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ALGORITHMIC ARCHIPELAGOS

Uneven Development Within Island Regions

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ABSTRACT

Public discussion frequently treats an island jurisdiction as a single territorial unit. Yet an archipelago is not one place with a uniform relationship to artificial intelligence. It is a field of unequal connections among capital islands, secondary centres, outer islands and remote communities. This paper asks how AI may reproduce, intensify or reduce inequalities within island regions. It draws on verified evidence from Scotland's islands, the Faroe Islands, the Maldives, Mauritius and Rodrigues, and Hawai'i. The cases show that advanced national or regional digital policy does not itself establish archipelagic equality. The distribution of connectivity, service continuity, usable data, institutional authority, skills, economic value and resilience matters as much as the presence of an AI strategy. The paper proposes an Archipelagic AI Equity Test for evaluating whether AI policy works across an island system rather than merely at its most connected centre. It argues that island governments should treat territorial distribution as a design requirement: publish island-disaggregated evidence, guarantee minimum service standards, devolve meaningful authority, support local capability and plan for failure as well as innovation.

Keywords: artificial intelligence; archipelagos; island regions; territorial inequality; digital governance; outer islands; infrastructure; island studies

1. INTRODUCTION: THE ISLAND IS NOT ONE PLACE

The territorial language of AI policy is often deceptively simple. A strategy applies to "the country", a broadband programme reaches "the islands", or a digital service becomes available "nationwide". These formulations can conceal the geography through which access, authority and benefit are actually distributed. In an archipelago, the decisive distinction may not be between island and mainland. It may lie between a capital island and an outer island, between a fibre landing point and a community reached through a weaker final connection, or between the institution that controls a dataset and the island whose life the data purport to describe.

Island scholarship has long challenged the idea that an archipelago is merely a collection of bounded land units. Stratford et al. (2011) describe archipelagic thinking as relational: islands are constituted through connections, separations and the spaces between them. This perspective is particularly useful for AI. An AI system does not arrive in an island territory as a detached piece of software. It depends on cables, mobile networks, cloud services, electricity, data, procurement systems, language resources, skilled workers and institutions able to contest errors. Those elements form an uneven network.

Recent empirical work reinforces the importance of looking below the island-wide or national average. Licio and Pinna (2026) show substantial internal differences in access to services within Sicily and Sardinia and identify the additional burden experienced by smaller islands around larger island regions. The OECD (2026) similarly warns that island-level data are frequently scarce or outdated and

distinguishes single, double and multiple forms of insularity. These findings matter for AI governance because aggregate indicators can make a digitally successful archipelago appear more territorially equal than it is.

This paper therefore asks three questions. First, through what mechanisms might AI reproduce centre–periphery relations within archipelagos? Second, what do selected island cases reveal about alternative pathways? Third, what policy test can make intra-archipelagic distribution visible before systems are procured or deployed?

The argument is not that every capital–outer-island relationship is exploitative, nor that digital concentration is avoidable in every field. Some specialist infrastructure and expertise will necessarily be shared. The narrower claim is that concentration should be recognised, measured and governed. Without explicit territorial safeguards, an AI programme can improve a jurisdiction's average performance while leaving its least connected communities with weaker services, less influence and a smaller share of the value created.

2. FROM DOUBLE INSULARITY TO ALGORITHMIC PERIPHERALITY

Double insularity traditionally describes the position of a smaller island whose access to major services and markets is mediated by a larger island as well as by a continental centre. The concept is not reducible to distance. Timetables, costs, administrative hierarchies and the location of specialist capacity all shape the burden. The OECD (2026) argues that policy must distinguish single, double and multiple configurations of insularity. Licio and Pinna's (2026) accessibility analysis shows why: within-island travel times and the relation between smaller and larger islands can produce markedly different practical access despite membership of the same region.

AI introduces another layer. Algorithmic peripherality arises when a community is formally included in a digital system but occupies a weak position in the infrastructure, data or decision-making network that sustains it. An outer island may have an online public service but lack reliable bandwidth during disruption. Its residents may appear in administrative records but not in sufficient detail to test local error rates. A local authority may use an AI tool but have little power over procurement, model design or complaint procedures. Inclusion at the interface can coexist with dependence underneath.

Five mechanisms deserve particular attention.

First, infrastructure investment tends to reflect population density, traffic demand and the business case for deployment. This can leave the final connection to small communities slower, more expensive or less resilient. The problem is not simply whether a nominal connection exists; capacity, latency, redundancy, affordability and repair time determine whether data-intensive services are dependable.

Second, institutional authority may remain concentrated even when service delivery is decentralised. Where procurement teams, data offices and technical advisers are based in the capital, outer-island institutions can become implementers of choices made elsewhere.

Third, data are commonly organised for administrative efficiency rather than territorial diagnosis. If small-island observations are merged into national or regional totals, uneven outcomes become statistically invisible. The OECD's (2026) call for better island-level evidence is therefore directly relevant to AI assurance.

Fourth, economic value follows ownership and capability. A locally used system may generate contracts, intellectual property and skilled employment elsewhere. Local participation requires more than consumption: it includes the ability to commission, adapt, maintain, evaluate and, where appropriate, build systems.

Fifth, failure follows network topology. A single cable route, cloud dependency or small pool of specialist staff may become a critical point of failure. Resilience is thus part of distributive justice. Communities at the end of a fragile chain experience a different digital state from those served by redundant routes and nearby expertise.

3. METHOD AND EVIDENCE

The paper uses a structured comparative reading of five island settings. They were selected to illuminate different forms of archipelagic governance rather than to create a league table. Scotland provides a dispersed set of island communities within a larger state. The Faroes offer a highly connected, self-governing archipelago. The Maldives is a geographically dispersed island state pursuing digital public infrastructure and locally initiated services. Mauritius and Rodrigues expose the distinction between a national AI ambition and the operational capacity of a secondary island. Hawai‘i provides a multi-island subnational jurisdiction with statewide operational guidance for generative AI.

Claims are based only on sources whose existence, bibliographical details and relevance were checked. Wherever possible, the complete report or the relevant pages were inspected. Evidence is drawn from peer-reviewed articles, OECD and World Bank publications, audit reports, government documents and official institutional pages. Corporate material is used only for limited factual claims about infrastructure owned or operated by the organisation and is identified as such. Announcements are not treated as proof of completed implementation, and guidance is not described as legislation or an adopted comprehensive AI strategy.

The comparison is organised around seven dimensions: infrastructure, service continuity, data visibility, authority, capability, value retention and resilience. These dimensions become the Archipelagic AI Equity Test proposed in Section 10.

4. SCOTLAND'S ISLANDS: DISTRIBUTED PROVISION, UNEVEN CONDITIONS

Scotland's 2025 National Islands Plan annual report provides unusually specific evidence about island connectivity. By the end of October 2025, more than 6,300 full-fibre, gigabit-capable connections had been delivered on Scottish islands through the wider Reaching 100% programme, with a further 419 island connections delivered through voucher support (Scottish Government, 2026). The report names communities across Mull, Tiree, Luing, Orkney, Shetland, Skye and Lewis, allowing the reader to see that deployment was not confined to one urban centre.

The same report records work on seven rural private 5G base stations on Westray and Papa Westray, Flotta and Hoy. It also reports that five island organisations participated in an AI Readiness Programme and that nine island businesses received AI vouchers of up to £1,500 (Scottish Government, 2026). These are modest interventions, but they matter because they connect infrastructure policy to organisational capability rather than assuming that connectivity automatically produces meaningful AI adoption.

The evidence nevertheless does not establish uniform experience. A count of premises passed or connected does not reveal affordability, service reliability, local technical support or whether every island institution can use advanced digital tools. Nor does a small readiness cohort demonstrate system-wide capability. The Scottish case is therefore best understood as evidence of geographically attentive delivery, not proof that archipelagic inequality has been solved.

Its policy lesson is twofold. Named-place reporting is more informative than a national average, and capability support should accompany infrastructure. A stronger next step would report service quality and AI participation by island, including unsuccessful applications, outages and the distribution of public-sector use. Territorial transparency is essential because an apparently successful programme can still contain small pockets of exclusion that disappear in aggregate statistics.

5. THE FAROE ISLANDS: CONNECTIVITY AS SOCIAL INFRASTRUCTURE

Nordregio's 2026 study presents the Faroes as a connected society across eighteen islands, supported by fibre, 5G and digital public services. It describes applications including elderly-care sensors, street-light management, traffic systems and digital governance, with examples in Tórshavn and beyond (Brynteson and Tybjerg, 2026). Its most important contribution is conceptual: connectivity is treated not simply as a telecommunications market but as infrastructure for equal access, local services and community resilience.

The archipelago's external connections also illustrate the importance of redundancy. According to its operator, Shefa owns the SHEFA-2 cable linking the Faroes, Shetland and Orkney to Scotland and took over CANTAT-3, which connects Iceland and the Faroes towards Denmark and Germany. The operator

also describes access to Farice and Danice routes (Shefa, 2026a; 2026b). These statements are operator evidence rather than independent measures of performance, but they are adequate for establishing the named routes and ownership claims.

Strong connectivity does not remove governance questions. Nordregio identifies cybersecurity, skills, data protection and dependence on critical infrastructure as continuing challenges (Brynteson and Tybjerg, 2026). A well-connected outer island can still be peripheral if systems are designed, purchased and evaluated exclusively in the capital. Conversely, shared archipelagic infrastructure can reduce inequality when it is paired with universal-service commitments, local implementation capacity and multiple routes for continuity.

The Faroese case therefore warns against treating remoteness and connection as opposites. A remote place can be deeply connected, while a nominally connected place can remain institutionally peripheral. The relevant measure is whether residents can rely on the network for important services and exercise influence over how those services are organised.

6. THE MALDIVES: DIGITAL DECENTRALISATION AND ISLANDER AGENCY

The Maldives makes the challenge of archipelagic distribution especially visible. A World Bank feature describes hundreds of scattered islands and notes that broadband on outer islands can be limited and costly (World Bank, 2022a). In 2022, the World Bank approved a US$10 million grant for a digital development project intended to increase broadband competition, strengthen digital identification and cybersecurity, and improve the use of data and analytics for climate resilience. The official announcement explicitly identified affordability and quality problems in outer atolls (World Bank, 2022b).

These initiatives should not be presented as evidence that the access problem has been resolved. UNDP's 2025 digital assessment records progress in basic infrastructure and services while identifying continuing challenges in regulation, coordination and citizen engagement (UNDP Maldives, 2025). The sequence is important: investment creates possibilities, but institutions, public trust and local participation determine whether those possibilities become durable capabilities.

The Maldives also supplies evidence of islander agency. The World Bank's feature highlights Hologo, an education platform, and OdiApp, a local transport service, as locally initiated digital responses to dispersed geography (World Bank, 2022a). Their relevance here is not that they are necessarily AI systems. It is that they show island actors defining problems and building services around archipelagic life. AI policy should learn from that direction of travel. The objective should not be to import generic systems and then adapt island communities to them, but to enable islanders to identify priorities, commission tools and retain useful knowledge and value.

A distributionally serious Maldivian AI policy would consequently assess bandwidth and affordability by atoll, test digital public services under disrupted conditions, and involve outer-atoll institutions in

design and evaluation. It would also make room for small firms and civic organisations to originate solutions, with safeguards against transferring their data or intellectual value to external vendors without proportionate return.

7. MAURITIUS AND RODRIGUES: NATIONAL AMBITION, SECONDARY-ISLAND CAPABILITY

Mauritius officially launched a National AI Strategy and FAIR Guidelines in April 2026. The responsible ministry presented these instruments as applying across the Republic and emphasised local innovation, inclusion and responses to community needs (Mauritius Ministry of Information Technology, Communication and Innovation, 2026; UNDP Mauritius and Seychelles, 2026). The launch establishes a national policy commitment, but it does not by itself show how implementation capacity is distributed among Mauritius, Rodrigues and the Republic's other islands.

The most useful counterpoint is the report of the Director of Audit on the Rodrigues Regional Assembly for 2021–22. Published in February 2023, it found that an ICT company created by the Assembly was not operational because it lacked the required licence. It also reported that only 14.4 Gbps of the 100 Gbps capacity available through the MARS cable had been sold by September 2022 and that no strategic plan had been prepared for the company (National Audit Office, 2023, pp. 47–48). The report further discussed difficulties with an e-licensing system, reinforcing the distinction between possessing infrastructure and sustaining usable institutional capability.

These findings predate the 2026 AI strategy and should not be used to claim that current conditions are unchanged. They do, however, provide verified evidence of an implementation gap that national AI planning must address. Cable capacity is not equivalent to local capability. A secondary island needs institutions that can plan, procure, operate and evaluate digital services, as well as a realistic market and public-service model.

More recent ministry reporting indicates attention to digital transformation in Rodrigues and, in August 2026, announced an intended two-year satellite connection for Raphael Island in St Brandon, described as aligned with national digital and AI ambitions (Mauritius Ministry of Information Technology, Communication and Innovation, 2026b). Because this was an announcement, it should be monitored as an implementation commitment rather than recorded as a completed outcome.

The Mauritius–Rodrigues case demonstrates why a national strategy requires an archipelagic implementation annex. Such an annex should specify island-level responsibilities, budgets, skills, infrastructure dependencies and measures of benefit. Otherwise national ambition risks being judged at the point where capacity is already strongest.

8. HAWAIʻI: STATEWIDE GUIDANCE AND THE NEED FOR ISLAND-LEVEL ASSURANCE

The State of Hawaiʻi's GenAI Assistant Technologies Usage Guidelines provide an operational framework for state agencies. Document CDO-007 was approved on 16 December 2024 and published on 28 March 2025. It applies across state agencies and addresses human oversight, disclosure in public interactions, security and restrictions on entering non-public data into generative-AI systems. The document describes compliance as strongly recommended rather than creating a comprehensive statutory regime (State of Hawaiʻi State Data Office, 2025).

This is a valuable administrative baseline, but a statewide rule does not reveal whether agencies and residents across the islands encounter the same conditions. The State Data Office's wider strategy distinguishes statewide responsibilities from department, division and county activity and refers to collaboration with the counties (State of Hawaiʻi State Data Office, n.d.). That institutional structure creates an opportunity for layered governance, yet the inspected guidance does not provide island-disaggregated evidence on uptake, accuracy, complaints, workforce effects or service outcomes.

Hawaiʻi therefore clarifies the difference between common safeguards and territorially differentiated assurance. Rules on privacy, disclosure and human review should apply everywhere. Evaluation, however, must ask whether a system performs differently across languages, local contexts, agencies and islands. Statewide consistency and island-level scrutiny are complementary, not competing, goals.

A practical approach would require agencies to record where consequential AI-supported decisions are made, publish island-disaggregated performance where privacy permits, and provide accessible non-digital routes for residents. County and community institutions should participate in risk assessment when a system depends on local cultural, environmental or administrative knowledge.

9. COMPARATIVE FINDINGS

The cases do not form a simple hierarchy from "advanced" to "lagging". They reveal different strengths and vulnerabilities.

Scotland demonstrates the value of reporting named island communities and pairing network investment with small-scale readiness support. The Faroes show how connectivity can be understood as social infrastructure and why external-route resilience matters. The Maldives combines national digital investment with examples of locally initiated services, making islander agency visible. Mauritius illustrates the danger of inferring secondary-island capability from national ambition, while the Rodrigues audit supplies unusually concrete institutional evidence. Hawaiʻi provides operational AI guidance but leaves open the question of island-disaggregated implementation.

Across the cases, four conclusions recur.

First, availability is not continuity. A connection or online service may exist without being affordable, reliable or resilient enough for essential use.

Second, inclusion is not authority. Residents can be users or data subjects without having meaningful influence over procurement, objectives, evaluation or redress.

Third, representation is not visibility. Data may include outer-island residents while published statistics remain too aggregated to detect local disparities.

Fourth, use is not value retention. AI adoption can increase efficiency while contracts, expertise and intellectual property accumulate outside the community.

These distinctions explain why a national AI strategy and an archipelagically just AI policy are not the same thing. The former can be sophisticated in ethics, skills and innovation while remaining territorially thin. The latter must specify how rights, capabilities and benefits travel across the island system.

10. THE ARCHIPELAGIC AI EQUITY TEST

The following seven-part test is intended for strategies, procurements, pilots and public-service deployments. It is diagnostic rather than a numerical ranking.

1. Infrastructure

Can every affected island access the bandwidth, devices, electricity and cloud services necessary for meaningful use? Evidence should address quality, affordability and repair time, not only nominal coverage.

2. Service continuity

What happens during cable, power, transport or cloud disruption? Essential services require tested fallback arrangements, including human and offline routes.

3. Data visibility

Can outcomes and error rates be examined by island or island group without compromising privacy? If results are reported only at national or regional level, small populations may disappear statistically.

4. Authority

Which island institutions and communities help define the problem, select the system, set safeguards and review performance? Consultation after procurement is weaker than participation before design.

5. Capability

Are local organisations able to commission, adapt, maintain and challenge the system? Training should include governance, evaluation and procurement, not simply end-user instruction.

6. Value retention

Where do contracts, skilled employment, data-derived value and intellectual property accrue? Public support should create realistic opportunities for island firms, workers and institutions.

7. Resilience

Does the system reduce or deepen dependency on single vendors, routes, datasets or specialists? Resilience includes cybersecurity, interoperability, exit plans and local knowledge of how to operate when automation fails.

A proposal should not be described as archipelagically inclusive merely because it is accessible online. It should be able to answer each question with evidence and identify who is responsible for closing gaps.

11. A POLICY PROGRAMME FOR FAIRER ALGORITHMIC ARCHIPELAGOS

Ten commitments would translate the test into practice.

First, publish an archipelagic baseline before major AI deployment. It should map connectivity, service quality, workforce capability, data gaps and critical dependencies by island.

Second, adopt minimum digital-service standards. These should cover affordability, reliability, accessibility, response times and non-digital alternatives, with clear remedies where standards are not met.

Third, require island-disaggregated impact assessment. Procurement and evaluation should identify whether benefits, errors and burdens vary across islands.

Fourth, create outer-island representation in AI governance. Representatives need agenda-setting and review powers, not merely advisory status.

Fifth, fund local capability over time. Short workshops can introduce tools, but sustainable capacity requires posts, partnerships, procurement expertise and peer networks.

Sixth, use challenge-led local innovation. Island communities should be able to define problems and compete for resources to address them, including through non-AI solutions where those are more appropriate.

Seventh, design for interoperability and exit. Public bodies should be able to move data, change suppliers and continue essential functions when a system or vendor fails.

Eighth, retain proportionate value locally. Contracts can include local training, transparent data arrangements, support for island enterprises and public-interest rights in publicly funded outputs.

Ninth, test disruption scenarios. Exercises should examine cable failure, power loss, cyber incidents, transport disruption and the sudden loss of external technical support.

Tenth, maintain a public archipelagic ledger. Governments should report deployments, purposes, suppliers, safeguards, evaluation results and territorial distribution in an accessible, updateable record.

These commitments do not require every island to host every capability. They require shared systems to be organised so that concentration does not become unaccountable dependency.

12. CONCLUSION

AI makes archipelagic relations more consequential, not less. Digital systems can reduce travel burdens, extend specialist services and connect dispersed communities. They can also concentrate authority, obscure territorial disparities and make outer islands dependent on infrastructure and expertise they do not control.

The cases examined here show that there is no single island pathway. Strong networks can support social equality, but they introduce critical dependencies. National investment can expand opportunity, but implementation may remain uneven. Operational guidance can establish common safeguards, but it does not substitute for island-level evidence. Local digital initiatives demonstrate agency, but supportive institutions are needed if islanders are to shape AI rather than simply consume it.

The appropriate unit of analysis is therefore the archipelago as a network of unequal but connected places. Policy should ask not only whether an AI system works, but where it works, for whom, under whose authority, and what happens when the connections on which it depends fail. The Archipelagic AI Equity Test offers a practical way to make those questions unavoidable. Its central principle is simple: an island region should judge digital progress from its edges as well as from its centre.

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SOURCE NOTE

The evidence and links in this revision were checked on 14 September 2026. Policy status is stated conservatively. Official announcements are treated as announcements, operational guidance as guidance, and operator sources only as evidence for limited claims about their own infrastructure.