International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

The Impact Of Forest And Land Fires On Income And Economic Activities Of The Informal Sector In Pekanbaru City In 2026

Eriyati[1], Anazwa Yulia Siregar[2], Arif Rahman Tanjung[3], Jovan Antolin[4], Mia Lestari[5], Musdalifah[6], Nur Rahma Adila Rasyada[7]

[1,2,3,4,5,6,7]Development Economics Study Program, University of Riau

Abstract

Negotiation is Forest and land fires (karhutla) are an annual ecological disaster that triggers a haze crisis, reduces air quality, and disrupts people's mobility and economic activities. The most severe impact of this crisis is felt by informal sector actors who are highly dependent on physical interactions and daily transactions in open spaces. This journal article aims to analyze the condition of forest and land fires in Pekanbaru City throughout 2026 and critically examine their impact on the economic activities of informal sector actors, including street vendors (PKL), micro, small, and medium enterprises (MSMEs), as well as motorcycle taxi drivers and informal transportation service providers. This study was compiled using a literature study approach and comprehensive secondary data analysis that integrates official local government documents, reports from meteorological and environmental agencies, previous academic studies, and verified mass media monitoring. Official records from the Regional Disaster Management Agency (BPBD) and related agencies show that during the period of January–September 2026, forest and land fire extinguishing and management in Pekanbaru covered an area of 106.8 hectares at 196 incident points spread across 14 sub-districts, with the Air Pollutant Standard Index (ISPU) reaching the Very Unhealthy category (>200). Synthetic analysis results indicate that the haze reduced consumer mobility and triggered distance learning (PJJ) policies, resulting in a decrease in daily turnover for informal business actors ranging from 30% to 80% in business units that rely heavily on direct consumers. However, the impact is asymmetric and varies depending on the sales location, type of goods/services, and flexibility in switching to digital ordering channels. This study recommends the need for a social safety net scheme, MSME credit relaxation, and integration of an occupational health early warning system for informal sector actors in forest and land fire-prone areas.

Keywords: forest and land fires, haze, informal sector, MSMEs, Pekanbaru, literature study

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

INTRODUCTION

Forest and land fires (karhutla) are an environmental issue and a recurring ecological disaster that have systemic consequences for public health, social dynamics, and regional economic sustainability. In Pekanbaru City, Riau Province, the impact of karhutla manifests directly through exposure to dense haze that reduces visibility, pollutes ambient air quality, and significantly restricts outdoor activities. This sudden change in people's daily mobility patterns automatically disrupts the structure of local economic activity, particularly in sectors that rely heavily on the physical presence of consumers and the rapid circulation of cash.

This study focuses on the urban informal sector—an economic segment that includes street vendors (PKL), food stall owners, culinary micro, small, and medium enterprises (MSMEs), conventional and online motorcycle taxi drivers, and other informal transportation providers. The daily income of this informal worker group is closely linked to the number of pedestrians (foot traffic), the duration of operating hours in open spaces, and the smooth operation of public transportation. When local governments implemented policies urging reduced outdoor activities and distance learning (PJJ) due to the worsening Air Pollutant Standard Index (ISPU), businesses that rely on face-to-face customers experienced a drastic decline in daily cash flow. Conversely, businesses that were able to adapt through digital delivery services have the potential to mitigate some of the risk of declining sales, so the dynamics of the impact of forest and land fires across informal sub-sectors are not uniform.

Empirically, verified media reports such as Bisnis.com by Sihotang (2026) describe that the threat of haze in Riau suppresses household consumption levels and disrupts supply chains in the culinary sector, local transportation, and small businesses. Empirical illustrations in Pekanbaru City reported by Pekanbaru TV (2026) document the variation in impacts on the ground: a street vendor reported a 30% decrease in turnover and adjustments to sales hours, while another vendor in a different location stated that their sales levels were relatively stable. This phenomenon emphasizes the importance of carefully examining the variability of informal economic impacts through an academic lens.

In the scientific literature, research by Zahtamal et al. (2023) analyzed the correlation between the distribution of hotspots and declining air quality in Pekanbaru City. A previous study by Muksin (2006) also highlighted how haze pollution disrupts urban environments and social infrastructure. At the macro level, the Ministry of Environment and Forestry (KLHK, 2022) and a World Bank report (2019) noted that losses from forest and land fires not only affect ecosystems but also trigger the loss of effective workdays, burden of medical costs, and decline in Gross Domestic Product (GDP).

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

However, most previous scientific literature has focused on physical health impacts (ARI cases), government policy evaluations, or analyses of impacts on the formal sector (such as aviation and forestry). The availability of integrated scientific studies that reconstruct the transmission pathways of forest and land fire impacts on the economic dynamics of the urban informal sector in Pekanbaru remains very limited.

Based on this background, this study formulates three main objectives:

Comprehensively describes the condition of forest and land fires and the severity of haze in Pekanbaru City throughout 2026 based on a synthesis of official data from government agencies and environmental monitoring.

Describes the impact transmission pathway and the magnitude of changes in turnover, working hours, and mobility for informal sector actors (street vendors, MSMEs, and motorcycle taxis).

Identifying strategic policy implications and formulating a further empirical research agenda to strengthen the economic safety net for informal workers in areas prone to environmental disasters.

RESEARCH METHODS

1.1 Research Approach

This study uses a descriptive qualitative approach based on a literature review and secondary data analysis. This approach was chosen because the manuscript is structured as an analytical synthesis of various data, official reports, scientific journal articles, and public documents recorded throughout the forest and land fires in Pekanbaru City and its surrounding areas in 2026. The study focuses on thematic interpretation and construction of economic impact pathways without involving primary field data collection (non-empirical primary field surveys).

1.2 Secondary Data Sources

The secondary data collected and analyzed in this study are grouped into four main categories: Official Documents of Government and Meteorological Institutions:

Recapitulation of burned land area and number of forest and land fire incidents from the Pekanbaru City Regional Disaster Management Agency (BPBD) and the Riau Province BPBD (2026). Data on smoke distribution monitoring and water availability/drought conditions from the Meteorology, Climatology, and Geophysics Agency (BMKG, 2026). Health case records (ARI) from the Pekanbaru City Health Office and releases from the Ministry of Environment and Forestry (KLHK, 2022).

International/National Research and Financial Institution Report: World Bank's report on the economic losses of forest and land fires in Indonesia (World Bank, 2019).

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Projected study of the economic impact of forest and land fires in Riau and nationally by the Center of Economic and Law Studies (CELIOS, 2026).

Verified Mass Media Reporting: National and local news (Pekanbaru TV, Bisnis.com, Kompas.com, CNA Indonesia, BBC News Indonesia, Suara.com, iNews, Kontan, Zona Satu News, Periskop.id, Metro TV, and GoodStats).

Accredited Scientific Journals and Previous Studies: Scientific articles on the correlation between ISPU, public health, and the informal economy (Zahtamal et al., 2023; Awaluddin, 2016; Muksin, 2006; Efendi & Suyanto, 2022).

1.3 Data Collection and Filtering Techniques

Secondary data collection was conducted through document searches (documentary study) with specific keywords: "Pekanbaru forest and land fires 2026", "economic impact of the informal sector", "turnover of street vendors due to haze", and "losses from Riau forest and land fires".

Data screening criteria include: Inclusion Criteria: Public documents and media releases published in the 2026 period (or relevant baseline studies), located specifically in Pekanbaru City/Riau Province, and clearly listing indicators for forest and land fires, health, or business income.

Regional Comparative Criteria: Forest and land fire impact reports from other affected areas (such as Central Kalimantan and South Sumatra) are used to a limited extent as a comparative benchmark while still emphasizing the context of the location.

1.4 Data Analysis Techniques

The collected secondary data was processed through three stages of thematic qualitative analysis:

Data Reduction and Thematic Grouping: Filtering raw data from news and reports into main sub-themes (forest and land fire indicators, public health, impact of street vendors/MSMEs, impact of motorcycle taxis/transportation, and macro loss estimates).

Data Source Triangulation: Comparing claims or findings from media reports with official government reports (BPBD/BMKG) and official statistical data to ensure the validity of the information.

Analytical Synthesis and Conclusion Drawing: Logically reconstructing the transmission flow of the economic impacts of forest and land fires and compiling recommendations for policy implications for protecting the informal sector.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

RESULTS AND DISCUSSION

1.1 Forest and Land Fire Conditions in Pekanbaru City in 2026

Based on the official publication of the Pekanbaru City Government (2026a), land fire management and extinguishing activities in Pekanbaru City during the period from January to September 2026 recorded a total burned area of 106.8 hectares with an accumulation of 196 fire incident points spread across 14 sub-districts. The recapitulation report of the Riau Province BPBD as of September 27, 2026, recorded a figure of 106.73 hectares for Pekanbaru City and a total of 20,597.23 hectares for Riau Province (Riau Province Media Center, 2026). The slight difference of 0.07 hectares is suspected to have originated from the update of the final extinguishing time and rounding of statistical figures. A summary of forest and land fire indicators for Pekanbaru and Riau in 2026 is presented in Table 1.

Table 1. Summary of Forest and Land Fire Information in Pekanbaru City and Riau Province in 2026

Indicator	Reported Values / Data	Sources & Scope of Information
Area of Burned Land (Pekanbaru City)	106.8 ha (or 106.73 ha as of 27 Sept)	January–September 2026; Publication of the Riau City Government & BPBD (2026)
Number of Blackout Incident Points	196 incident points	Spread across 14 sub-districts (field team handling notes)
Area of Burned Land (Riau Province)	20,597.23 ha	Recapitulation of the Riau Province BPBD as of September 27, 2026
New Hotspot Status (Pekanbaru)	Nil (as of October 6, 2026)	Statement of the Pekanbaru City BPBD (2026a)
Air Quality (ISPU Peak)	Had reached >200 (Very Unhealthy)	Pekanbaru City Government Release (September 21 & October 6, 2026)

Source: Synthesis of secondary data from Pekanbaru City Government, Riau BPBD, and BMKG (2026).

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Table 1 confirms that forest and land fire indicator analysis requires careful definitional separation: the incident points for physical action in the field differ from the hotspots detected by satellite monitoring. Furthermore, even if Pekanbaru's fire status is declared zero on a given date, a dense haze crisis can still blanket the city due to wind movement carrying smoke from neighboring districts and provinces.

1.2 Dynamics of Haze, Air Quality, and Public Health

Exposure to particulate matter (PM_{2.5}) pollutants during the forest and land fire disaster triggered a serious health crisis that directly impacted people's work capacity. The official release of the Pekanbaru City Health Office noted that during the period of August 24 to September 21, 2026, a total of 6,622 residents were registered as experiencing health problems due to smoke, with 5,820 of these cases being Acute Respiratory Tract Infections / ISPA (Pekanbaru City Government, 2026c). Even CNA Indonesia (2026a) reported that the accumulation of residents affected by health exceeded 10,000 people in early October 2026.

Illness in outdoor workers is a direct cost channel that interrupts effective work hours. Informal workers suffering from acute respiratory infections face a double dilemma: they lose their daily income and must also spend additional funds on medical treatment and personal protective equipment (N95 masks).

1.3 Analysis of the Economic Impact on Street Vendors (PKL) and Culinary MSMEs

Street vendors (PKL) and open-air culinary micro-enterprises are the groups most vulnerable to the decline in community mobility. The cessation of face-to-face activities in Pekanbaru schools and the implementation of distance learning until mid-October 2026 (CNA Indonesia, 2026a) have cut off the main customer chain for street vendors around educational areas. Pekanbaru TV (2026) documented an empirical picture of street vendors: Experience of Decline: Irwan, a street vendor in Pekanbaru, reported an estimated 30% decrease in daily income due to the lack of customers leaving the house and being forced to cut sales hours.

Resilient Experience: Ari Santoso, a trader at a separate location, stated that his daily sales turnover is relatively stable due to the support of regular customers and a protected location. As a regional comparison, reports in Palangka Raya and Sumatra recorded complaints from small traders who experienced a decline in turnover of 50%–80% (Ariefana/Suara.com, 2026; Zona Satu News, 2026). This variation shows that the magnitude of the decline in turnover is strongly influenced by the elasticity of merchandise, business location, and the level of reliance on pedestrians.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

1.4 Impact Analysis on the Informal Transportation Sector and Online Motorcycle Taxis

The informal transportation sector, particularly conventional motorcycle taxi drivers and app-based (online) motorcycle taxi drivers, is experiencing a shift in daily demand patterns. The decline in public passenger travel due to distance learning (PJJ) and stay-at-home orders has drastically reduced passenger delivery orders.

As reported by Ariefana/BBC News Indonesia (2026), Imrayedi (63 years old), an online motorcycle taxi driver in Pekanbaru, said that he was forced to continue driving in the thick haze despite experiencing shortness of breath and dizziness, in order to cover his family's living expenses.

Initial assumptions that increased food delivery services would fully offset the decline in passenger orders have not always been borne out. Many drivers reported that total daily orders continued to decline in aggregate as people curbed non-essential consumption. Furthermore, motorcycle taxi drivers have had to cover increased daily operating costs for personal healthcare.

1.5 Analysis of Productivity, Social Mobility, and Macroeconomic Losses

In aggregate, the impact of the forest and land fire crisis on regional economies and the informal sector can be mapped through loss estimates from various research institutions. Reports on changes in informal workers' income, synthesized by mass media, are summarized in Table 2.

Table 2. Summary of Report on Changes in Informal Sector Income During Forest and Land Fires in 2026

Worker Group & Location	Form of Change in Income / Turnover	Media Information Sources	Data Notes & Limitations
Culinary Street Vendor (Pekanbaru)	Daily revenue worsens down ~30%	Pekanbaru TV (August 24, 2026)	The case of a sole trader (Irwan); location variations
Small Traders (Pekanbaru)	Daily turnover is relatively stable / not decreasing	Pekanbaru TV (August 24, 2026)	The case of a sole trader (Ari); regular customers

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Worker Group & Location	Form of Change in Income / Turnover	Media Information Sources	Data Notes & Limitations
Ojol Driver (Central Kalimantan)	Daily turnover drops by 50% – 60%	iNews / RCTI+ (Oct 20, 2026)	Regional comparison (not Pekanbaru)
Soto Trader (Palangka Raya)	Turnover from millions to Rp. 200,000–Rp. 500,000	Suara.com / Ariefana (2026)	Open culinary regional comparison
Claims of the National MSME Association	Turnover decline ranges from 50% – 80%	Zona Satu News (Oct 29, 2026)	Association claim estimate (APKLI)

Source: Verified media news synthesis (2026).

Meanwhile, the projected macro loss calculations from various economic institutions are presented in Table 3.

Table 3. Estimated Economic Losses from Forest and Land Fires from Various Research Sources

Loss Indicators & Parameters	Estimated Loss Value	Source & Calculation Method
Losses from the 2019 Forest and Land Fire Disaster	US$5.2 Billion (~0.5% of National GDP)	World Bank (2019) — National macro evaluation
Loss of Assets & Economic Activity 2026	Rp29.54 trillion	CELIOS (2026) — National estimates Jan–August
Special Economic Loss Costs for Riau	Rp2.59 trillion	CELIOS (2026) — Portion of Riau Province (GoodStats)

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Total Economic & Health Impact 2026	Rp39.29 trillion to Rp123.1 trillion	CELIOS (2026) — Inclusive projection of medical costs
Extrapolation of Forest and Land Fire Losses in 2026	Rp167 Trillion (Range Rp136–234 T)	Teguh Yudo Wicaksono / UIII (Kompas.com, 2026a)

Source: Synthesis of World Bank, CELIOS, and UIII reports (2026).

Table 3 shows that Riau's aggregate losses reached Rp2.59 trillion. Although informal sector losses are not yet accounted for separately in official GRDP statistics, the decline in street vendor and MSME turnover contributed significantly to the contraction in regional household consumption.

1.6 Policy Implications and Handling Strategies

In order to mitigate the economic downturn of informal sector actors during the recurring forest and land fire crisis in Pekanbaru, integrated strategic steps are needed:

Relaxation and Restructuring of MSME Credit: As encouraged by economic observers and trader associations (Kontan, 2026; Periskop.id, 2026), the Financial Services Authority (OJK) and banks need to implement a postponement of installment payments for MSMEs affected by natural/ecological disasters.

Direct Cash Assistance (BLT) Scheme for Ecological Disasters: Local governments need to prepare emergency social safety net funds for informal outdoor workers who have lost income due to the thick smoke crisis.

Provision of Free Health Protection Posts and PPE: Distribution of free N95 masks and provision of air-conditioned/air-purifying rest rooms in PKL concentration centers and motorcycle taxi bases to maintain workers' physical productivity.

Micro-Business Digitalization: Facilitating digital inclusion training so that street vendors and traditional culinary MSMEs can connect to online ordering platforms when pedestrian mobility is halted.

CONCLUSION

Based on a comprehensive literature review and secondary data analysis, this study concludes that the forest and land fires and haze disasters in Pekanbaru City throughout 2026 had a significant negative impact on the economic stability of the informal sector. Exposure to dense haze with an ISPU rating of Very Unhealthy reduced residents' mobility, halted face-to-face learning activities in schools, and disrupted effective working hours. This condition caused a decline in daily turnover for street

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

vendors and culinary MSMEs of between 30% and 80% in business units that rely heavily on direct consumers. Motorcycle taxi drivers and informal transportation also experienced a decline in income due to the decline in daily passenger travel. Although the macro losses for Riau Province are estimated at IDR 2.59 trillion, the impact at the micro level is asymmetrical and highly dependent on location, type of business, and the digital adaptability of business actors.

REFERENCE

Ministry of Environment and Forestry. (2022). Indonesia's environmental status 2022. Ministry of Environment and Forestry of the Republic of Indonesia.

Meteorology, Climatology, and Geophysics Agency (BMKG). (2026, September 10). Indonesia's weather forecast for the week of September 11–17, 2026: Haze persists amidst the dry season, remain alert for the possibility of local rain in some areas. BMKG.

World Bank. (2019, December). Indonesia economic quarterly: Investing in people. The World Bank Group.

ANTARA News. (2026, October 16). Smog blankets Pekanbaru, leaving air quality hazardous. ANTARA News Agency.

Awaluddin. (2016). Public health complaints due to haze from forest and land fires in Pekanbaru City. Endurance Journal: Scientific Study of Health Problems, 1(1). https://doi.org/10.22216/jen.v1i1.936

BBC News Indonesia. (2026, October 11). Forest and land fires: Income of MSMEs and motorcycle taxi drivers plummets amid the haze. BBC News.

Efendi, F., & Suyanto. (2022). Public opinion of Pekanbaru City regarding the haze from forest and land fires in Riau Province in 2019. Student Online Journal (JOM) in the Field of Social and Political Sciences, 9(1).

Scientific Journal of Science and Technology. (2024). The effects of forest fires on the environment. Scientica: Scientific Journal of Science and Technology.

Listari, J., Sudira, P., Ananda, R., Saputra, RF, & Fatmawati. (2024). The effects of forest fires on the environment and natural resources in Pekanbaru. Scientica: Scientific Journal of Science and Technology, 3(1), 658–671.

Muksin. (2006). The impacts of the smoke haze pollution on urban environment: A case of Pekanbaru City, Riau Province, Indonesia [master's thesis, Gadjah Mada University]. ETD Repository, Gadjah Mada University.

Pekanbaru TV. (2026, August 24). Pekanbaru haze erodes street vendors' income by up to 30 percent. Pekanbaru TV.

Sihotang, SM (2026, August 26). Haze from Riau's forest and land fires suppresses consumption and income of MSMEs. Bisnis.com.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Suryani, AS (2012). Handling haze caused by forest fires in Indonesia's border areas. Aspirasi: Journal of Social Issues, 3(1), 59–75.

Zahtamal, Z., Restila, R., Suyanto, S., & Nazriati, E. (2023). Correlation between the distribution of hotspots and air quality in Pekanbaru City. PREPOTIF: Journal of Public Health, 7(1), 283–291. https://doi.org/10.31004/prepotif.v7i1.6888

Ariefana, P. (2026, October 14). The suffering of online motorcycle taxi drivers in the Kalimantan forest fires: Shortness of breath and headaches but must work. Suara.com.

BCA Securities. (2026, August 24). Pekanbaru Airport remains operating normally despite the haze [IQPlus Quote]. BCA Securities.

CNA Indonesia. (2026a). Haze surrounds Pekanbaru: Schools study from home, visibility down to 800 meters. CNA Indonesia.

CNA Indonesia. (2026b). “We can only wait and hope”: Haze from forest and land fires disrupts the livelihoods of residents in Sumatra. CNA Indonesia.

GoodStats. (2026). 5 provinces with the greatest potential economic losses due to forest and land fires in 2026. GoodStats Data.

iNews. (2026, October 20). 450,000 Central Kalimantan residents affected by haze from forest and land fires, provincial government distributes aid. RCTI+.

Kompas.com. (2026a, October 17). Economic losses due to forest and land fires in 2026 are estimated to reach Rp 167 trillion. Kompas.com.

Kompas.com. (2026b, October 18). Economists estimate losses from forest and land fires could reach Rp 204 trillion, recommending the government address this. Kompas.com.

Kontan. (2026, October 19). Forest and land fires threaten MSME businesses, government urged to provide credit relaxation. Kontan Industri.

Kumparan. (2026). Forest and land fires 2026, public bill: Who bears the cost of producers' profits? Kumparan.

Metro TV. (2026, October 23). Affected by the haze, getek drivers on the Musi River are short of passengers. Metro TV News.

Periskop.id. (2026, October 31). OJK urged to immediately restructure MSME loans affected by natural disasters. Periskop.id Banking.

Zona Satu News. (2026, October 29). MSME turnover plummets 50–80% due to forest and land fires, APKLI Merah Putih Chairman urges Prabowo to provide direct cash assistance and financial stimulus. Zona Satu News.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.