

KYT INDEX

Territorial Risk & Opportunity Analysis Insights for the Piracanga River Basin

KYT Municipal Data (Maraú, BA) × Piracanga Census 2025–2026

Municipality: Maraú (BA) | Biome: Atlantic Forest | Classification: Rural
Population: 24,527 | Area: 848.89 km² | Density: 28.89 hab/km²

**Piracanga Ecovila: 125 permanent residents | 87 households | 42 active organisations |
20 ha**

Census conducted December 2025 (116 valid responses) · KYT data: Green Bridge Facility / Instituto Igarapé (Dec 2025)

1. Context and Methodology

The KYT Index (Know Your Territory), developed by the Green Bridge Facility (GBF) at Instituto Igarapé, is a territorial risk analysis tool built on more than 70 municipal-level indicators organised into 6 dimensions. It is specifically designed to guide Nature-based Solutions (NbS) ventures — including carbon projects, ecotourism, conservation, and regenerative agriculture.

Piracanga is an intentional community and river basin located within the municipality of Maraú, southern Bahia, inside the Atlantic Forest biome and the Environmental Protection Area (APA) of Maraú. The Piracanga River microcatchment forms the ecological backbone of the territory. The KYT municipal data for Maraú represents the closest available territorial context for understanding risks and opportunities in the basin.

In December 2025, the community completed its first systematic primary data collection effort: the Piracanga Census 2025–2026, conducted by BIOMAS Territorial Intelligence with 116 valid respondents across 87 households. This report cross-references both datasets, highlighting where the KYT municipal signals apply to Piracanga, where they diverge, and what the census data adds that KYT cannot capture at municipal scale.

How to read the cross-reference tables

- **Confirms:** Census data aligns with or validates the KYT signal
- **Amplifies:** The KYT risk or opportunity is stronger inside Piracanga than the municipal average suggests
- **Diverges:** Piracanga's community profile clearly differs from the municipal average
- **Adds context:** The census reveals dynamics that KYT does not capture at municipal scale

2. KYT Scorecard — Maraú (BA)

Municipalities are classified into national quartiles (Low, Medium-Low, Medium-High, High) for both risk and opportunity independently. Maraú scores above the Bahia state average on opportunity (35.87 vs. 30.56) and below it on risk (21.05 vs. 23.59).

Dimension	Opportunity	Score	Risk	Score
OVERALL	Low	35.87	Medium-Low	21.05
1. Land Use Management	Low	40.35	Low	5.14
2. Climate & Nature	Medium-High	29.05	High	51.18
3. Economic Context	Medium-High	22.73	N/A	—
4. Social Fabric	Low	37.19	High	2.86
5. Institutional Presence	Medium-Low	50.02	Medium-Low	41.98
6. Security	N/A	—	High	4.08

Bahia state reference averages: Overall opportunity = 30.56 | Overall risk = 23.59. Dimension 3 (Economic Context) applies only as an opportunity dimension; Dimension 6 (Security) applies only as a risk dimension.

3. Dimension-by-Dimension Analysis

3.1 Land Use Management — RISK: LOW | OPPORTUNITY: LOW

This is Maraú's most favourable dimension: a risk score of just 5.14 vs. the Bahia average of 44.34, placing the municipality in the national LOW risk quartile for land and environmental governance. For Piracanga, this means the basin sits within a territory of relative forest integrity and low deforestation pressure — a crucial baseline asset.

KYT Indicator (Maraú municipal)	KYT Value	Piracanga Census / Context	Alignment
Natural vegetation: weighted moving average (2013–2023)	43,007 ha	Piracanga sits within the APA of Maraú. Satellite images (2001, 2010, 2020) document the microcatchment's Atlantic Forest canopy — the community's primary ecological asset and visitor magnet.	Confirms
Legal Reserve: surplus of native vegetation	16,695 ha	The 16,695 ha RL surplus across Maraú creates the legal basis for voluntary carbon credits (REDD+/VCS) and Environmental Reserve Quotas (CRAs). Piracanga's intact forest patches are part of this surplus.	Confirms
Deforestation: average annual (2012–2023)	1.14 km²/yr	Low deforestation is consistent with satellite imagery showing largely intact vegetation around the river basin. However, expansion of built areas since 2015 (Phase 3–4, diagnostic) is not captured by this aggregate metric.	Confirms
CAR: % of rural properties analysed and/or cancelled	0.19%	AMPLIFIED in Piracanga: 110+ private landowners, no collective legal protection, zero land trust or conservation easement in place. The census identifies land fragmentation as the community's #1 structural vulnerability.	Amplifies
CAR overlap with agrarian settlements (ha)	850.77 ha	The census confirms ongoing land tenure conflicts: speculative real estate pressure post-pandemic (Phase 4) is the dominant threat. Overlap with settlements signals latent conflicts in the broader basin.	Confirms
IBAMA embargoed areas: count	47	Not specifically located in Piracanga, but the 47 embargoed areas across Maraú signal historical compliance problems that affect the regulatory climate for any NbS project in the	Confirms

		municipality.	
Pasture: % of municipal area	4.92%	Low pasture coverage is consistent with Piracanga's forest-dominated landscape. The community has no significant cattle ranching within its 20-hectare footprint.	Confirms
Legal Reserve: deficit	1.44 ha	Near-zero deficit is highly favourable. Piracanga's core territory has no meaningful Legal Reserve deficit — a compliance advantage for any land-based project.	Confirms

Key insights for Piracanga — Land Use

- **Carbon opportunity is real:** The 16,695 ha RL surplus and 42.2 tC/ha carbon stock give Piracanga a documented basis for REDD+/VCS project structuring. The Territorial Development Plan (2026–2031) identifies RPPN (Private Natural Heritage Reserve) as the primary mechanism to lock in conservation permanently.
- **Land fragmentation is the critical risk:** With 110+ private landowners, no land trust, and 72% of residents as non-owners (census), the community cannot protect its territory through individual decisions. The KYT captures this only partially via the CAR analysis rate (0.19%).
- **The Community Attraction Paradox:** The KYT's low deforestation and high forest coverage scores mask a real dynamic: as Piracanga's ecological quality attracts more buyers, real estate speculation drives up prices, displacing the residents who maintain those very qualities. This feedback loop is invisible to KYT at municipal scale.
- **RPPN + land pact = double protection:** The Territorial Plan proposes combining RPPN applications (for forest areas) with a Community Right of First Refusal Pact (for built plots) — creating overlapping layers of protection that KYT indicators cannot predict but the census makes urgent.

3.2 Climate & Nature — RISK: HIGH | OPPORTUNITY: MEDIUM-HIGH

This dimension presents the sharpest tension for Piracanga: climate opportunity well above the Bahia average (29.05 vs. 14.23), but HIGH climate risk (51.18 vs. 48.92). The profile indicates a territory with significant hydrological and ecosystem potential, but also subject to extreme weather events and terrain instability — both directly relevant to the Piracanga River basin.

KYT Indicator (Maraú municipal)	KYT Value	Piracanga Census / Context	Alignment
Rainfall: total annual volume (1994–2024)	1,459.73 mm/yr	Adequate rainfall sustains the Atlantic Forest canopy and the river flow. The Piracanga River's hydrological function depends on this precipitation regime being maintained — any deforestation upstream would reduce infiltration and increase runoff.	Confirms
Months/year with adequate rainfall (120–300 mm)	5.47 months	Favourable for agroforestry and organic agriculture — systems the community already practices. 74% of residents compost; agriculture and permaculture are listed among the 42 active organisations.	Confirms
Primary vegetation: average carbon stock above ground	42.2 tC/ha	High carbon stock confirms the value of Piracanga's intact Atlantic Forest as a carbon sequestration asset. Combined with the 16,695 ha RL surplus, this is the primary economic basis for voluntary carbon market projects.	Confirms
Anthropic areas: soil water retention capacity	108.37 mm/m³	Good soil retention supports water supply for the community. However, expansion of built areas and access roads (visible in satellite imagery 2001–2020) reduces permeable surfaces over time.	Confirms
Frost: avg. days/year below 3°C	0 days	No frost risk is ideal for tropical permanent crops (cacao, banana, native Atlantic Forest species) — productive systems already practiced by some residents.	Confirms
Slope: % of municipal area above 12% grade	17.63%	AMPLIFIED in Piracanga: the basin's topography includes steep slopes along the river corridor. The diagnostic notes expansion into ecological buffer zones — areas likely on steeper terrain. Erosion and landslide risk is directly relevant to the microcatchment's water quality.	Amplifies
Natural disasters: financial	R\$ 587,469	Moderate disaster losses at	Confirms

damages		municipal scale, but for a 20-hectare community entirely within one river basin, localised flooding or landslide events can be disproportionately impactful.	
Recurring fires: % of municipal area burned $\geq 2x$	1.41%	Low fire recurrence is consistent with the Atlantic Forest's humid coastal climate. The community's composting and forest management practices further reduce fire risk locally.	Confirms

Key insights for Piracanga — Climate & Nature

- **Carbon stock = bankable asset:** 42.2 tC/ha × intact Atlantic Forest coverage = a quantifiable carbon sequestration asset. The Territorial Plan explicitly names RPPN registration and voluntary carbon markets as strategic tools for 2026–2027.
- **Slope risk is local and specific:** The KYT flag on 17.63% of Maraú above 12% slope is particularly relevant for Piracanga's microcatchment: riparian buffer zones on steep ground are the first line of defence against erosion and sedimentation. Water/effluent analysis has been conducted (CSV database) and should be integrated into continuous monitoring.
- **Climate opportunity above the Bahia average:** Piracanga's ecological conditions — 1,460 mm/year rainfall, zero frost, high carbon stocks, good soil retention — place it well above average for NbS viability in Bahia. This is a genuine competitive advantage for climate finance applications.
- **Carrying capacity and climate:** The Territorial Plan's proposed carrying capacity policy for visitors intersects directly with climate resilience: uncontrolled foot traffic on steep riparian zones accelerates erosion. Managing visitor numbers is simultaneously a climate and conservation action.

3.3 Economic Context — OPPORTUNITY: MEDIUM-HIGH

The economic context shows Maraú slightly above the Bahia average (22.73 vs. 20.56) as an opportunity — but the census reveals a striking divergence: Piracanga's resident population operates a fundamentally different economic model from the municipal average, with far higher income but severe vulnerability to real estate inflation.

KYT Indicator (Maraú municipal)	KYT Value	Piracanga Census / Context	Alignment
GDP per capita	R\$ 16,520	DIVERGES significantly: Piracanga census records an average resident income of R\$ 5,657/month — equivalent to ~R\$ 67,884/year, more than 4× the Maraú municipal GDP per capita. Yet residents are being displaced by financial pressure — the mechanism is real estate inflation outpacing income growth.	Diverges
Regional Economic Complexity Index (ICE-R)	-0.014	The negative ICE-R reflects Maraú's low economic diversification. Piracanga partially offsets this: the census maps 42 organisations across 20 types — from integrative health and alternative education to agroforestry, spiritual practices, and cultural enterprises.	Diverges
Agricultural production: % annual change (2011–2023)	+66.9%	Strong growth aligns with Piracanga's own expansion of regenerative agriculture, permaculture, and organic food production. 25 residents list gardening/composting as a talent; cacao, honey, and native species production are documented in the community.	Confirms
Federal transfers for sustainable agriculture (PRONAF/ABC/Renovagro)	R\$ 2.32M	Federal financing channels are active and accessible. Piracanga organisations focused on agroforestry and regenerative agriculture can apply for PRONAF/ABC resources — a direct economic opportunity the community has not yet fully mobilised.	Confirms
FEBRABAN Green Taxonomy: establishments	68	DIVERGES upward: the 42 active organisations in Piracanga — weighted toward sustainability, health, education, and culture — represent a disproportionately high green economy density for a 20-hectare territory within an 848 km ² municipality.	Diverges

FEBRABAN Green Taxonomy: % workers in qualified establishments	9.06%	The census maps 48 residents with integrative therapy skills, 25 with gardening/regenerative agriculture, and 19 with social technologies — a concentration of green economy capabilities far above the 9.06% municipal average.	Diverges
Technical courses: count	5	Limited municipal technical training capacity, but DIVERGES in Piracanga: 75% of residents hold university degrees — the highest educational attainment rate in the region. R\$ 5,267/month for white residents vs. R\$ 3,167 for Black residents signals a significant intra-community racial income gap.	Diverges
Road network: total length	89.65 km	Logistical isolation is a real constraint for the broader municipality. For Piracanga specifically, limited road access partially insulates the community from mass tourism but also restricts market access for locally produced goods.	Confirms
Universities: count	0	No local university, but Piracanga's resident talent base (75% university-educated, 29 with technology skills) creates internal innovation capacity. External partnerships with UESC (Ilhéus) and UFBA are documented in the diagnostic.	Diverges

Key insights for Piracanga — Economic Context

- **The income paradox:** Piracanga residents earn 4× the municipal GDP per capita average, yet 41% report difficulty sustaining costs (non-owners) and financial pressure is the #1 reason for leaving. Real estate inflation — not low income — is the economic threat. KYT does not measure this.
- **55% tourism dependency = structural vulnerability:** More than half of residents depend on tourism income. The community has no carrying capacity policy. An unmanaged tourism surge that degrades the ecological and cultural assets will collapse the very income source it generates.
- **Untapped talent inventory:** The census maps 71 people with management/planning skills, 55 in arts, 48 in integrative therapies, 29 in technology, 25 in regenerative agriculture. The Territorial Plan identifies this as a significantly underutilised asset for building a more resilient internal economy.
- **Racial economic gap requires explicit policy:** White residents earn R\$ 5,267/month on average vs. R\$ 3,167 for Black residents — a 40% gap within the same community. Any economic development strategy for Piracanga must address this disparity explicitly.
- **Carbon + ecotourism + agroforestry = the viable model:** The combination of carbon credits

(RL surplus, carbon stock), managed regenerative tourism, and agroforestry products represents the most viable diversification path — reducing tourism dependency while monetising ecological assets.

3.4 Social Fabric — RISK: HIGH | OPPORTUNITY: LOW

This is the most complex dimension to interpret for Piracanga. The KYT flags HIGH social risk for Maraú — but the census reveals that Piracanga's internal community profile diverges sharply from the municipal average on almost every social indicator. The community is not typical of rural Maraú. However, the census uncovers distinct social vulnerabilities that KYT cannot see.

KYT Indicator (Maraú municipal)	KYT Value	Piracanga Census / Context	Alignment
Children 0–5 with below-expected weight: cases	340	DIVERGES: Piracanga has 21 resident children in total. Municipal malnutrition data reflects the broader rural population, not the community. However, access to health services depends on urban centres (Itacaré, Maraú) — a shared constraint.	Diverges
BCG vaccine coverage: % of newborns	60%	DIVERGES but shares the access constraint: the low municipal vaccination rate reflects difficulty reaching dispersed rural communities. Piracanga residents travel to Maraú or Itacaré for conventional healthcare — the same access gap applies.	Diverges
4G/5G mobile network coverage: % of population	46%	CONFIRMS with local specificity: the census identifies limited digital connectivity as a real challenge for remote workers in Piracanga. Only 46% coverage directly limits the community's ability to earn remotely — its primary economic resilience mechanism.	Confirms
IDEA public high school score	3.3 / 10	DIVERGES: 75% of Piracanga residents hold university degrees. However, children of residents attend schools in Itacaré and Maraú (or the on-site Escola da Natureza for primary age). Secondary education quality remains a municipal weakness relevant to families.	Diverges
Deaths from self-inflicted injuries (2013–2023)	10	ADDS CONTEXT: the census lists emotional health as the 3rd main area residents want to improve (42 mentions). The community has 48 integrative therapists — a response capacity, but also a signal that mental health is a shared concern. The municipal data validates this signal.	Adds context
Slave labour: workers rescued (2017–2024)	7	DIVERGES entirely: this risk reflects the broader rural labour	Diverges

		market of Maraú, not Piracanga. The community profile (high education, self-employed, relatively high income) is structurally different from the agricultural workers captured in this indicator.	
Youth (15–29 years): resident count	6,086	Piracanga-specific: the census records 26 residents in the 18–25 bracket and 25 in 25–35. Young adults are present and active — 70% of all residents volunteer time for community initiatives. Youth demographic is an asset, not just a statistic.	Confirms
Social rights associations: count	1 (municipal)	DIVERGES upward: Piracanga maps 42 active organisations in 20 types — a density of civil society engagement that is highly atypical for a rural community of this size anywhere in Brazil.	Diverges
Triple Viral vaccine coverage	75%	Like BCG, reflects access constraints for dispersed rural populations — relevant for Piracanga families who depend on the same municipal health infrastructure.	Confirms

Key insights for Piracanga — Social Fabric (census-specific findings KYT cannot see)

- **Community NPS is only 48 (neutral zone):** 60% promoters, 22% detractors. Despite the strong identity with nature and regenerative culture, only 48% of residents actively recommend Piracanga as a place to live. Governance fragmentation and financial pressure are the most cited drivers of dissatisfaction.
- **72% of residents are non-owners:** This is the community's most acute social vulnerability — invisible to KYT. 57 of 79 census respondents do not own property. Financial reasons are the #1 cause of departure. Without structural land protection, the community that created Piracanga's ecological and cultural capital will be displaced by real estate inflation.
- **Racial wealth gap within the community:** Black residents report the weakest sense of community (67% feel 'little' community sense) and the lowest incomes (R\$ 3,167 vs. R\$ 5,267 for white residents). Any community development strategy that does not address this gap will deepen, not resolve, the social fragmentation that already shows in the NPS.
- **Social cohesion is at risk:** 34% of residents report a 'little' sense of community; only 20% feel a strong sense of belonging. Governance has been identified by residents as the #1 priority for 2026. Social fragmentation is the internal risk that KYT cannot measure but the census documents clearly.
- **Extraordinary human capital:** 71 residents with management/planning skills, 75% university-educated, R\$ 5,657 average monthly income — yet 41% of non-owners report medium-to-high difficulty covering basic expenses. This is a community where talent and financial vulnerability coexist, requiring targeted rather than generic economic interventions.

3.5 Institutional Presence — RISK: MEDIUM-LOW | OPPORTUNITY: MEDIUM-LOW

Maraú shows institutional presence slightly below the Bahia average on opportunity (50.02 vs. 53.15), but better risk performance (41.98 vs. 42.43). For Piracanga, the most critical indicator in this dimension is the near-absence of sanitation infrastructure — a direct threat to the river basin — combined with the absence of public banking services.

KYT Indicator (Maraú municipal)	KYT Value	Piracanga Census / Context	Alignment
Sewage network: % of households connected	7.75%	AMPLIFIED in Piracanga: the river basin context makes this critical. Untreated effluents directly contaminate the Piracanga River. Water and effluent analysis has been conducted (CSV database) and should be turned into a continuous monitoring protocol — as already proposed in the Territorial Plan.	Amplifies
Regular waste collection: % of households	53.52%	DIVERGES strongly: 99% of Piracanga residents separate solid waste, and 74% practise composting — far exceeding both the municipal average and Brazilian national norms. The community has invested significantly in waste management autonomy.	Diverges
Municipal councils: count	15	Piracanga maps 42 active organisations — but governance is fragmented, with no single body holding collective decision-making legitimacy. The Territorial Plan identifies governance integration as the #1 priority for 2026, proposing a Territorial Assembly as the legitimate coordination body.	Adds context
IGD-M (Bolsa Família/SUAS management quality)	0.88	Good social programme management at municipal level is positive context. However, Piracanga's residents are not primarily Bolsa Família beneficiaries — the governance challenges are at community scale (42 organisations, 110+ landowners), not social assistance scale.	Adds context
Banco do Brasil / Caixa: agencies and service points	0	CONFIRMS with direct impact: financial exclusion affects both the municipality and Piracanga. Residents must travel to access credit, government programmes,	Confirms

		and banking. This limits access to PRONAF/ABC financing and any community financial instrument.	
Health establishments (public+private): count	26	26 health establishments for 24,527 inhabitants. Piracanga relies on Maraú and Itacaré for conventional healthcare — consistent with this limited infrastructure. The community's 42 organisations include multiple integrative health practices, partially compensating for this access gap.	Confirms
Abstention in 2024 elections: %	14.19%	Low abstention is positive. The census shows Piracanga residents are highly politically engaged locally: 83.3% voted in the last territorial election, and 65.8% feel they have a voice in community decisions.	Confirms
Corruption/fraud: disciplinary procedures	0	No registered corruption procedures — positive signal for institutional climate. Census confirms: 68.4% of residents trust A.Mor (the representative institution), though only 20% are members.	Confirms
Fiscal information quality ranking	127.63	Moderate fiscal transparency. Piracanga's Territorial Plan proposes integrating data monitoring systems (the census database + territorial dashboard) as a governance infrastructure that goes beyond what the municipality currently offers.	Adds context

Key insights for Piracanga — Institutional Presence

- **7.75% sewage = direct river contamination risk:** This is the #1 environmental infrastructure risk for the Piracanga River. The water/effluent analysis database already exists. The next step is converting it into a continuous monitoring protocol tied to governance triggers — as the Territorial Plan proposes (monitoring indicator: water quality deterioration triggers immediate Assembly response).
- **Governance fragmentation > institutional presence:** KYT measures institutional presence through state and market structures. Piracanga's governance challenge is not the absence of institutions but their fragmentation: 42 organisations, 110+ landowners, no collective decision-making body with binding legitimacy. The Territorial Assembly proposal directly addresses this gap.
- **Waste management is a Piracanga competitive advantage:** 99% waste separation, 74% composting — this puts Piracanga in the top tier globally for community-scale environmental practices. This is a documented differentiator for ecotourism certification, carbon project credibility, and investment attraction.

- **Financial exclusion requires creative solutions:** No bank branch in Maraú means no conventional credit access. The Territorial Plan's Permanence Fund (subsidised rents for essential residents) and community land trust model operate outside conventional banking — appropriate responses to this structural gap.

3.6 Security — RISK: HIGH

Maraú presents HIGH security risk, above the Bahia average (4.08 vs. 3.36). For a municipality of ~24,500 people, the absolute scale of violent crime is limited, but the rate per capita is elevated. For Piracanga specifically, the most relevant indicator is land and water conflicts — confirmed and amplified by census data.

KYT Indicator (Maraú municipal)	KYT Value	Piracanga Census / Context	Alignment
Lethal violent crimes: annual average victims (2020–2024)	9/year	Not specific to Piracanga. The ecovila's community profile (urban-origin residents, alternative lifestyle, no agricultural labour conflicts) differs from the typical CVLI context. However, the rate contributes to Maraú's HIGH risk classification.	Adds context
Deaths from physical aggression (weighted moving avg.)	12 cases	Same as above — municipal aggregate not directly applicable to Piracanga's internal dynamics. The census does not flag physical safety as a concern among residents.	Diverges
Land and water conflicts: annual average (2012–2023)	1/year	AMPLIFIED in Piracanga: land tenure conflict is the community's dominant structural risk. 110+ private landowners, no collective legal protection, accelerating real estate speculation — the conditions for conflict are present and intensifying. The census explicitly identifies land fragmentation as the critical vulnerability.	Amplifies
Political violence and protests: annual average	2 events/year	Adds context: governance tensions within the community (between residents, non-residents, owners, and organisations) could manifest as forms of collective action or protests. The census notes governance fragmentation and competing interests among 42 organisations.	Adds context
Transport accidents: weighted moving average	3 cases	Relevant to Piracanga due to its road access constraints (89.65 km of roads for the entire municipality) and the community's dependence on external transport for health, education, and market access.	Confirms

Key insights for Piracanga — Security

- **Land conflict risk is the dominant security threat:** The KYT's 1 land/water conflict/year average understates the latent conflict potential in Piracanga. With 110+ private landowners and accelerating real estate speculation, the conditions for conflict — especially between community residents and external buyers — are at a historically high level.
- **The Territorial Plan's land protection measures are also conflict prevention:** RPPN registration, the Right of First Refusal Pact, and the proposed Land Foundation are not just conservation tools — they are conflict prevention mechanisms that reduce the number of contested transactions and establish legitimate community processes for land decisions.
- **Internal governance conflict is the security blind spot:** KYT measures external security (violent crime, land conflicts with traditional populations). The census reveals an internal risk: NPS of 48, fragmented governance, competing interests among 42 organisations and 110+ owners. This type of conflict does not appear in any KYT indicator.

4. Strategic Synthesis: Where KYT and Census Converge

4.1 What KYT Gets Right About Piracanga

The following KYT signals are validated and confirmed by the Piracanga census data:

Confirmed by census data

- **Natural capital:** 43,007 ha of native vegetation, 16,695 ha Legal Reserve surplus, 42.2 tC/ha carbon stock — all consistent with Piracanga's documented Atlantic Forest canopy and the community's ecological identity.
- **Climate opportunity:** 1,460 mm/year rainfall, zero frost, good soil retention, low fire risk — validated by the community's successful agroforestry, composting, and organic agriculture practices.
- **Low deforestation and land use risk:** Consistent with satellite imagery and community land management, though the census adds nuance: real estate pressure is now the primary driver of land change, not agricultural clearing.
- **Digital connectivity gap:** 46% 4G/5G coverage confirmed as a real constraint on remote work — the dominant income model for Piracanga residents (hybrid: R\$ 4,000/month; remote: R\$ 7,067/month).
- **Sanitation as environmental risk:** 7.75% sewage coverage creates direct river contamination risk — confirmed by the existence of the water/effluent analysis database and the Territorial Plan's monitoring alerts.
- **Land and water conflicts:** KYT flags 1 conflict/year; the census confirms that land fragmentation (110+ owners) and speculative pressure are at a critical threshold.

4.2 Where Piracanga Diverges from the Municipal Average

These are the dimensions where using Maraú's KYT data at face value would give a misleading picture of Piracanga:

KYT underestimates Piracanga's strengths

- **Education:** KYT IDEB 3.3 reflects public school performance. Piracanga residents: 75% university degrees — in the top tier of any Brazilian community, rural or urban.
- **Income:** KYT GDP per capita R\$ 16,520/year. Piracanga average: R\$ 5,657/month (R\$ 67,884/year) — 4× the municipal average.
- **Green economy density:** KYT 9.06% of workers in green economy. Piracanga: 42 organisations across 20 types, nearly all in sustainability, health, education, and culture — a concentration with no parallel in the region.
- **Waste management:** KYT 53.52% waste collection coverage. Piracanga: 99% waste separation, 74% composting — world-class for a community of this scale.
- **Civil society:** KYT 1 social rights association. Piracanga: 42 active organisations — an extraordinary density of organised social capital.

KYT underestimates Piracanga's risks

- **Gentrification and displacement:** No KYT indicator captures real estate speculation, tourist

gentrification, or community displacement. The census documents this as the dominant territorial risk — described as the 'Community Attraction Paradox.'

- **Governance fragmentation:** KYT measures institutional presence through state structures. Piracanga's governance challenge is internal: 42 organisations, 110+ landowners, no collective decision body. This is invisible to KYT.
- **Social cohesion:** KYT measures social risk through health and safety indicators. The census captures what KYT cannot: NPS 48 (neutral zone), 34% feeling little community sense, racial wealth gap, 72% non-ownership. Social fabric risk in Piracanga is structural and internal, not externally imposed.
- **Tourism carrying capacity:** KYT captures economic opportunity but not the contradiction between tourism income (55% dependent) and ecological/cultural degradation. This tension is Piracanga's core sustainability challenge.

5. Priority Actions for Piracanga (2026–2031)

Integrating KYT risk signals with census findings, the following strategic interventions are ranked by urgency and impact for the Piracanga River Basin:

Tier 1 — Immediate (2026): Structural Risk Mitigation

- **Land protection pact:** Formalise a Right of First Refusal Pact between aligned landowners and A.Mor/future Foundation. Target: 25% of properties in year 1. This is the only mechanism that can slow speculative displacement in the short term. (Addresses: KYT land conflict risk + census land fragmentation vulnerability)
- **Territorial Assembly:** Establish a quarterly Territorial Assembly with binding deliberation authority — the minimum governance structure to coordinate 42 organisations and 110+ landowners. (Addresses: census governance gap + KYT institutional presence opportunity)
- **RPPN applications:** Map eligible properties for RPPN registration with ICMBio. Target: initiate at least 3 processes in 2026. This locks in carbon sequestration assets permanently. (Addresses: KYT carbon opportunity + legal reserve surplus)
- **Water quality monitoring protocol:** Convert the existing water/effluent analysis database into a continuous monitoring system with governance-linked alerts. (Addresses: KYT HIGH climate risk + 7.75% sewage coverage amplified for river basin)
- **Racial equity in economic strategy:** Any income diversification programme must address the documented R\$ 2,100/month racial income gap explicitly. (Addresses: census-specific finding invisible to KYT)

Tier 2 — Short Term (2026–2028): Economic Resilience

- **Voluntary carbon project:** Structure a REDD+/VCS carbon project using Maraú's 16,695 ha RL surplus and 42.2 tC/ha stock as the baseline. Revenue stream to fund the Permanence Fund and habitat restoration. (Addresses: KYT carbon opportunity confirmed by census ecological data)
- **Tourism carrying capacity policy:** Define maximum simultaneous visitors for the territory. Direct a percentage of tourism revenue to the Permanence Fund. (Addresses: KYT economic opportunity + census 55% tourism dependency risk)
- **Talent activation platform:** Build an internal services exchange (skills marketplace + community currency) connecting the 71 management, 55 arts, 48 therapy, and 25 agroforestry talents documented in the census. (Addresses: census-specific untapped economic asset)
- **Land Foundation (Fundação Territorial):** Constitute a private non-profit Foundation to hold land permanently removed from the market. Target: first property acquisition by 2027. (Addresses: KYT land conflict + census 72% non-owner vulnerability)
- **Digital connectivity:** Partner with municipal and state governments or community networks to expand 4G/5G coverage. Direct impact on remote work income (R\$ 7,067/month for remote workers vs. R\$ 3,839 for in-person). (Addresses: KYT 46% connectivity coverage confirmed by census)

Tier 3 — Medium Term (2028–2031): Consolidation

- **Community housing (15 units):** Develop 10–15 Community Land Trust-model housing units by 2031, accessible to essential workers at income-based rents. (Addresses: census non-owner displacement risk)

- **Municipal ZEICA zoning:** Work with Maraú municipality to create a Special Cultural and Environmental Interest Zone (ZEICA) covering Piracanga — adding regulatory friction against large-scale speculation. (Addresses: KYT land governance gap + census speculative pressure)
- **Annual census + territorial dashboard:** Institutionalise a simplified annual census (15–20 indicators) and quarterly dashboard updates. (Addresses: both KYT and census monitoring gaps)
- **International positioning:** Document and publish the Piracanga model (BIOMAS framework + KYT + census) for Global Ecovillage Network (GEN), UNESCO, and climate finance communities. Target: GEN recognition by 2031. (Addresses: KYT economic opportunity through reputational asset monetisation)

Methodological Note

KYT data is measured at the municipal level (Maraú, BA) and represents the closest available territorial context for the Piracanga River Basin. Community-level indicators require primary data collection — which the Piracanga Census 2025–2026 now provides for the first time. The alignment analysis in this report (Confirms / Amplifies / Diverges / Adds context) is a qualitative interpretation based on cross-referencing both datasets. The KYT Index was developed by Green Bridge Facility (GBF) / Instituto Igarapé and published December 2025. The Piracanga Census 2025–2026 was designed and analysed by BIOMAS Territorial Intelligence. Primary data sources: IBGE, MapBiomas, PRODES/INPE, IBAMA, CAR, INCRA, DATASUS, RAIS, BCB, Ministry of Health, TSE, and others (KYT); direct survey of 116 residents across 87 households (Census).