formidable project", and hardship were prominent in media coverage of north-west and south-west regions, which reflected the harsh environmental conditions in western areas and the hardship of people's lives there. By contrast, numerous words and phrases with rich and diverse meanings, such as "smooth", "prosperous", "rich", "clear", "roomy", "beautiful", "make a difference", "blooming everywhere", "vigorous", "dense" and "progress", indicated that some residents in certain regions had a better

life than did those in other regions. These positive adjectives are in contrast to words associated with geographical disadvantages, which indicated that impoverished areas had been improved through TPA projects. Some positive and inspiring words and phrases, such as "heart to heart", "concerted efforts", "pragmatic", and "constant dropping wears away the stone", were also common in the media coverage of various regions. These words and phrases from positive local stories shared by local media are related to initiative and enthusiasm and emphasise the collectivist spirit of solidarity, reflecting a form of discourse empowerment.

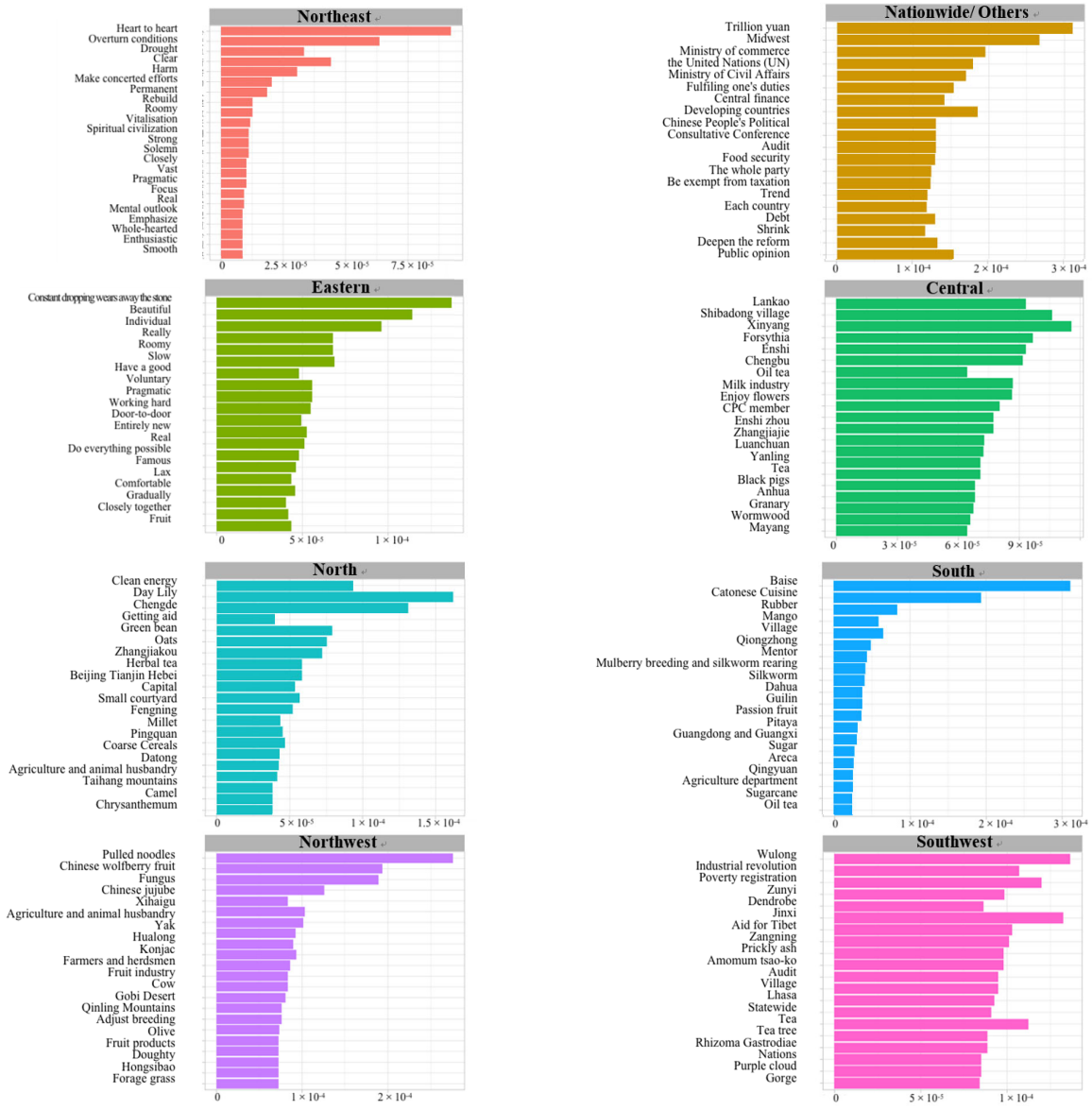

Figure 5. Term frequency-inverse document frequency (TF-IDF) results with characteristics and attributes by region during 2017–2020.

Some areas lack natural endowments and are characterised by poor living conditions, giving residents a substantial competitive disadvantage [57,85]. However, the marginalisation of spatial dimensions can also inspire people to pursue subjective initiatives of poverty alleviation. The core keywords in poverty-alleviation-related media coverage were "increasing people's confidence" and "enriching their knowledge", which reflected the collective consensus and wish for a better life after poverty alleviation.

"Weak" and "lax" were words used to describe the inaction of local party organisations. These words were common in poverty alleviation coverage related to north, south, and east China. Words and phrases related to work style, such as "mendacious", "incorruptibility", and "evil forces", were concentrated in central and southern China, which reflected the shortcomings of bureaucratic systems in achieving local poverty alleviation in these regions. Furthermore, "door to door", "focus", "emphasis", and "refined" were highlighted in the media coverage of the aforementioned regions. The aforementioned results indicated that problems existed in the local grassroot bureaus and targeted nature of TPA work.

In general, in north and west China, poverty alleviation activities were mainly focused on the poverty caused by spatial marginalisation. In central, east, and south China, poverty alleviation work was mainly conducted to overcome the poverty caused by human factors, such as the ineffectiveness of local bureaucrats. Nationwide/other media coverage emphasised that state power can solve problems caused by inappropriate local governance.

4.6. Differences in Keywords Used in Various Regions

Figure 6 shows that among the common keywords of the two regions, the greater the absolute value of log odds ratio, the more important the keyword can represent in that region. The closer the log ratio is to 0, the more it represents that the importance of the keyword in both two regions is basically the same. As depicted in Figure 6, compared with the relatively impoverished areas of the nine eastern provinces, higher media coverage, a higher frequency of certain keywords, and more diverse word types were observed for extremely impoverished areas in the 22 central and western provinces. Keywords related to ESPAR, such as "ethnic groups", "highways", and "autonomous regions", were the most prominent keywords in the 22 central and western provinces. The aforementioned results indicate that media coverage keywords in extremely impoverished areas were based on geographic marginalisation. "Farmhouse touring", "tourism poverty alleviation", "model zone", and words related to crops and livestock (e.g., "oil tea", "pepper", "walnut", "beef cattle", "prickly ash", "pig", and "kiwi fruit") as well as e-commerce poverty alleviation and infrastructure construction (e.g., "[road] hardening", "sanitation", and "green water") indicate that a modern poverty alleviation model was embedded in the extremely impoverished areas. Furthermore, the beneficial effects of poverty alleviation were highlighted through quantifiers and phrases such as "10,000 tonnes", "output value", "net income", and "more than 10,000 yuan" as well as words related to low-income groups' interests such as "10,000 households", "average household", and "net income".

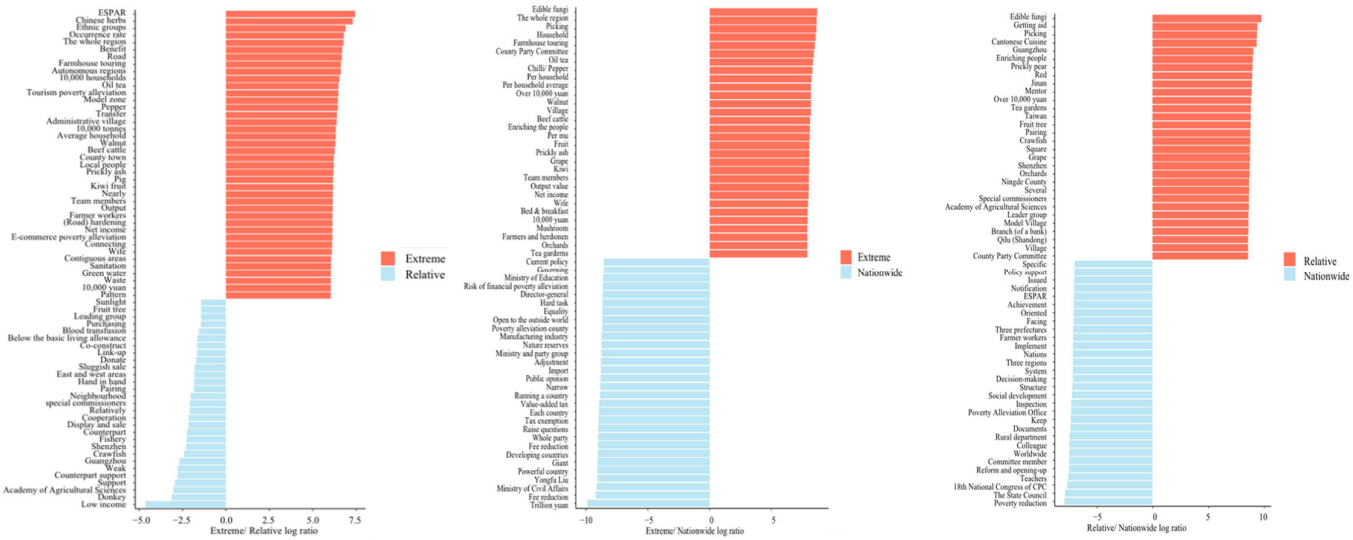

Figure 6. Log ratios of keywords by region during 2017–2020.

Terms related to arable farming were more widely embedded in the media coverage related to poverty alleviation in areas with extreme poverty than in the nationwide coverage or media coverage in other regions. Words related to agricultural crops and related products were more prominent in areas with absolute poverty (e.g., "edible fungi", "oil tea", "pepper", "walnut", "fruit", "prickly ash", "grape", "kiwi fruit", and "mushroom") than in other areas. Words and phrases related to leisure and amusement, such as "picking", "farmhouse touring", "bed & breakfast", "orchard", and "tea garden", were connected with people's livelihood (i.e., "enriching the people"), which indicates that for areas with extreme poverty, poverty alleviation emphasised the revitalisation and activation of rural life. The promotion of administrative forces (words such as "county party committee") was the main driving force of poverty alleviation in extremely impoverished areas. Finally, similar to the keywords related to the media coverage of relatively impoverished areas, words related to profit, achievements, and the interests of low-income households highlighted the effectiveness of poverty-alleviation-related governance.

Lower media coverage and fewer types of keywords were noted for the relatively impoverished areas than for the extremely impoverished areas; however, the meanings of the keywords used in the media coverage of the relatively impoverished areas are somewhat flourish. First, in terms of geographical locations and the effects of climatic and environmental factors (e.g., water, soil, and precipitation), the extremely impoverished provinces in the central and western regions were suited to arable farming and animal husbandry. The provinces located in eastern coastal areas were more suited to the development of the aquaculture industry. Second, some words and phrases such as "support", "counterpart support", "cooperation", "pairing", "hand in hand", "co-construct", and "blood transfusion" (to give aid and support) revealed poverty alleviation to be a common social mission involving solidarity that shaped the collective consensus of communities. In contrast with the action of getting rid of poverty in extremely impoverished areas, the poverty alleviation mechanisms in relatively impoverished areas involved prosperity of industry specialisation and urbanisation (e.g., see words and phrases such as "Academy of Agricultural Sciences", "special commissioners", "Neighbour", and "below the basic living allowance").

In contrast to the nationwide coverage or media coverage in other regions, the media coverage in relatively impoverished areas included keywords related to leisure-oriented arable agricultural activities such as "orchards" and "tea gardens". Media attention was concentrated on the south-eastern areas of China, especially Guangdong and Fujian, which indicated that the media paid more attention to the TPA practices of these areas with developed agricultural industries than it did to those of other areas. Media coverage of relatively impoverished areas was related to local practices and assigned developed areas the social responsibility to pursue the values of "sharing" and "great harmony".

Different from media coverage of extremely impoverished areas, international poverty alleviation strategies and domestic industrial poverty alleviation modes, such as manufacture and finance were highlighted in nationwide/other coverage. Examples of words and phrases used in nationwide/other media coverage are "powerful country", "giant", "developing countries", "whole party", "all nations" and "running a country", and examples of words and phrases related to international commerce are "tax reduction", "fee reduction", "exemption", "value-added tax", "import", "open to the outside world", and "equality". Moreover, words related to bureaucracies such as "Ministry of Civil Affairs", "Ministry and Party Group" and "Ministry of Education" as well as words related to officials" statuses and positions such as "Liu Yongfu" and "Director-general" indicated that poverty alleviation measures at the international and national level were dominated by bureaucracies with a top-down approach.

Compared with media coverage of relatively impoverished areas, state-dominated coverage and coverage of extremely impoverished areas were highlighted more in nationwide and other media coverage. By contrast, local autonomy was more important than administration-led activities in relatively impoverished areas. Nationwide/other media coverage paid attention to international assistance, especially among developing countries,

and the coverage of extreme poverty in China was also emphasised. The aforementioned results are consistent with the concept of an "environmentally bundled economic interest", which indicates that China's local governments fulfil the central government's new political mission and satisfy the demand for local economic development [90].

5. Conclusions, Contributions, and Limitations

This study employed regression analysis of panel data and content analysis with a text mining approach to investigate the spatiotemporal distribution and influence factors of Targeted Poverty Alleviation (TPA)-related coverage, and keywords embedded in media coverage. The results of this study revealed that, first, the media coverage was higher in central inland areas than in southeast coastal areas. Each year, more attention was given to relatively impoverished areas than to extremely impoverished areas in nationwide/other media coverage. Second, regarding temporal characteristics, media coverage on poverty alleviation was high in 2017 and 2018, low and scattered in 2019, and high in 2020. The monthly distribution of media coverage was characterised by a midyear peak and a peak at the end of the year. These patterns conform to the schedule of important political events, such as committee meetings. Third, the temporal distribution of media keywords demonstrated that policy propaganda was highlighted in 2017, diversified group characteristics and problem exposure of local TPA practice were emphasised in 2018, digital and modernised practices were prominent in 2019, and positive actions for addressing the poverty caused by the COVID-19 pandemic were highlighted in 2020.

For the purpose of poverty alleviation, there are several trade-offs between economic, environmental, and community/social sustainability. Factors influencing TPA-related coverage are significantly related to key economic, environmental, and community sustainability indicators we evaluated. Specifically, high media attention on TPA is related to those agricultural provinces with low income, low agricultural technology, and weak risk resistance capacity in agriculture rather than those highly developed areas dominated by industrialisation. Furthermore, media as a social power of poverty alleviation tends to be associated more with the input of community resources and addressing social inequity.

Keywords describing extremely impoverished areas emphasised spatial poverty, the welfare of low-income households, the revitalisation of rural areas, and the effectiveness of poverty governance. Keywords related to relatively impoverished areas focused on local autonomy in developing diversified industries, collective responsibility, and the concept of sharing and harmony in rural China. China's local governments developed an approach based on "environmentally bundled economic interests" that simultaneously fulfils the central government's new political mission and local economic development. Finally, the positive discourse in media coverage indicated that TPA stakeholders pursued subjective initiatives. This result is consistent with the finding of Tsai and Liao [91] that poverty alleviation has been promoted with substantial enthusiasm. Consequently, media coverage was consistent with China's poverty alleviation mechanism. The implementation of TPA policies from top to bottom can be promoted effectively, and campaign-style enforcement can be achieved.

Previous policy following a "pollute first, clean up later" linked to the idea of progressive economic development, which led poverty alleviation only focused on agricultural intensification and progressive economics development but with limited understanding of the impacts on ecological dynamics [92]. Environmental degradation leads to lower agricultural outputs and rural incomes [93]. For example, rice yields declined due to increasing fertilizer application rates [94]. In addition, losses of cultivated land transferred to other land uses due to urbanization in some regions [92]. However, compared with 69.10% of agricultural land use composition in 2008 [75], statistics in 2019 is 72.49%; especially cultivated land had increased from 12.80% to 13.30% [76]. Consequently, combined with the results of media attention and media discourse in this study, environmentally bundled economic interests and social participation of current Targeted Poverty Alleviation creates trade-offs and synergetic relationships, which made implementation of TPA effective.

This study contributes to the poverty governance literature through various means. First, in terms of theory, this study not only extends the importance of the marginality theory of poverty governance but also provides a theoretical marginality-based perspective for understanding poverty governance in media settings. Second, this study is the only one to use text mining to examine the representations of Chinese TPA in online media for providing an integrative perspective of TPA media representation. Third, the results of this study are vital for understanding poverty governance in different regions through dynamic patterns of media coverage and keywords related to TPA, especially in regions where poverty alleviation projects and social capital are seldom combined. The results of this study can provide insight for local governments to assess local poverty scenarios and for the central government in terms of allocating resources to poverty alleviation.

Regarding practical implications, this study can inspire new strategies for alleviating poverty in various regions. First, for extremely impoverished areas, this study revealed that the top-down administrative-led approach was used to overcome spatial poverty; after poverty is eradicated, market-oriented operations and full local autonomy should be learned from eastern areas to establish a long-term mechanism for poverty alleviation. Second, the growth of China's agricultural industry is particularly crucial for poverty alleviation. This industry is four times as effective in reducing poverty as secondary and tertiary industries are [85,95]. In this study, the spatial distribution of media attention was focused on large agricultural provinces with large agrarian populations; these provinces are major bases for high-quality agricultural products in China. The keywords embedded in media coverage indicated that throughout all the study years, agricultural product promotion in extremely impoverished areas and the experiences of economically developed agricultural areas were essential for poverty eradication. As technical efficiency is one assessment of agricultural economic sustainability, accordingly, poverty alleviation projects of the agricultural industry should be combined with modernised technological innovations to achieve poverty alleviation with Chinese characteristics.

This study provides strategies related to antipoverty governance for the media in the postpoverty era. First, for extremely impoverished areas, the media should pay more attention to the process of local TPA by comparing regional differences in media ecology in areas with similar natural endowments or geographical proximity to establish a long-term mechanism for the media's representation of TPA approaches. Second, news media is considered a major force against poverty, keywords in media coverage indicated discourse empowerment with the dual function of increasing people's confidence and enriching their knowledge. This coverage focused on local stories on getting rid of poverty and becoming rich. Thus, media discourse should focus on providing detailed microlevel perspectives on local TPA cases instead of brief descriptions. Positive local stories should be shared by local media as a form of discourse empowerment to inspire low-income households to pursue self-empowerment. Third, media coverage should improve public awareness of TPA sustainability and promote an optimal mechanism established for the agricultural sector and the rural community of impoverished areas.

Inevitably, several limitations hindered this study. First, the term frequency-inverse document frequency (TF-IDF) and log odds ratio were used in this study. These parameters focus on keywords embedded in articles but not on topics. In future research, latent Dirichlet allocation, which is a topic modelling algorithm for extracting topics present in sets of patent documents, will be adopted [96]. Subsequently, the trends of different topics represented in media coverage will be explored. Second, although NTV (www.ntv.cn, accessed on 1 January 2021) as a convergence platform integrates mainstream news sources and news from state-controlled media and local media, the expressions of individuals such as bloggers and opinion leaders are lacking. Prospective studies could enable deeper interpretations than the current format affords by including diverse media voices and conducting different analyses. Finally, the TPA approach was proposed in November 2013; however, news articles in this study covered only the three years before China eradicated

absolute poverty in November 2020. Thus, NTV does not provide sufficient information on the TPA in China over time.

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