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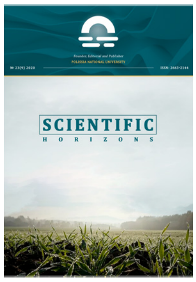

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Assessment of wildfires forecast performance in Albania: Case study

Orjeta Jaupaj*
Doctor of Sciences, Researcher
Polytechnic University of Tirana
1024, 60 Don Bosko Str., Tirana, Albania
https://orcid.org/0000-0002-0175-5005
Alban Doko
PhD, Researcher
Polytechnic University of Tirana
1024, 60 Don Bosko Str., Tirana, Albania
https://orcid.org/0009-0006-4079-0125
Ardit Dervishi
Researcher
Polytechnic University of Tirana
1024, 60 Don Bosko Str., Tirana, Albania
https://orcid.org/0009-0002-4679-6019
Florinda Kadria
Master of Sciences, Technician
Polytechnic University of Tirana
1024, 60 Don Bosko Str., Tirana, Albania
https://orcid.org/0009-0005-5597-0324
Klodian Zaimi
PhD, Researcher
Polytechnic University of Tirana
1024, 60 Don Bosko Str., Tirana, Albania
https://orcid.org/0000-0003-0495-586X

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Abstract. The harmful impacts of climate change caused by wildfires are substantially harming the people of mainland Europe, as well as damaging species biodiversity and the ecosystem. It can be minimised by improving the effectiveness of fire risk forecasting and mitigation strategies. The aim of this paper was to investigate the accuracy of forest fire forecasts in Albania produced by the FWI (Fire Weather Index) system. During the summer of 2022, observations and data were collected on expected and actual fires in the prefectures of Albania, which were previously divided into four

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*Corresponding author

categories according to the level of fire risk: high, moderate, low, and zero. It was determined that, in the summer of 2022, Albania happened a grand total of 620 wildfires. The data were analysed using two indicators: the probability of fire occurrence for a particular prefecture and the number of fires per prefecture. The analysis revealed varying degrees of accuracy in fire predictions across different prefectures, with higher precision observed in high-risk regions but diminishing as the risk level decreased. The most dependable indicator of forecast accuracy, reaching 75%, was observed in high-risk areas during the month of August. Predicting fire localization within moderate-risk zones consistently achieved results above 50% but fell short of the 60% threshold. Overall, the results confirm the effectiveness of using data to predict the probability of fires for prefectures with a high and increased level of the relevant threat. This will make it possible to more effectively deploy and mobilise the resources needed to overcome them and substantially reduce the losses associated with them

Keywords: fire prevention; predicting fires in forested areas; natural hazards; risk assessment; Albanian forests

INTRODUCTION

Wildfires, often fueled by dry conditions, high temperatures, and flammable vegetation, can unleash destructive and uncontrollable forces that devastate landscapes and endanger lives. The frequent occurrence of natural forest fires in Europe and around the world leads to many adverse consequences for the environment and the population of the country's most often affected by this problem. Studying the ability to predict the possibility of localization, as well as the period and scale of fire occurrence is relevant, because it allows you to assess the need for evacuation, as well as to mobilize the necessary resources in time to overcome the fire and minimize possible consequences.

Albanian scientists E. Muça *et al.* (2022) determined that gas emissions from the combustion of high-carbon biomass not only increase the greenhouse effect and, in the long term, can substantially affect the composition of the atmosphere, but also reduce the number of plants that contribute to the conversion of carbon dioxide and the transfer of carbon into a form accessible to living organisms, playing an important role in its transformation. O. Jaupaj *et al.* (2023) conducted a survey of forecast warnings and fire events in the summer seasons for 2017-2021 in Albania. Scientists have confirmed that gas emissions affect the condition of soils and soil microbiota, which also takes an active part in the transformation of elements. The increase in the greenhouse effect and global warming trends only increase the probability of fires. Massive fires also pose a threat to the lives, health, and property of people living nearby and have a negative impact on their well-being which also increases the relevance of the research.

L.M. Johnston *et al.* (2020), in their work on defining the prerequisites for fire prediction, identify the following main components of natural fires: probability, which includes fire behaviour and the possibility of its occurrence in a particular place, impacts and consequences, and contact. Based on these key points, as well as on the array of data collected on fires that have already occurred, it appears possible to see the preconditions for a natural fire in the future.

Currently, there are two global European databases that collect the works of most researchers and the content of the archives of numerous research centres in different countries – the Global Fire Monitoring Centre (UNDRR, 2017) and the European Forest Fire Information System (EFFIS) (European Commission, 2023).

S. Sudhakar *et al.* (2020) were among the first to reach the next stage – the creation of a specific index for characterising fires. They used data from unmanned aerial vehicles (UAVs) to calculate the Fire Detection Index (FDI) and the Forest Fire Detection Index (FFDI). However, the most commonly used is the Canadian Fire Weather Index (FWI) by C.E. van Wagner and T.L. Pickett (Archibald *et al.*, 2018), developed within the framework of the Canadian Forest Fire Detection and Rating System (CFFDRS). For European conditions, this index is adapted by EFFIS, and for Albania, since 2016, is being used by the Institute of Geosciences (IGEO) (n.d.). The actual work on the study of fires in the country is carried out by a subdivision of this institute – the Centre for Forecasting and Monitoring of Natural Hazards (CFMNH) (Jaupaj & Zaimi, 2021). Despite the diversity of methods explored in the listed works for fire prediction, it is evident that a unified and comprehensive methodology is crucial for effectively forecasting not only the onset and progression of fires but also their potential consequences.

Thus, the purpose of this paper was to establish the degree of reliability of the forecasts obtained using the FWI system for prefectures of Albania with different levels of fire risk according to the CFMNH classification.

MATERIALS AND METHODS

To determine the factual reliability of the fire weather index (FWI), were assessed the correspondence between the real frequency of fires in the territory of certain prefectures of Albania and the risk levels obtained from the FWI. Observations of the fact and location of fires were recorded every day throughout the summer of 2022 by the National Civil Protection Agency (NCPA), whose data was used during the study. The data were further processed in three main periods: July and August, as months of increased risk, and the entire summer. The results of the observations were compared with FWI data obtained by getting EFFIS and distributed in 4 categories of Risk. The information was posted on the center's website in the open access format "today for tomorrow", i.e., one day in advance (European Commission, n.d.).

Depending on the probability of fires occurring and their real occurrence, prefectures were assigned to high, moderate, low, and no risk zones, and the assessment was conducted within these zones by analysing two main factors: the coincidence of the expected and real number of fires within the risk level and the ratio of the number of fires per coincidence.

Thus, the first factor was expressed through the probability of fires in the prefecture (PHP). This indicator was calculated using the following formula (Formula 1):

$$PHP_{Level} = \sum_{i=0}^{n} \frac{n^0 Hits}{n^0 Alerts} \text{ x } 100\% , \quad (1)$$

where, PHP – is the probability of fires for the prefecture; n^0 of HITs – is the number of prefectures where fires occurred in the risk group under consideration; n^0 of Alerts – is the number of fire forecasts for a given risk level.

The second equally important factor under study was the average number of fires per prefecture (AFH). This indicator was defined as the ratio of the number of fire observations to the number of prefectures and was calculated separately for prefectures of each risk level. To simplify the assessment, the data were categorised into P_{C1} and P_{C2} (category 1 and category 2 performance) for PHP and AFH respectively and interpreted qualitatively in the format "very good", "good", and "bad", according to the template (Table 1).

Table 1. *Thresholds of PHP and AFH used for categorising the wildfire forecast Performance-Component 1 & 2*

			PHP			
	P_{C1}	PHP, %	P_{C1}	PHP, %	P_{C1}	PHP, %
High risk	VERY GOOD	70-100	GOOD	50-70	BAD	>50
Moderate risk		50-70		40-50 70-80		>40 <80
Low risk		20-40		10-20 40-50		>10 <50
Very low risk		0-10		10-20		<20
			AFH			
	P_{C2}	AFH	P_{C2}	AFH	P_{C2}	AFH
High risk	VERY GOOD	<1.5	GOOD	1.01-1.5	BAD	1
Moderate risk		1.2-1.5		1.5-1.8 1-1.2		<1.8
Low risk		1.02-1.2		1.2-1.5 1-1.2		<1.5
Very Low risk		1-1.02		1.02-1.16		<1.16

Source: *compiled by the authors based on O.E. Jaupaj and K. Zaimi (2021)*

The final fire forecasting performance (P) was determined based on the obtained indicators and evaluated on a scale from 1 to 5, according to the scheme (Table 2). All indicators were evaluated for the entire summer, as well as separately for July and August.

Table 2. *Categorising the wildfire forecast performance-final evaluation*

	P_{C1}	P_{C2}	P_{C1}	P_{C2}	P_{C1}	P_{C2}	P_{C1}	P_{C2}	P_{C1}	P_{C2}
Final evaluation	VG	VG	G VG	VG G	G	G	B G	G B	B	B
	1		2		3		4		5	

Source: *compiled by the authors*

RESULTS

To begin with, it's essential to discern the distinctions between the IGEO and EFFIS classifications, as well as the units used to measure fire intensity. This differentiation is visually presented in Table 3.

***Table 3**. IGEO vs. EFFIS fire danger classes*

Fire danger classes	FWI ranges	
	EFFIS	IGEO/CFMNH
No risk		<5.2
Very low	<5.2	-
Low	5.2-11.2	5.2-11.2
Moderate	11.2-21.3	11.2-38.0
High	21.3-38.0	>=38.0
Very high	38.0-50.0	-
Extreme	>=50.0	-

***Source:** compiled by the authors based on O.E. Jaupaj and K. Zaimi (2021)*

EFFIS identifies 6 levels of risk, while IGEO has only four, the ranges of which coincide with the corresponding levels in the EFFIS classification. So, in general, the difference is that the European system distinguishes two more levels of "very high" and "extreme" danger, which are not distinguished by the Institute of Sciences of Albania. The assessment of the possibility of predicting the risk of fire occurrence in Albania using FWI methods included the collection of two types of data: real fire occurrences and fire forecasts in the respective prefectures. In July, 305 fires broke out across the country. They were most often recorded in moderate-risk prefectures – in 61.3% of cases. High-risk prefectures accounted for 37.7% of the total number of fires, and less than 1% of fires occurred in low- and zero-risk prefectures (Table 4).

***Table 4.** Data on forecast alerts, fire occurrence and HITS by risk levels, 2022*

	July	August	Summer
FA_{High}	74	55	129
FO_{High}	115	90	205
Hits	50	41	91
$FA_{Moderate}$	206	139	345
$FO_{Moderate}$	187	166	353
Hits	106	82	188
FA_{Low}	14	68	82
FO_{Low}	2	40	42
Hits	2	23	25
FA_{No}	18	86	104
FO_{No}	1	19	20
Hits	1	15	16
FA_{Total}	312	348	660
FO_{Total}	305	315	620

***Source:** compiled by the authors*

The forecasts for this period showed a slightly different picture: 312 forecast warnings predicted that 23.7% of the probable fire occurrences would occur in high-risk areas, and 4.5% and 5.5% in low- and no-risk prefectures. The forecast for the number of fires in moderate risk prefectures was close to reality – 66%. Almost the same total number of fires occurred in August – 315 recorded incidents. Between different risk levels, the ratio of fires was as follows: 28.6% in high-risk prefectures, 52.7% in moderate-risk areas, 12.7% in low-risk areas, and 6% of the total number of fires occurred in prefectures with no risk. Therewith, 348 alerts about possible fires were recorded. Forecasts for high-risk, moderate-risk, and low-risk prefectures were close to reality – 25.8%, 47.7%, and 11.5%, respectively. As in the previous month, the number of real fires in areas of no risk was considerably lower than the estimated 15% (Table 4).

A total of 620 fires were recorded in Albania during the summer of 2022. Of these, the prefectures in the moderate risk zone accounted for the largest share

(56.9%), while in the high-risk zone the figure was 31.1%, and the lowest number of fires was observed in the prefectures in the low and no risk zones – 6.7% and 3.3%, respectively. The corresponding data obtained as a result of the daily collection of forecasts regarding the risk of fire occurrence in the territories of individual risk zones correlate well with the real map of fires in the prefectures of the moderate risk zone – 52.3% of the predicted probability compared to 56.9% – the proportion of recorded fires in this zone from all that occurred in all zones during the summer. Fires in the high-risk zone really occurred more often than expected, accounting for 19.6% of the total. It was also assumed that fires would occur more frequently in low and zero-risk areas, accounting for 12.4% and 15.7% of the total. The predicted (FA) and real (FO) quantitative distribution of fires in prefectures of different hazard levels is presented in the graph (Fig. 1).

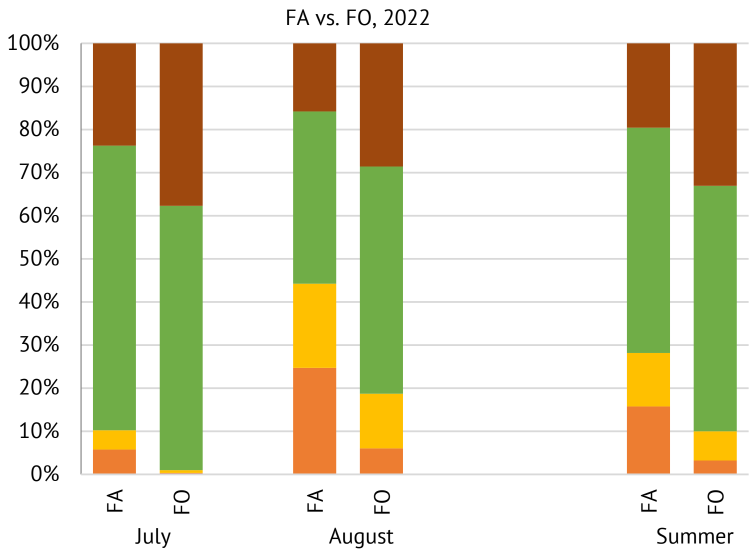

Figure 1*. The distribution of Forecast Alerts (FA) and Fire Occurrence (FO) by risk levels*
Source: *compiled by the authors*

It shows that the percentage of fires that occurred in moderate-risk prefectures was predicted quite accurately both in the context of individual months and for the entire season. The largest difference between the predicted and real situation in all cases concerned the prefectures with no-risk. Therewith, predictions of fire occurrence in particular prefectures were more accurate for prefectures in high-risk areas, worse for moderate-risk prefectures, and very poor for low- and no-risk prefectures (Fig. 2).

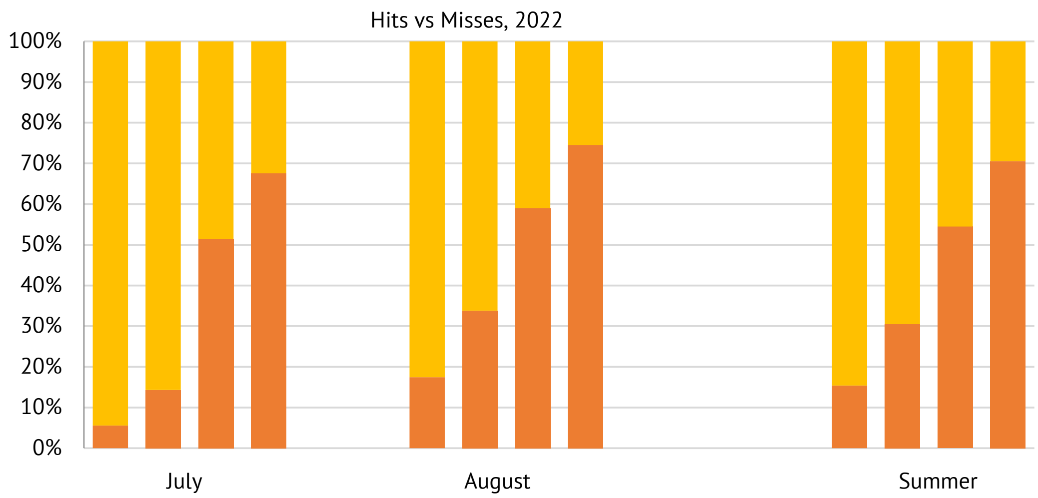

Figure 2*. The distribution of Hits and Misses by risk levels*
Source: *compiled by the authors*

The hit rates of the latter did not exceed 34%, 30%, or even 20%. The best indicator of forecast accuracy and fire occurrence in specific locations was 75% for high-risk areas in August. This high result could also be explained by the relatively small number of risk areas of this type. Predicting fire localisation within moderate hazard zones gave stable results, which, although exceeding 50%, did not reach 60%. However, apart from the ratio of correct to incorrect predictions, it is also worth considering that during the observation period, especially in higher risk areas, more fires almost always occurred than predicted, and therefore the ratio between the predicted and real number of fires differs for these prefectures (Table 5). Thus, for high-risk prefectures, about 45% of fires were predicted for each of the time periods under study, and for moderate risk prefectures, from 49% to 53%. In the case of low- and zero-risk areas, the percentage of predicted fires ranged from 57% to 100% and 79% to 100%, respectively.

The average frequency of prefectural fires (AFH) was highest for high-risk prefectures, with approximately two or more per prefecture, with no statistically significant difference between the periods under study. In moderate-risk prefectures, 1-2 fires occurred during the monitoring period, with a slightly higher frequency in August. In July, approximately the same number of fires – one or none – were observed in low and no probability prefectures, while in August, as in the entire summer period, these figures were slightly higher for no probability prefectures and higher for low probability areas (Fig. 3).

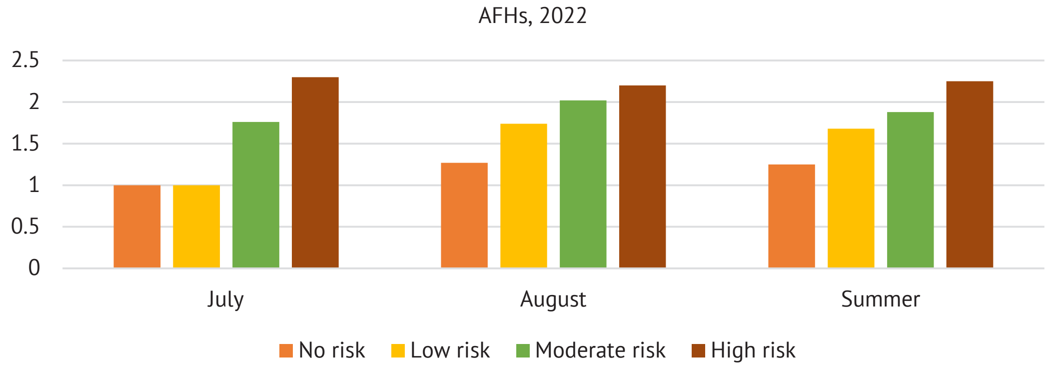

Figure 3. *The distribution of Average Fires per Hits by risk levels*

The prefectural fire probability assessment for July was most effective for moderate risk prefectures, and, like the number of fires per prefecture, reached the "very good" level. In addition, both indicators for the absence of risk were rated "very good". For high-risk prefectures, the result was worse – the first indicator reached only 68%, which corresponds to the "good" mark for this level of danger. Therewith, the second indicator was rated as "very good". The low-risk prefectures performed even worse: both indicators reached the "good" level, as they were too low (28% and 1.0) to reach the "very good" level. The final performance of the forecasts made in July was assessed as: "2" or "good", although the PHP values were above the "very good" threshold for two risk levels – moderate and no risk – and the AFH values reached this threshold for two risk levels – high and no risk. In general, all levels had different scores in both components, which allowed them to take certain places in the ranking as follows: $P_{high\ risk}$"2", $P_{moderate\ risk}$→"2", $P_{low\ risk}$→"3", $P_{no\ risk}$→"1", according to the data obtained (Table 4).

Table 5. *Wildfire Forecast Performance on a monthly duration basis and season duration basis PATH 2 raw data, PHP, AFH, 2022*

	July						August						Summer					
	PHP, %	AFH	P_{C1}		P_{C2}	P_F	PHP, %	AFH	P_{PHP}		P_{AFH}	P	PHP, %	AFH	P_{PHP}		P_{AFH}	P
High risk	68	2.30	G	Low PHP	VG	2	75	2.2	VG		VG	1	71	2.25	VG		VG	1
Moderate risk	51	1.8	VG		G	2	5%	2.0	VG		√++	2	51	1.9	VG		√++	2
Low risk	14	1.0	G	Low PHP	√-	3	34	1.7	VG		√++	2	28	1.7	VG		√+	2
No risk	6	1.0	VG		VG	1	17	1.3	G	High PHP	√++	3	14	1.3	G	High PHP	√+	3

Source: *compiled by the author of this study*

The effectiveness of risk assessment in August was somewhat lower overall, due to the unsatisfactory results of the assessment of the number of fires per prefecture. In turn, the prefectural fire probability score was slightly better, with three prefectures in the high, moderate, and low hazard levels achieving a "very good" rating, up from two in July. Therewith, the forecasting efficiency for the zero-risk group dropped to "good", with a result of 17%, which is too high for this level of danger. AFH values stayed at the "very good" level for high-risk prefectures, but were too high for moderate, low, and zero risk (2.0, 1.7, and 1.3, respectively) and scored "BAD" on the rating scale, which is significantly worse than the previous month.

Fulfilment of forecasts for August, due to improved PHP results, eventually reached the mark of "2", which corresponds to a "good" rating. Forecasts for high-risk prefectures have become more effective, with the "good" rating changing to "very good", and the forecasts for low-risk prefectures improving from "bad" to "good". The performance of moderate-risk prefectures stayed generally unchanged, while the performance of zero-risk prefectures deteriorated from "good" to "bad". The rating of forecasts for different risk levels in August was as follows: $P_{high\ risk}$"1", $P_{moderate\ risk}$→"2", $P_{low\ risk}$→"2", $P_{zero\ risk}$→"3".

Overall, during the summer of 2022, the forecasts for the high-risk prefectures were rated as "very good" for both indicators. For moderate-risk prefectures, the first component was also at the "very good" level, while the second exceeded the values allowed for a positive assessment and stopped at the "bad" level. The situation was similar for the low-risk prefectures, with PHP receiving a "very good" rating and AFH receiving a "bad" rating. The lowest level of PHP for the season was characterised by zero risk level, along with a rating "bad" for the second indicator. For the entire summer season, the predictions were fulfilled for prefectures with different levels of wildfire risk as follows: $P_{high\ risk}$ "1", $P_{moderate\ risk}$→ "2", $P_{low\ risk}$→ "2", $P_{zero\ risk}$→ "3", with the final score being "2" – "good". These figures are closer to those obtained in August, but the actual results for the season on average were slightly better, albeit within the respective levels and without any shifts to higher or lower efficiency ratings. There is also a slight correlation between the total number of predictions made in a month and the number of hits, but the number of misses is also increasing.

DISCUSSION

The probability of wildfires is a pressing issue in Europe and globally, especially during periods of heightened danger, during which historically more incidents have occurred in the respective regions. In this context, the problem of fire prediction is quite acute and consists of two main components: monitoring their actual occurrence and recording the facts of risk, and the development and use of algorithms for predicting the probability of fires in a particular area. The next step is to prepare both direct firefighting measures and the relevant infrastructure, and to work with the public. EFFIS currently has 40 member countries, which includes almost all European countries, regardless of their affiliation with other international organisations (European Commission, n.d.). However, only 22 countries have been part of the so-called "common core" since 2004, which is engaged in continuous monitoring of the fire situation and collecting relevant data for comparison in the community (European Fire Database, n.d.).

This study evaluated the effectiveness of fire forecasting using the FWI system for prefectures of four risk levels on a scale from "bad" to "very good", with a final score of 1 to 5. Thus, the prefectures in the no-risk zone in July and the high-risk zone in August and for the whole summer received "very good". However, the forecasting results in the no-risk zone were not very good, due to the AFH component. In previous years of analogous surveys, the results were quite comparable. In 2020, the observations for July and August resulted in "very good" for high-risk prefectures in July and August (no data for June), and a similar result for zero-risk areas in June and July (Jaupaj *et al.*, 2023). In 2017, the "very good" observation result was obtained for prefectures in high-risk and no-risk areas in June, and for high-risk areas in July and August (Jaupaj & Zaimi, 2021). All other territories received marks of "good" and "bad" in a roughly even distribution across months and years.

Presumably, forecasting in these areas turned out to be the easiest for several reasons. In the high-risk zone, the frequency of fires was very high in all months, as was the number of fires per prefecture of the corresponding risk level, and therefore, apart from the pronounced risk factors that allowed for more comprehensive assumptions, the statistical probability of a hit was also higher, but this could not affect the final result in the zone of statistical significance. In turn, for prefectures with no-risk of fire, 4-11 times more predictions were made than real fires. This has increased the hit rate, but this approach, especially in the context of prefectures with more hazardous situations, could potentially put added strain on the firefighting system in general or on certain days.

According to M.M. Müller *et al.* (2013), in Austria, local fires are often smaller than 30 ha, and therefore their detection is not satisfactory with the accuracy of EFFIS. Similar to Albania, the country uses adapted Canadian indices and conducts fire forecasting based on its own national forecasting centre, which stores data for the last 25 years. A study by R. Zotta *et al.* (2023) estimated the efficiency of using FWI in Austria at 68%, but when integrating other information levels, such as socio-economic parameters, vegetation parameters, etc., the forecasting accuracy increased to 87%. These results are comparable to the "good" assessment obtained in this study, but do not include assessments of individual risk groups for territories. A. Depicker *et al.* (2020) describe the approach of the National Fire Forecasting Centre of Belgium, which has been intensively involved in updating and improving cartography since 2013. Even though spontaneous fires are not a top priority in this country, fire forecasting is based on extensive data on the structure and distribution of wood, soil, land use history, etc., and the territory is divided according to the expected level of risk. These results are consistent with research I. Vallejo-Villalta *et al.* (2019).

The study by J. Bedia *et al.* (2018) on the prospects for the adaptation and use of the FWI index in the Mediterranean countries showed mixed results. The first part of the study was an analogous approach to the one used herein, namely comparing predictions and real observations of fire occurrence. This resulted in "good" and "above average" predictive scores for some countries, such as Turkey, Greece, and Bulgaria, and partially for France, and Central Spain. The use of two correction methods slightly increased the probability of prediction but did not critically change the overall picture. Negative trends were observed for the southern coasts of the Adriatic and Ionian Seas. In general, the data presented by the authors correlate with those obtained in this study and strongly suggest that it is necessary to consider more variables to predict the probability of fire occurrence using the index under consideration in areas that differ climatically and in terms of vegetation and soil types from the corresponding indicators in Canada. On the other hand, the study in question assessed the effectiveness of forecasting in the longer term – on the ground, while one-day forecasts were more likely to fulfil their potential (Bedia *et al.*, 2018).

Another analogous study is related to the Mediterranean region, specifically the Iberian Peninsula and Greece. There, the use of the index was more successful, and T. Giannaros *et al.* (2021) identified the consideration of wind strength and direction and precipitation as factors of problematic aspects of indexing under this system and called temperature and humidity characteristics as compensatory aspects. These difficulties are related to the proximity of these territories to the World Ocean, which is a considerable factor in the variability of weather conditions and, accordingly, impairs the ability to predict the phenomena that are largely dependent on them (Giannaros *et al.,* 2021). The study by A. Novo *et al.* (2020) was aimed at obtaining a high-quality mapping image with zoning corresponding to the level of fire risk in Galicia, Spain. During the study, the authors came to the unequivocal conclusion that the use of automated and semi-automated methods for processing and forecasting various risk factors, and the FWI index in particular, is much more effective than forecasting with a greater share of human involvement.

Similar to Austria and Albania, Greece also introduced the FWI index. According to V. Varela *et al.* (2018) and K. Papagiannaki *et al.* (2020), it was implemented in approximately the same period – 2013, after five years of monitoring and data collection within the country, by the national observation centre. And for the effective functioning of forecasting using this index, work has been done to consider various combinations of additional factors. In general, one can observe mixed, but rather positive experiences with the FWI index in different parts of Europe, where studies have been conducted to determine its effectiveness. A general conclusion from the experience of these countries is that the use of this factor outside of Canada and areas with appropriate climate, soil and vegetation should be complemented by other indicators that are key to the region of implementation.

CONCLUSIONS

The study evaluated the factual reliability of the Fire Weather Index (FWI) and examined the correlation between the actual frequency of fires in specific prefectures of Albania and the risk levels predicted by the FWI. It was observed that fire predictions in specific prefectures exhibited higher accuracy in high-risk regions, but declined for those with moderate risk. Predictions for low and no-risk prefectures performed notably poorly, with hit rates not surpassing 34%, 30%, or even 20%. The most reliable indicator of forecast accuracy, reaching 75%, was observed for high-risk areas in August. Conversely, forecasting fire localization within moderate-risk zones yielded consistent results, consistently surpassing 50% but falling short of 60%.

It was also determined, for high-risk prefectures, approximately 45% of fires were forecasted during each of the examined time periods, while for moderate-risk prefectures, the prediction rates ranged from 49% to 53%. In contrast, for low-risk and zero-risk areas, the range of predicted fires spanned from 57% to 100% and 79% to 100%, respectively. In general, the results of using indices to predict the occurrence of fires in prefectural areas belonging to the high, moderate, low, and no risk zones are mixed, but mostly positive. It worth to say, that the forecasting accuracy in prefectures is still unstable and shows rather erratic results.

Thus, in countries such as Albania, which are at risk of many types of natural disasters and their high frequency, such studies are mandatory. The wide variety and frequency of hazards, if not properly understood and controlled, can lead to an increase in fire risk over time. The prospect of further research in this area is determined by the consistently high risks of forest fires in the Mediterranean forestry sector and the associated need to investigate the possibilities of minimising these risks and implementing warning systems for the presence of such a danger. There is also a need for further research to analyse burnt forest areas in individual prefectures at all levels of fire hazard forecasting. Therewith, emphasis should be on particular losses that have been recorded according to the high-risk forecast.

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None.

CONFLICT OF INTEREST

None.

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Оцінка ефективності прогнозування лісових пожеж в Албанії: тематичне дослідження

Оржета Яупай
Доктор наук, дослідник
Політехнічний університет Тирани
1024, вул. Дон Боско, 60, м. Тирана, Албанія
https://orcid.org/0000-0002-0175-5005

Албан Доко
Кандидат наук, науковий співробітник
Політехнічний університет Тирани
1024, вул. Дона Боско, 60, м. Тирана, Албанія
https://orcid.org/0009-0006-4079-0125

Ардіт Дервіші
Науковий співробітник
Політехнічний університет Тирани
1024, вул. Дона Боско, 60, м. Тирана, Албанія
https://orcid.org/0009-0002-4679-6019

Флорінда Кадрія
Магістр наук, технік
Політехнічний університет Тирани
1024, вул. Дона Боско, 60, м. Тирана, Албанія
https://orcid.org/0009-0005-5597-0324

Клодіан Заїмі
Доктор філософії, науковий співробітник
Політехнічний університет Тирани
1024, вул. Дона Боско, 60, м. Тирана, Албанія
https://orcid.org/0000-0003-0495-586X

Анотація. Шкідливі наслідки зміни клімату, спричинені лісовими пожежами, завдають значної шкоди населенню континентальної Європи, а також завдають шкоди біорізноманіттю видів та екосистемі. Його можна мінімізувати, підвищивши ефективність прогнозування пожежних ризиків та стратегій пом›якшення їх наслідків. Метою цієї статті було дослідити точність прогнозів лісових пожеж в Албанії, зроблених за допомогою системи FWI (Індекс пожежної погоди). Протягом літа 2022 року були зібрані спостереження та дані про очікувані та фактичні пожежі в префектурах Албанії, які раніше були розділені на чотири категорії за рівнем пожежного ризику: високий, помірний, низький та нульовий. Встановлено, що влітку 2022 року в Албанії загалом сталося 620 лісових пожеж. Дані аналізувалися за двома показниками: ймовірність виникнення пожежі для конкретної префектури та кількість пожеж на префектуру. Аналіз виявив різний ступінь точності прогнозів пожеж у різних префектурах, причому вища точність спостерігалася в регіонах з високим ризиком, але зменшувалася зі зниженням рівня ризику. Найбільш достовірний показник точності прогнозу, сягаючи 75 %, спостерігався в зонах підвищеного ризику протягом серпня місяця. Прогнозування локалізації пожежі в зонах помірного ризику постійно досягало результатів вище 50 %, але не досягло порогу в 60 %. У цілому результати підтверджують ефективність використання даних для прогнозування ймовірності виникнення пожеж для префектур з високим та підвищеним рівнем відповідної загрози. Це дозволить більш ефективно розгортати та мобілізувати ресурси, необхідні для їх подолання, та суттєво зменшити втрати, пов'язані з ними

Ключові слова: запобігання пожежам; прогнозування пожеж у лісових масивах; природні загрози; оцінка ризиків; ліси Албанії