Spatial-Planning Disorder and the Ecological Disasters It Causes



Download the full article

Recurring floods, landslides, forest and land fires, and pollution are ecological warning signals for spatial planning. Land use that disregards environmental considerations represents a failure to uphold—and a departure from—the mandate of spatial-planning legislation.

> "Spatial planning aims to create a national territory that is safe, comfortable, productive and sustainable, based on the Archipelagic Outlook and National Resilience" (Law No. 26 of 2007).

In practice, spatial planning continues to suffer systemic violations that undermine sustainability. Planning instruments intended to control development are instead beset by continual compromises over investment, permits and concession interests.

West Kalimantan's planning failures remain visible in a range of problems with direct, multidimensional consequences across everyday life.

1. Massive Expansion of Oil-Palm Plantations and Mining

West Kalimantan has a recorded 370 oil-palm plantation business permits (IUP) and hundreds of mining-company permits. These figures exclude undocumented, unlicensed concessions. The resulting ecological pressure threatens sustainable land use, especially where development controls are poorly enforced.

Large-scale conversion to oil palm also creates dependence on this commodity at the expense of other plantation crops. Rahmania et al. (2026) identify West Kalimantan as one of Indonesia's regions with the highest levels of oil-palm land conflict, frequently involving corporate land grabbing supported by central or regional government policy. Natural-resource exploitation has driven ecosystem degradation, air pollution and conflicts with local communities. Environmental crime has consequently become a crucial issue in modern criminal law, particularly when perpetrators are corporations with substantial capital and complex organisational structures (Dwinanda, 2026).

Violations of land-use rules within conservation areas remain common. One example is Mandor Nature Reserve in Mandor District, Landak Regency, degraded by illegal gold mining (PETI). West Kalimantan's 2024–2043 Provincial Spatial Plan designates this reserve as covering 2,995.76 hectares. Under Law No. 5 of 1990 on the Conservation of Living Natural Resources and Their Ecosystems, a nature reserve is a protected area distinguished by plants, animals and ecosystems, or particular ecosystems requiring protection and allowed to develop naturally.

Mandor Nature Reserve contains distinctive biodiversity, including Shorea, Rengas, Jelutung, Tengkawang and other ecosystems requiring conservation. Regrettably, widespread illegal gold mining has caused river shallowing, contamination and pollution. The reserve also overlaps a State Reserve Area (WPN), revealing competing interests between conservation and potential mineral-resource use.

Furthermore, centrally driven National Strategic Projects (PSN) often prioritise rapid economic growth while neglecting local circumstances and available natural resources. Presidential Regulation No. 12 of 2025 on the 2025–2029 National Medium-Term Development Plan includes West Kalimantan among national priorities for downstream palm-oil and bauxite processing. Accelerating this processing is intended to raise gross regional domestic product (GRDP), employ local workers and consider industrial readiness, investment, raw materials and environmental impacts. Yet PT KAN's bauxite-refinery project in Toba District, Sanggau Regency, employs more foreign workers. Local people are already experiencing environmental impacts, including difficulty obtaining clean water and pollution, with a potential landslide risk along riverbanks. The provincial spatial-planning regulation states that its objectives include equitable public welfare and balanced growth guided by green-economy principles.

Land allocation in West Kalimantan must therefore reconcile economic growth with environmental sustainability. A green economy should benefit every part of society, including marginalised groups. The province's many oil-palm and mining enterprises challenge these development aspirations and demand a reassessment. Have extractive-industry profits truly served public prosperity? Have stringent environmental standards, disaster-risk management and Indigenous peoples' rights been adequately accommodated?

2. Ecological Damage in the Kapuas River Basin

Politik Ekologi dan Masa Depan Kebijakan Lingkungan di Indonesia identifies extractive-industry expansion, national development policy, global capitalism and integration into world markets, and colonial legacies shaping land-control structures as crucial drivers of ecological damage (Sanusi, 2025). The principal actors controlling spatial planning are policymakers with legal and political authority. The critical condition of the Kapuas basin illustrates how intense environmental pressures on watersheds compound ecological destruction. River pollution, forest degradation and extensive conversion of green areas reveal the basin's fragility.

Extending 1,143 km from Kapuas Hulu to Kubu Raya and Pontianak, the Kapuas is Indonesia's longest river basin and a priority for restoration. Lusiana et al. (2008) found that forests in Kapuas Hulu were threatened by logging, mining and land fires, impairing the basin's hydrological functions. Utari et al. (2019) describe the conversion of peatlands in the Kapuas Terentang basin into oil-palm, rubber and ginger plantations, resulting in habitat loss for plants and wildlife. Sulaeman et al. (2024) trace peatland conversion in Permata Village, Terentang District, to the start of an oil-palm-based transmigration programme in 2012. Communities in the Mendalam basin, North Putussibau District, similarly rejected the entry of plantation company PT Kalimantan Agro Permata because Indigenous residents did not want their land and natural resources damaged. In 2021, Sugandi et al. studied the Kapuas and Landak rivers in Pontianak and identified filaments (33%) and fragments (33%) as the dominant microplastic forms. Health impacts can include brain inflammation, stress, digestive disorders, cancer, skin irritation, cardiovascular problems, and respiratory and reproductive disorders. The Kapuas suffers multidimensional damage even as it remains the lifeblood of local livelihoods.

By 2026, environmental pressure on the Kapuas basin was increasing as widespread land conversion accelerated degradation of forests and water-infiltration areas. Potential consequences include faster sedimentation, erosion, flooding and declining river-ecosystem quality. West Kalimantan Provincial Regulation No. 2 of 2018 on Integrated River Basin Management, particularly provisions concerning special-use areas such as rock-mining sites, requires soil and water conservation to reduce sedimentation and prevent landslides. Management must also retain landscape features, avoid narrowing river channels or altering flow direction, and protect rivers and their surroundings, including irrigation structures and other public facilities. It must prevent pollution and follow applicable legal procedures and requirements.

Planning failures are equally visible in urban congestion, absent public transport and shrinking green open space (RTH), which should ideally cover 30% of a city's area. Uncontrolled urban sprawl is another warning. Around Pontianak, several villages in Kubu Raya Regency have gradually become urban areas over the past ten years. Expansion erodes the agricultural and social character of peripheral villages. Uncontrolled growth that fails to meet sustainability principles threatens the integrity of these places.

Forest Loss in West Kalimantan

Global Forest Watch identifies Ketapang, Sintang, Sanggau, Landak and Kapuas Hulu as accounting for 58% of tree-cover loss in West Kalimantan between 2001 and 2025. These five regencies also have the largest oil-palm concession areas and high concentrations of extractive industries.

West Kalimantan's Statistics Indonesia (BPS) recorded 43 natural disasters during 2025—four times the number in 2010. Floods dominated, affecting almost every regency and city, followed by forest and land fires and extreme weather.

Flooding is influenced by heavy rainfall, insufficient waterbody capacity, expanding built-up areas and forest degradation (Ertian et al., 2025). Extensive forest-cover loss is a failing grade demanding attention. Forest Watch Indonesia records West Kalimantan as the province with the greatest deforestation, at 35,162 hectares—3.5 times the area of Pontianak City, which covers only 10,782 hectares.

Through a Spatial Planner's Lens

Fifty-six years ago, McHarg's *Design With Nature* (1969) anticipated that spatial growth would intensify environmental degradation, industrialisation, urbanisation and exposure to chemicals. His proposal to make ecological characteristics the basis of spatial planning remains relevant. Accounting for topography, soil types, river flows, vegetation, climate and disaster vulnerability is essential to sustainability. McHarg advocated a holistic approach addressing not only project requirements but also long-term effects on the environment and its ecosystems.

Before him, Patrick Geddes (1910), known as the father of modern town planning, was among

the first to argue that cities and their environments should develop together. His “Place, Work, Folk” principle recognises the social, economic and environmental complexity of space. As a biologist and urban planner, Geddes taught that cities must be integrated with their ecosystems to support sustainable development. Applied to West Kalimantan, his “survey before plan” approach requires policymakers to consider ecological, social and economic characteristics as a whole.

Ideally, spatial plans guide development, protect conservation areas, optimise cultivation areas and safeguard water-infiltration zones. Weak supervision, conflicts of interest and political decisions, however, jointly influence the quality of planning documents.

Preparing a regional spatial plan (RTRW) involves both technocratic and normative stages. Expert teams combine scientific methods and empirical data into technical materials: factual and analytical reports, data collection and processing, and a 20-year spatial plan. Adoption then involves drafting a regional regulation and a political process with stakeholders. If experts rely on inaccurate or irrelevant data, plans may prove ineffective or even create new problems: garbage in, garbage out. Data quality is the first essential condition for sound planning. The political process, involving many interests, can then change a plan's substance while limiting public participation. Zones experts originally recommend for protection may be redesignated when confronted with economic value. Legal and political legitimation ultimately determine the final, legally binding document. Ensuring every stage of RTRW preparation functions properly is therefore part of the struggle for sustainability.

The disputes over land use in West Kalimantan today demonstrate the importance of high-quality spatial plans, sustained oversight and equitable law enforcement.

References

Dwinanda, D. P. (2026). Pertanggungjawaban pidana korporasi dalam kejahatan lingkungan industri ekstraktif di Indonesia: Antara norma dan implementasi dalam perspektif green criminology.
Jurnal Kajian Hukum dan Kebijakan Publik
, 3(2), 663–669.
Ertian, M. H., Jati, D. R., & Akbar, A. A. (2025). Kerawanan banjir pada permukiman di Kalimantan Barat.
Jurnal Ilmu Lingkungan,
23(5), 1359–1369.
Forest Watch Indonesia. (2024).
Hutan Papua dan Kalimantan alami deforestasi yang tinggi.
Diakses dari https://fwi.or.id/hutan-papua-dan-kalimantan-alami-deforestasi-yang-tinggi/
Global Forest Watch. (2025).
Dashboard perubahan tutupan hutan Kalimantan Barat.
Diakses dari
https://www.globalforestwatch.org/dashboards/country/IDN/12/?category=forest-change&lang=id

Indarti, S. H. (2017). Pembangunan Indonesia dalam pandangan Amartya Sen.
The Indonesian Journal of Public Administration (IJPA),
3(1), 35–50.
Lusiana, B., Widodo, R., Mulyoutami, E., Nugroho, D. A., & van Noordwijk, M. (2008). Kajian kondisi hidrologis DAS Kapuas Hulu, Kabupaten Kapuas Hulu, Kalimantan Barat (
Working Paper No. 60
). Bogor: World Agroforestry Centre.
Rahmania, H., Luthfi, H. M., Hadinugroho, D. S., Nurdin, & Jumaynah, F. (2026). Politik agraria dan konflik perkebunan sawit: Studi kasus perebutan lahan di Kalimantan Barat. ISO:
Jurnal Ilmu Sosial, Politik dan Humaniora
, 6(1), 1–10.
Ridwan, M., & Sarjito, J. (2024). Studi kajian dampak perubahan tutupan lahan terhadap kejadian banjir di daerah aliran sungai. Enviro:
Journal of Tropical Environmental Research
, 26(1), 38–45.
Sanusi, A. (2025).
Politik ekologi dan masa depan kebijakan lingkungan di Indonesia (Cetakan I)
. Cirebon: PT Arr Rad Pratama.
Subiman, N. L., & Resosudarmo, B. P. (2010). Tambang untuk kesejahteraan rakyat: Konflik dan usaha penyelesaiannya. Dalam I. J. Azis, L. M. Napitupulu, A. A. Patunru, & B. P. Resosudarmo (Ed.), Pembangunan berkelanjutan: Peran dan kontribusi Emil Salim (hlm. 426–449). Jakarta: Kepustakaan Populer Gramedia.
Sugandi, D., Agustiawan, D., Febriyanti, S. V., Yudi, Y., & Wahyuni, N. (2021). Identifikasi jenis mikroplastik dan
logam berat di air Sungai Kapuas Kota Pontianak.
POSITRON
, 11(2), 112–120.
Sulaeman, D., & Nindyarini, A. N. (2024, 2 Februari).
Manusia dan kompleksitas pengelolaan lahan gambut di Desa Permata. WRI Indonesia.
Diakses dari https://wri-indonesia.org/id/wawasan/manusia-dan-kompleksitas-pengelolaan-lahan-gambut-di-desa-permata
Utari, R. W., Iqbal, M., Manurung, A. R. F., Astuti, P. W., Aksy, & Bhaskara, R. S. (2019).
Kebijakan perlindungan ekosistem lahan gambut (konversi lahan gambut) terhadap ketahanan lingkungan di Daerah Aliran Sungai Kapuas, Desa Teluk Empening, Kecamatan Terentang, Kabupaten Kubu Raya, Kalimantan Barat (Laporan Penelitian Research Fellowship Pantau Gambut).
Fakultas Teknik, Jurusan Teknik Lingkungan, Universitas Tanjungpura.
Wahyuni, L. (2019). Potensi dampak lingkungan dalam audit ketidaksesuaian pemanfaatan ruang (Kasus Kecamatan Kasihan Kabupaten Bantul).
Jurnal Rekayasa Lingkungan
, 2019(2), 1.
Inside Pontianak. (2025).
Paradoks tambang bauksit di Kalbar: Hilirisasi digaungkan, pelanggaran hukum bermunculan.
Diakses dari https://insidepontianak.com/pontianak/42710/paradoks-tambang-bauksit-di-

kalbar-hilirisasi-digaungkan-pelanggaran-hukum-bermunculan