

# Agriculture and International Organization in Indonesia: The Twitter Analysis of FAO Indonesia

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**Abstract.** World agriculture confronts diverse challenges, including climate change, food security, soil degradation, water scarcity, biodiversity loss, and rural poverty. Addressing these interlinked issues necessitates a collaborative, multidisciplinary approach involving governments, farmers, scientists, civil society, and international organizations. Understanding the role of the Food and Agriculture Organization (FAO) in Indonesia is pivotal. Analyzing the Twitter activities of FAO Indonesia (@FAOIndonesia) provides insights into their efforts related to Indonesian agriculture. This study employs qualitative content analysis, utilizing NVivo software to assess sentiment, dominant themes, and specific topics within @FAOIndonesia's Twitter account. The findings reveal a prevalence of negative sentiment over positive sentiment in FAO Indonesia's Twitter discourse. Furthermore, the dominance of "https" in word frequency indicates that FAO Indonesia primarily shares links to access detailed information on agriculture issues, rather than providing comprehensive information directly on Twitter. This research yields significant insights into agriculture issues in Indonesia, valuable for policymakers and international organizations operating in the country, highlighting the need for more direct communication and information dissemination to address the multifaceted challenges facing agriculture.

## 1 Introduction

Climate change, food security, soil degradation, water scarcity, biodiversity loss, and rural destitution are some of the challenges facing global agriculture[1,2]. Despite being referred to as an agricultural nation, Indonesia has a serious problem with food security. The issue of poverty, limited access to land, and the challenge of addressing the issue of climate change are just a few of the causes that have contributed to the problem of the food crisis in Indonesia [3]. Agriculture and food policy are two areas of political economy that have strong connections to international relations (IR). Indeed, the global food supply chain is

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being seriously impacted by vested political and economic interests that are driving diverse global agriculture problems [4]. The complexity and interconnectedness of these problems necessitates a multidisciplinary approach involving governments, farmers, scientists, civil society, and others to discover long-term, effective solutions, including international organizations [5].

Previous research has shown that agriculture and international organizations work closely together to solve agriculture challenges all over the world. However, agriculture and international organizations research appears to be disfavor among scholars of international relations. In fact, a few studies have attempted to determine the function of international organizations in various regions, with the vast majority highlighting their success in fostering development. A research asserted that international organizations play a crucial role in promoting sustainable agriculture and food security in Africa, one of which employs a technological approach [6]. Close cross-sectoral collaboration between Food and Agriculture Organization (FAO) and community organizations, business groups, multinational corporations, and transnational entities is extremely beneficial in resolving global concerns [7]. FAO has been recognized for its success in combating global hunger, food insecurity, poverty, malnutrition, and other concerns since its founding [8]. Although the FAO has had some success in resolving global food and agriculture problems, its achievements are largely unknown outside of the organization [9].

Information is widely disseminated and accessible in today's digital age [10]. Information about government initiatives and policies, as well as international organizations, can be disseminated efficiently through social media platforms like Twitter [11]. Likewise, academics and the public can use Twitter to discover relevant programs and information, such as that related to global agriculture. Utilizing the sophistication of information technology and artificial intelligence (AI), agricultural data sets are readily accessible [12,13]. Therefore, this study is essential since it will investigate the role of the FAO organization in Indonesia through a Twitter analysis of the @FAOIndonesia account. The purpose of this article is to investigate FAO Indonesia's Twitter activity relating to agriculture concerns in Indonesia using the @FAOIndonesia Twitter account.

## 2 Literature Review

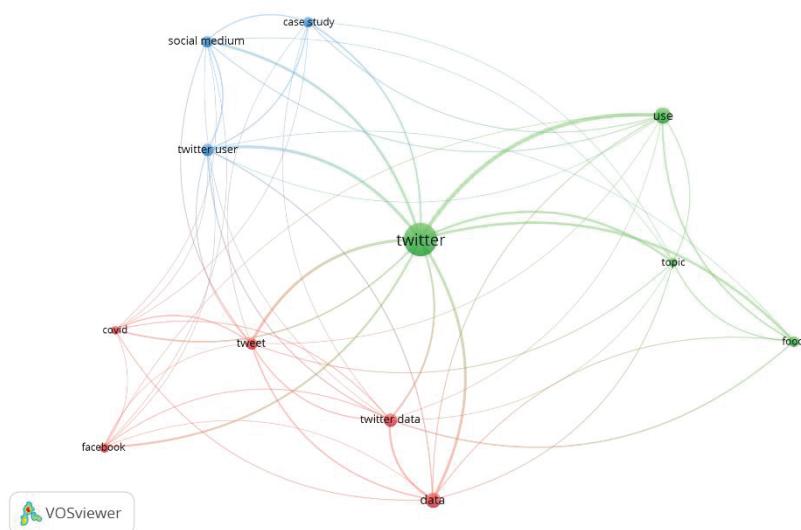
### 2.1 Global Agriculture and Twitter

Researchers rarely investigate global agricultural issues or analyze social media, particularly Twitter and its relationship to international organizations. Some scholars are looking into how agricultural and educational research institutions use Twitter to disseminate information, particularly in Mexico [14]. Others examine Twitter's discourse on the application of artificial intelligence (AI) to sustainable agriculture [15]. Several academics, including those in Korea [16], the United States [17], and Indonesia [18], conducted Twitter analyses on the government's role in agriculture. Some studies also analyze Twitter within the framework of "smart farming" discussions [19,20]. The study of communication patterns on the Twitter platform by various institutions appears to be the most popular among researchers.

As stated in the introduction to international organization research, various academics have investigated the role of FAO in Africa and other regions. However, a study on the role of the FAO in Indonesia appears to be an unappealing topic for academics. According to the author, there are only a few articles that expressly mention FAO in Indonesia. For example, consider FAO's engagement in food security projects in Indonesia in general [21], and specifically in Papua [22] and West Nusa Tenggara [23]. Then there is one paper that

examines the function of FAO in Indonesia in climate change [24]. There is no research that specifically addresses FAO's position in Indonesia via the lens of social media, particularly Twitter.

Figure 1 demonstrates that bibliographical analysis using the Vosviewer program reveals that previous studies are more interested in addressing agricultural and social media platforms like Twitter and Facebook. However, there have been no studies on the function of international organizations in social media analysis, and it seems like this is one of the first to appear. Of course, this study of social media and international organizations triggering other researchers to further develop this area of study.



**Fig. 1.** Vosviewer analysis on agriculture and international organization research

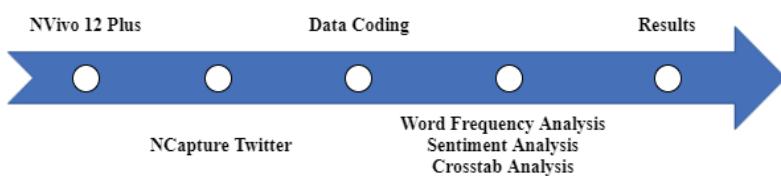
### 3 Method

This is a descriptive qualitative content analysis of FAO-representative Twitter discussion in Indonesia. This paper endeavors to examine agriculture issues in Indonesia through the social media lens of the international organization @FAOIndonesia. The descriptive qualitative approach represents a research methodology applied in the domains of social sciences, education, and various other academic disciplines. Its primary purpose is to offer a thorough, intricate, and all-encompassing portrayal of the subject of investigation. This approach centers on elucidating and comprehending the attributes, characteristics, and subtleties of a specific subject, occurrence, or societal environment [25].

This method entails a thorough analysis of the data to recognize recurring themes, patterns, and groupings. Researchers do not employ statistical or numerical assessments; rather, their aim is to grasp the fundamental connotations and surroundings. Descriptive qualitative investigation prioritizes the comprehension of the circumstances in which the phenomenon transpires. Researchers investigate how the subject is situated within its social, cultural, and environmental setting [26]. The author uses NVivo 12 plus (QRS International, Burlington, Massachusetts, USA), a computer-assisted qualitative data analysis system (CAQDAS), to analyze the @FAOIndonesia Twitter dataset and extract useful information such as sentiment analysis, dominant words, top influencers, most-mentioned users, and trending hashtags.

NVivo 12 Plus was used for data mining using the Twitter Application Programming Interface (API) on February 7, 2023, at 14:45 Western Indonesia Time (seven hours ahead of GMT). Since NVivo comes with sophisticated tools like NCapture, it can securely mine and store Twitter data. In general, NCapture tools is a free online browser add-on for Google Chrome that enables the gathering of web material, including Twitter microblogs and allows for its importation into the NVivo program. After collecting the Twitter dataset, NVivo might perform the following operations: encode, classify, and display data.

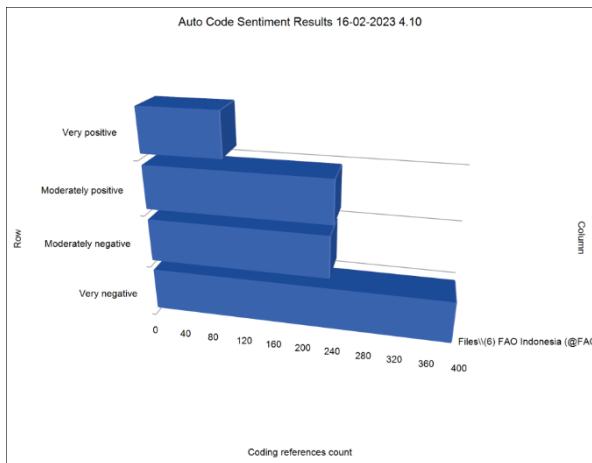
In total, 2951 tweets were crawled. Following the crawling of the dataset, NVivo 12 Plus was used for coding and analysis, including word frequency, sentiment analysis, and crosstab analysis. Following the analysis stage of the Twitter dataset using NVivo, the data results are presented in a report. These stages are illustrated in the figure below.



**Fig. 2.** Stages of data mining and analysis using NVivo 12 Plus

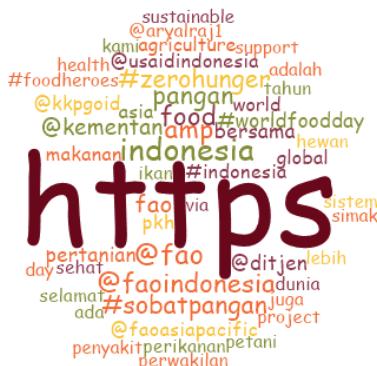
## 4 Results and Discussion

Some interesting facets of the spread of information on agricultural issues were uncovered in an analysis of the Twitter account @FAOIndonesia. Social media data for the @FAOIndonesia Twitter account, including sentiment analysis, influencers, top hashtags, most mentioned users, and word dominance, are the topic of this study. Several findings are presented in the subsequent paragraphs after the author completes the coding process using NVivo 12 plus. In the context of sentiment analysis, the substance of Twitter tweets on the @FAOIndonesia account, for example, tends to be negative. According to Figure 3, the value of "very negative" is significantly higher than the positive elements, even when the "very positive" and "moderately positive" elements are combined. Obviously, this is a strong indication that the information contained in the FAO account is dominated by negative messages regarding agricultural issues in Indonesia, which are indeed fraught with difficulty [3,27].



**Fig. 3.** Sentiment analysis of @FAOIndonesia

Meanwhile, in terms of word frequency revealed that “[https](https://)” is the most dominant word compared to other agriculture related dictions such as agriculture, sustainable, health, and other (see Figure 4). Additionally, there are also appear minor words in Indonesian language such as *pangan/food*, *makanan/food*, *petani/farmer*, *pertanian/agriculture*, *hewan/animal*, and others. The dominance of “[https](https://)” demonstrates that in Twitter chats, @FAOIndonesia frequently shares agricultural information in the form of website links that contain more extensive information. This is due to Twitter's character limits, which range from 140 to 280 characters [28]. As a result, @FAOIndonesia must provide additional information on agricultural concerns that is available on other online pages.



**Fig. 4.** Word-cloud analysis of @FAOIndonesia

Meanwhile, the @FAOIndonesia analysis reveals an interesting pattern in the context of the most popular accounts or influencers. Following the analysis, five of the most influential Twitter accounts in the agricultural discourse were chosen, all of which turned out to be accounts affiliated with international organizations (Table 1). Apart from the most popular account, @FAOIndonesia, it turns out that there are additional accounts still related to the FAO organizational network, such @FAOAsiaPacific, @FAO, and @FAOfish. Interestingly, the UN account as the main body of FAO, yet it belongs to its Indonesian network, particularly @UNinIndonesia. Table 1 also demonstrates that the number of followers does not determine a Twitter account's popularity. In fact, @FAO, which has the most followers (613,623), is ranked third most popular behind @FAOIndonesia and @FAOAsiaPacific, all of which have significantly fewer followers than @FAO, and even fewer than the fourth and fifth most popular, namely @UNinIndonesia and @FAOfish.

**Table 1.** Top five influencer

No.	Twitter account name	Account type	Followers	No. Reference
1	@FAOIndonesia	International organization	5641	2081
2	@FAOAsiaPacific	International organization	7582	119
3	@FAO	International organization	613,623	108
4	@UNinIndonesia	International organization	23,388	53
5	@FAOfish	International organization	44,388	46

In contrast, the analysis of the most-mentioned accounts in @FAOIndonesia reveals a different pattern. In addition to accounts related to international organizations in the agricultural sector, there are accounts belonging to the Indonesian government, including the account of the Indonesian Ministry of Agriculture (MoA), @kementan, and the account of the Directorate General of Livestock and Animal Health, MoA, @ditjen\_pk. This

demonstrates that FAO Indonesia exchanges information with Indonesian agricultural authorities via its Twitter account in order to disseminate information regarding agricultural issues. However, the preponderance of the most-mentioned accounts is still those of international organizations in the agricultural sector (see Table 2).

**Table 2.** Top five most mentioned users

No.	Twitter account name	Account type	No. Reference
1	@FAO	International organization	415
2	@FAOIndonesia	International organization	353
3	@kementan	Indonesian Ministry of Agriculture (MoA)	235
4	@ditjen_pkh	Directorate General of Livestock and Animal Health, MoA	153
5	@FAOAsiaPacific	International organization	152

Meanwhile, an analysis of the most popular hashtags revealed that #sobatpangan (for local audiences) was the most popular ( $n = 315$ ). The hashtag #sobatpangan is Indonesian for "food friend" and is used to greet agricultural communities in Indonesia. Other English hashtags rank lower, such as #zerohunger ( $n = 272$ ), #worldfoodday ( $n = 152$ ), and #foodheroes ( $n = 84$ ). There is one hashtag that can be used to represent both local and international audiences: #indonesia, which ranks fourth ( $n = 140$ ). The popularity of the hashtag (Table 3) also demonstrates that @FAOIndonesia uses the hashtags #sobatpangan and #indonesia in the form of tweets, retweets, and mentions to distribute agricultural information throughout Indonesia. Likewise, English hashtags are intended for a global audience.

**Table 3.** Top five hashtags

No.	Hashtags	No. Reference
1	#sobatpangan	315
2	#zerohunger	272
3	#worldfoodday	152
4	#indonesia	140
5	#foodheroes	84

Overall, this section demonstrates how Twitter information can broaden horizons, including knowledge about agriculture in Indonesia, through social media debates. Although there are limitations, the FAO representative office in Indonesia uses Twitter to disseminate agricultural issues, particularly in Indonesia, through messages delivered to audiences. However, the presence of a website capable of providing comprehensive information serves as a resource for the community at a time when Twitter itself has limited space and character. In general, the @FAOIndonesia account dominates agricultural-related Twitter conversations in Indonesia. However, according to the sentiment analysis, most of the discussions had negative sentiments. Additionally, other international organizations' accounts are also closely related to @FAOIndonesia's discussions about agriculture in Indonesia. Local Twitter accounts, especially those administered by the Indonesian agricultural authority, play a smaller role in the agricultural debate in Indonesia.

## 5 Conclusion

Using the @FAOIndonesia Twitter account, this study demonstrates that social media analysis, such as Twitter, can be used to map information on agricultural challenges in Indonesia. In spite of negative sentiment, recent research on the dynamics of agriculture in

Indonesia exposes an intriguing trend. For instance, websites were the primary source of information, yet peripheral topics such as food, farms, and animals appeared. The suggestions and ramifications of this research underscore the yet unexplored possibilities of employing social media as a research instrument. They stress the significance of thorough inquiries into the origins and characteristics of data, public feelings, and the interplay between secondary and primary subjects in agriculture to achieve a more all-encompassing comprehension and successful alleviation of agricultural predicaments in Indonesia. The research highlights the capacity of social media platforms, like Twitter, as a valuable instrument for charting and comprehending agricultural difficulties in particular geographical areas, such as Indonesia. This suggests that scholars can leverage the capabilities of social media data to acquire immediate understanding into the public's emotions and conversations regarding critical agricultural topics. Subsequent investigations can expand on this strategy to delve further into the populace's viewpoints and worries pertaining to agriculture.

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