

## ENERGY CHECK ON ÁRRAIN MHÓR



*The Árrain Mhór lighthouse is located at Rinn Ramharois Point at the north west corner of the island*

## Energy check on Árrain Mhór

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## 1 Introduction

In 2013, Arrain Mhór joined the SMILEGOV<sup>1</sup> project through its membership in *Irish Islands Federation* and subsequently in the *European Small Islands Federation* (ESIN). The objectives of SMILEGOV, funded by the European Commission, is to establish a clear picture of the island's energy consumption, its emissions and how it is supplied with energy, moving into an action plan for a more sustainable future, and to invite the island to join the Pact of Islands<sup>2</sup>.

With Árrain Mhór, the work has been a broad attempt to understand the context in which energy is a possible focus of development. The description of the island starts with the people, continues with the political system and ends with the island as a geographical, technical platform for the islanders. Kind of backways, not just describing the island as a place, a geographical location defined by area and location, roads and ferries; Neither the island as just a theatre where people try to get on with each other and settle local disputes over grazing, ferry timetables, water costs, pollution, tourism taxes and subsidies, linking them to their masters on the mainland and in Brussels.

This is a check – an audit – rather than a plan, based on existing documentation such as Nicolas Loncle's excellent

study *Analysis of an insular system and its resources. A contribution to the elaboration of a development strategy for Arranmore Island, county Donegal, Ireland*<sup>3</sup>, Alyne Delaney's *Donegal Islands Survival Plan*<sup>4</sup>, the *Árrrain Mhór Energy Plan 2012-2031* from the IRDA project<sup>5</sup> and desktop research, this compilation has been done by Senior Advisor Christian Pleijel, Vice President of ESIN (*European Small Islands Federation*).

Islands are miniatures of the world, solitary, clearly separated from the mainland by the sea. Being small, distant and vulnerable, Árrain Mhór needs to plan and develop itself in a subtle and continuous manner, handling the complexity of people, politics and infrastructure.

September 2015,  
Christian Pleijel

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<sup>3</sup> Loncle N, 2006. *Analysis of an insular system and its resources. A contribution to the elaboration of a development strategy for Arranmore Island, county Donegal, Ireland*. Thesis of a the Master course in Land Management, Development, Environment, Institut de Géoarchitecture, Université de Bretagne Occidentale

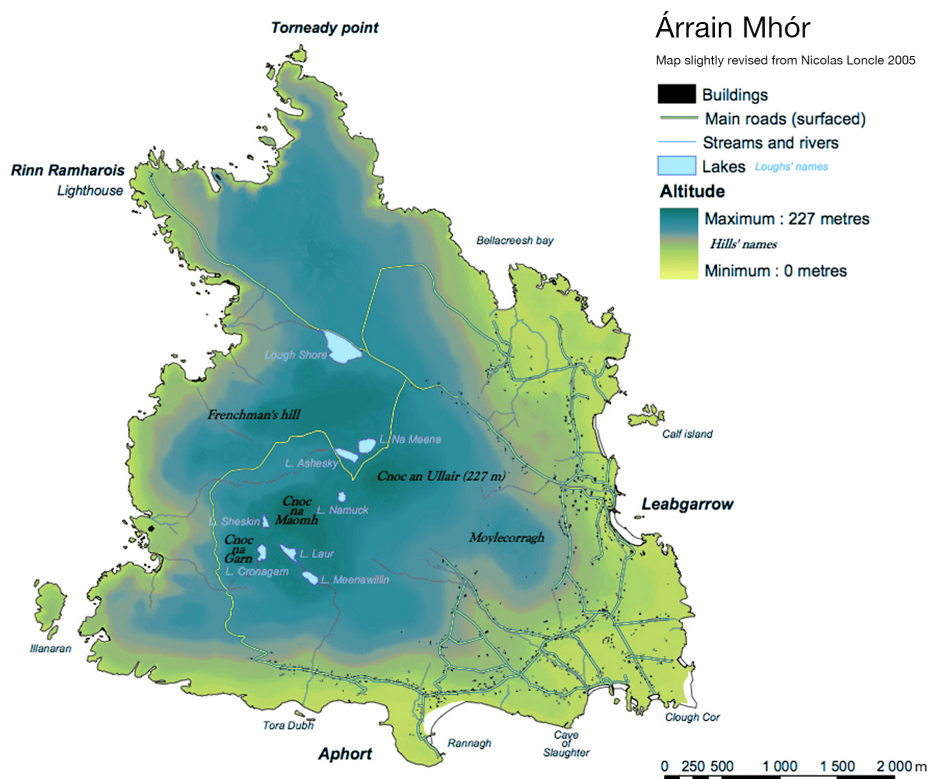
<sup>4</sup> [www.a-turning-tide-in-the-life-of-man-film.eu/fts/23350](http://www.a-turning-tide-in-the-life-of-man-film.eu/fts/23350)

<sup>5</sup> [http://enrd.ec.europa.eu/enrdstatic/policy-in-action/rdp\\_view/en/view\\_project\\_9320\\_en.html](http://enrd.ec.europa.eu/enrdstatic/policy-in-action/rdp_view/en/view_project_9320_en.html)

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<sup>1</sup> <http://www.sustainableislands.eu/>

<sup>2</sup> <http://www.islepact.eu/html/index.aspx>



Map of Árrain Mhór, slightly revised after Loncle (2005)

## 2 The islanders

Árrain Mhór – in English Arranmore – lies 5 kilometres off the northwest coast of Ireland. It is the second largest island in Ireland covering 22 km<sup>2</sup>. The island is part of Donegal County.

It is said there are 365 islands around the coast of Ireland – one for each day of the year. Excluding islands which are uninhabited or are connected by bridges to the mainland, the total is 53. Many of these are inhabited by only a handful of people. All of them are close to the coast: none is more than 13 km from the nearest point on the mainland

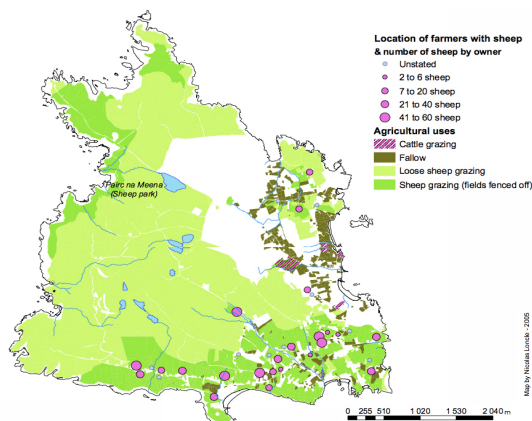
and most are within a few hundred meters. The islands have no local autonomy, each being a part of an adjacent mainland county.

### Population

Árrain Mhór has a resident population of 514 (2011), down from 543 in 2001, 596 in 1991, over 800 in 1981 and 948 in 1961 – 50 years ago. The population grows to 1,500 during summer when ex-pat families return and visitors arrive.

At the end of the 17<sup>th</sup> Century, Árrain Mhór was a centre for herring fisheries, with over 1,000 people employed

in the industry. However, in the mid-1800s a combination of clearance by the landowner and famine hit the population hard and many families left for the New World.



*Agricultural land use and fallow land, Loncle, page 57*

Fifty years ago, sustainable subsistence farming was still part of life: farming, fishing, using turf/peat as a local fuel source, money sent home from abroad was 50% of Ireland's GDP in the 1950's.

Emigration has always been a fact of island life, still is today. To succeed you must leave the island. Sometimes you leave your wife and family at home. The weakness or the absence of employment structures obliged the islanders to follow the traditional way of emigration. But emigration is often temporary. After years away, emigrants came back to settle on the island at different times of life.

Returning migrants have generally worked in tunnelling and construction for men; hotel and factory work

for women. Without these returns, population levels and demographic structures would probably be really critical.

Now, traditional fishing and agriculture have declined significantly. The age profile of islanders is increasing and there is a high dependency on social welfare and other state supports. A quarter of islanders are unemployed and there is 56% male unemployment.

### Trade & Industry

Enterprises started on the island include a textile industry that had to close 1979 because of the general industry crisis, a bakery shut 1991, a craft shop that faced insufficient market, mussel farming that was closed in 1998 because of azaspiracid toxin and bad weather conditions, bicycles to rent, holiday homes, lighthouse accommodation, Irish language courses facing limited market and concurrence and a tele call centre running for two years 2002-2004.

#### *The Tele Call centre*

The tele call centre the *Tele Airann Teo* was supposed to create 20 fulltime jobs after 18 months. A private company based in Sligo was managing the project in partnership with five state agencies. Islanders were trained to telemarketing before the start-up date but the enterprise only lasted two years and employed no more than seven people.



Problems faced by the enterprise were of different nature: technological (no internet broadband), difficulties of recruitment and retention of staff for telesales, inadequate staff competence, the cost of the daily ferry travel made it difficult to recruit a manager but nonetheless management was by an outsider and "the arrival of a stranger on small islands especially to set up a business is generally looked distrustfully"<sup>6</sup>.

Deception was proportional to the hopes placed into the project by the main partners Údarás na Gaeltachta and Arranmore Island Co-Op as an enterprise such as this was seen as the only type of business that was passing over the problems of over-cost of ferry travel, and then could be competitive.

The project was not conducted merely in a commercial logic. The main socio-economic objective was to create employment.

### *Tourism*

Tourism is the only growing activity although building and the health sector are giving on the island but it is difficult to create new jobs.

There are 300 beds on the island and they are generally all occupied in summer. Half of the capacity is concentrated in Leabgarrow, half is spread until Ploghoe. Accommodation types are:

- two hotels and the youth hostel, 100 beds
- the holiday village with 8 self-catering houses, and 4 other self-catering, all in all some 100 beds;
- 14 B&B, more than 100 beds as some owners also take Irish College students.

### **Services**

Árrain Mhór manages to keep service at a fairly high level although being well below the threshold populations for shops/services as defined by An Foras Forbartha (an Irish state agency which became the Environmental Protection Agency in 1992)<sup>7</sup>:

	Average population threshold	Árrain Mhór population	Service on Árrain Mhór
Small shop	150	Under 600 dwellers	2
Primary school	700		2
Post Office	1 500		1
Library	2 000		Delivery
Doctor	2 000		1
Dentist	3 000		Regular visits
Secondary School	4 000		1

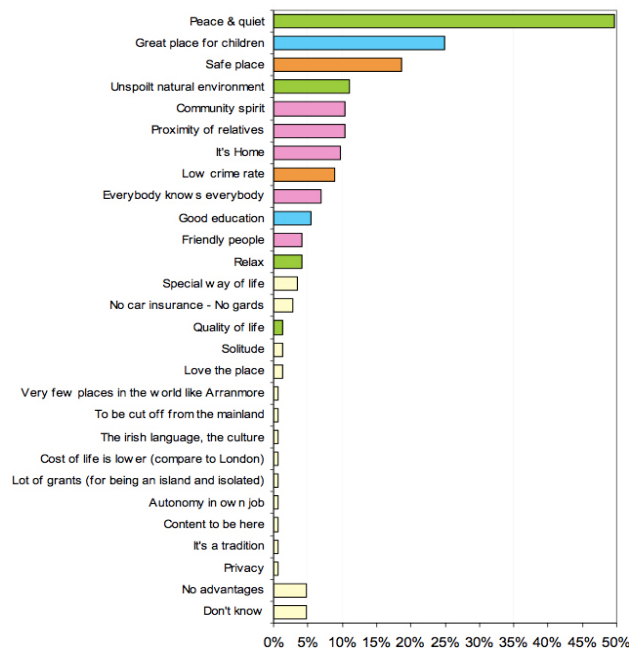
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<http://www.irishtimes.com/opinion/downside-of-one-off-rural-housing-1.376468>

<sup>6</sup> Nicolas Loncle

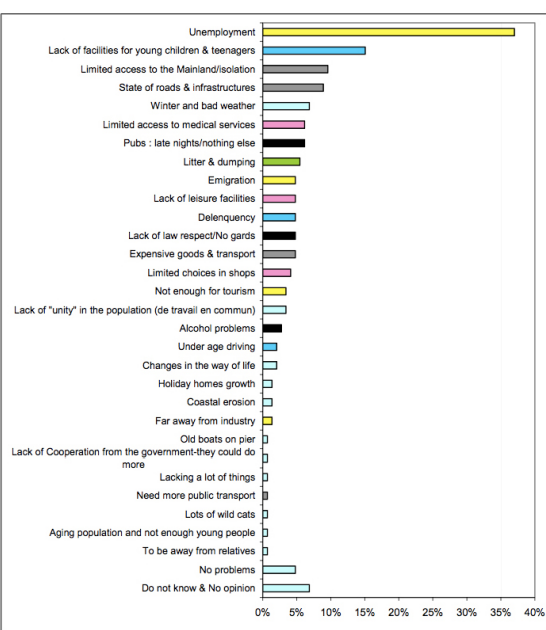
Advantages and problems

In his 2006 study, Nicolas Loncle made a questionnaire, asking the islanders about the principal advantages of living on the island (145 respondents):



Source: Loncle, apendixVII

He also asked them: "in your opinion, what are the main problems faced by Árrain Mhór (146 respondents):



Source: Loncle, apendixVII

### 3 Governance

CPMR islands expert Jean-Didier Hache wrote in 2000:

*« In their vast majority, the European States having responsibilities over islands have acknowledged – albeit in many varying ways – that these territories were deserving some form of special consideration in political and administrative terms. »*

What makes the Ireland case original is the areas and the population sizes being so small. In 2000, Eamon O’Cuiv – a well-known Irish politician with a strong passion for the islands – wrote:

*« The island population have been given a voice at the heart of Government even though the normal democratic process does not endow such a small dispersed population with an island elected representative at either local or national levels. »*

There are five identified levels of governance:

Local level	Árrain Mhór Island Co-op (180 members) Árrain Mhór Development and Employment Co-op (130 members) Árrain Mhór Energy Committee
County level	Donegal County Council (financing of infrastruc-

	ture. Main roads are under Council competency but on delegation to Arranmore Island Co-op ) Udaras na Gaeltachta (financing of individual projects)
Irish islands level	Comhdháil Oileáin na hÉireann (linking the islands to the central government) Islands Leader program within the National Rural Development Plan (delivering and administration of EU programs)
National level	Roinn na Gaeltachta (annual administration grant) Central government (financing of infrastructure)
European level	European Small Islands Federation ESIN Interreg program IRDA project Smilegov project

Do the different levels of governance act as a filter or as a relay? One might ask why there are three cooperatives on the island? And are the co-ops strong and competent enough to get their proposals through the competition for EU funding?

## 4 The island as a platform

The number of people that actually use the island as a platform for different purposes are far more than 514 and might be calculated as follows:

Residents (365 days)	514	187,610
Summer resid's (30 days)	1,500	45,000
Visitors (1 day)	33,000	33,000
Sum		265,610

265,610 man-days divided by 365 gives 728. The number of people using the Árrain Mhór as a human society is equivalent to a population of 728 all-year residents. That is the base for calculating the island's ecological footprint. As a platform for human life, from an infrastructural and a sustainable perspective, the Aran Islands serves 728 people, not 514.



*Aphort harbour)*

### Access and transport

Ireland is the most car-dependent country in the world. Irishmen drive 24,400 km per year compared to the US average of 19,000 km, the UK at 16,100 km, France at 14,100 km and Germany at 12,700 km, according to Transport Investment and Economic Development, which was published in 2000<sup>8</sup>.

The ferry service was an enormous boost to the island economy with regular services starting in 1984. Most islanders bring their car on the ferry as they are going to Dungloe 10 km from Burtonport or Letterkenny which is over one hour by road.



*MV Rhum unloading at Leabgarrow*

The sea passage is with ro-ro WWII landing-craft type ferries, some 40 years old, taking 7-8 cars and well over 100 passengers making the 4 kilometres passage in under fifteen

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<http://www.irishtimes.com/opinion/downside-of-one-off-rural-housing-1.376468>



minutes (the Arranmore Blue ferry) or 20 minutes (the Arranmore Island Ferry).

In 2014, both ferry companies transported 26,891 islanders and 31,770 visitors to/from Árrain Mhór, making over 8,000 single trips a year.

Some people mention a bridge to Arranmore as a solution to unemployment and to remoteness. Others would not like to see a bridge built in any circumstances. For an island, the bridge is the ultimate infrastructure because it removes the insularity. A bridge would permit inhabitants to go daily to work on the mainland, and would limit transport cost for production activities. It would probably increase visitors influx and associated consequences upon network and infrastructures. The tranquillity and the security, appreciated by islanders, would probably be less, but tourism would probably grow.

### **Water**

Since the 1970's, water is taken from a reservoir on the largest natural lake linked to a filter plant. In 2010, the water use was 131 million litres.

Water sewage treatment is individual septic tanks but there is a collective water treatment in project.

### **Waste**

Domestic waste is estimated at around 400 tonnes in 2010. There has been a litter problem in the island having its roots in a tradition of residents buying cheap, worn-down

cars on the mainland for use exclusively on the island.

Since there is no Garda station, many of the 500 islanders did not see fit to tax or insure their vehicles, which were sometimes driven to the point of breakdown and then abandoned.

The practice came to an end when a number of islanders were prosecuted for driving without the appropriate documents after gardaí maintained a full-time presence during a whole summer. In the spring of 2008, a major clean-up operation was managed by the County Council<sup>9</sup>.

### **Energy consumption**

#### *The IRDA project*

In 2009-2012 an Irish-Danish knowledge exchange project<sup>10</sup> was conducted on a €180,000 budget, creating a project pool knowledge on energy conservation, efficiencies and options for renewable energies, sharing information and experience by creating energy groups on each of 6 islands, making study visits to include Samso, DK & Aran Islands.

The Irish partner was Comhar na n'Oileán, Árrain Mhór partner was the Árrain Mhór Energy Committee.

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<sup>9</sup>

<http://www.irishtimes.com/news/arranmore-has-500-dumped-cars-removed-1.918982>

<sup>10</sup> Dr Shirley Gallagher: *An Island's Perspective*, Smilegov Think Tank, September 4 2013

The project led to the Árrain Mhor Energy Plan 2012-2032, stating:

- there is a huge potential for renewable energy on the island
- it's possible to gather focused people
- with the creating of a vision, others could see beyond the horizon
- cooperative projects and sharing resources is the future
- shift in consciousness, business as usual is no longer an option

It was found that most islanders depend on oil fired central heating for space and hot water heating; that many houses still use inefficient open hearth fires; that there is room for improvement in insulation levels in nearly all island houses: that some houses have no insulation; that transport is exclusively oil based; and that traditional hand cut turf (peat) is still used by many houses.

Continuing from the IRDA project data and findings and including the ferry services, it is possible to create quite accurate data of Árrain Mhór's energy consumption 2015, including the energy used on ferry transports:

#### ENERGY CONSUMPTION

Coal	668 MWh
Agri diesel	2,088 MWh
Road diesel	251 MWh
Marine diesel	2,791 MWh
Peat briquettes	42 MWh
Bottled gas	42 MWh
Kerosene	3,424 MWh
Electricity	1,837 MWh
Sum of energy use	<b>11,141 MWh</b>
Per capita 514	21,675 kWh
728	15,310 kWh

#### EMISSIONS

Coal	166 t CO <sub>2</sub> e
Agri diesel	557 t CO <sub>2</sub> e
Road diesel	67 t CO <sub>2</sub> e
Marine diesel	745 t CO <sub>2</sub> e
Peat briquettes	15 t CO <sub>2</sub> e
Bottled gas	8 t CO <sub>2</sub> e
Kerosene	852 t CO <sub>2</sub> e
Electricity	1,345 t CO <sub>2</sub> e
Sum of emissions	<b>3,756 t CO<sub>2</sub>e</b>
Per capita 514	7,308 kg CO <sub>2</sub> e
728	5,162 kg CO <sub>2</sub> e

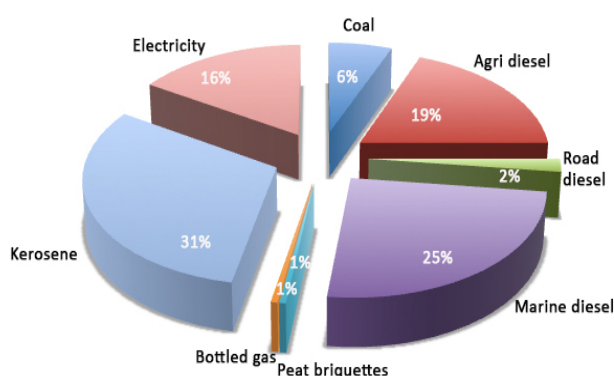
It may be interesting to know that the average Irish household emits about 8.1 tonnes of CO<sub>2</sub> according to Sustainable Energy Ireland (SEI)<sup>11</sup>. 4.8 tonnes of those CO<sub>2</sub>

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<sup>11</sup>

[http://www.seai.ie/News\\_Events/Press\\_Releases/2008/SEI\\_Report\\_Shows\\_Average\\_Irish\\_Household\\_Emitting\\_8.1\\_Tonnes\\_of\\_CO2.html#sthash.tsbuPwXC.dpuf](http://www.seai.ie/News_Events/Press_Releases/2008/SEI_Report_Shows_Average_Irish_Household_Emitting_8.1_Tonnes_of_CO2.html#sthash.tsbuPwXC.dpuf)

emissions are from direct fuel use with the remainder relating to upstream emissions from electricity usage.



*Diagram of total energy use on Árrain Mhór*

### **Energy production**

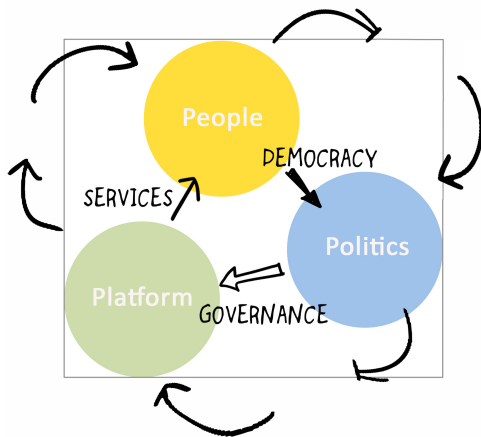
Almost all energy on Árrain Mhór is imported. Since 1956, Arranmore is connected to the mainland by a submarine cable from Rutland.

Some renewable energy heating technologies installed: heat pumps (areothermal and geothermal), 6 kW wind turbine and 11 solar panels for water heating.

## 4 Out of the box

If a small European island was ever in need of integrated development, it is Árrain Mhór. No isolated project, no single effort will make real change on the island. This is why this audit, originally intended at calculating energy use, describing emissions and pointing at renewable energy project ideas, goes out of the box.

Simply put, an island is a system with three interacting parts: (1) the people on the island; (2) politics, making the plans and hopes of people come real; and (3) the island in itself, the physical platform and its services to the people on it.



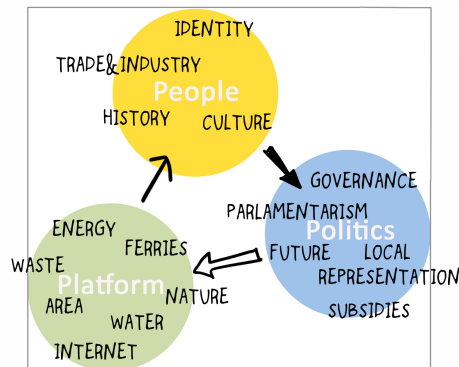
### Inside the box

Inside the box is the people side of things, the full-time inhabitants and the part-time ones, the visitors, the trades and businesses, music, literature and the identity of the islanders.

Inside the box is the governance side of things: taking care of the island according to the law and the promises made in the last elections following the parliamentary system.

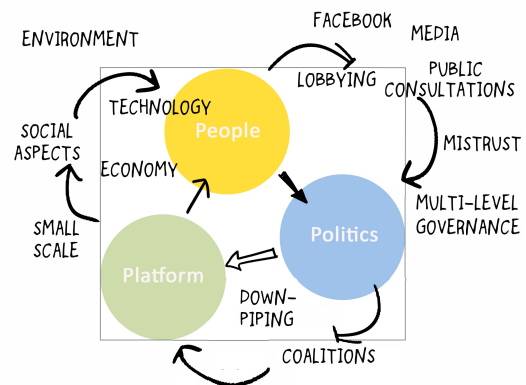
Inside the box is the infrastructure of the island: water pipes, electrical ca-

bles, wastewater treatment, dumps, jettys and ferries.



### Outside the box

Outside the box are movements and turbulence in our society that changes the relations between people and politics, between politics and the island platform, and between the platform and the people.



We are losing trust in our politicians, fewer people want to become one. Facebook and other social media is changing the way we interact with our leaders, so is media. There are more public consultations and a strong lobby in many issues. The levels of governance above a small island have never been so many and it is important to use new channels and

new ways of getting politicians to listen to the islands.

Politicians get our votes because we want something done, but then they go into coalitions and constellations where our intentions get lost. There is a tendency for down-piping on the mainland – to take care of one issue at a time, separating functions from each other – that serves an small island ill. Also budget negotiations, refugee problems and re-elections all disturb the political power to actually do something about the infrastructure. We need to be holistic and to see the whole island as a system.

The platform development has traditionally been about technology and economy – “ hard ” aspects. But nowadays “ soft “ aspects, social development, down-sizing, sustainable and environmental perspectives have to be taken into consideration, making it much more complicated to plan and build infrastructure that meets the demands of the inhabitants. We must get planning departments on the mainland understand that on small islands big is not better, speed is not always necessary, and small can be very beautiful.

### **Gleicher’s formula for change**

David Gleicher created the *Formula for Change* when working at Arthur D. Little in the early 1960s, and it was refined by Kathie Dannemiller in the 1980s. This formula provides a model to assess the relative strengths affecting the likely success of change programs in organisations or communities.

Three factors must be present for meaningful change to take place: **D** = Dissatisfaction with how things are now; **V** = Vision of what is possible; **F** = First, concrete steps that can be taken towards the vision; If the product of these three factors is greater than **R** = Resistance, then change is possible.

Because D, V, and F are multiplied, if any one is absent (zero) or low, then the product will be zero or low and therefore not capable of overcoming the resistance to change.<sup>12</sup>

### **Development**

Nicolas Loncles ends the brilliant, 200-page study of Árrain Mhór that has been cited many times in this report, by writing:

*“Development should not focus on reaching an equal quality of life with the Mainland, as asked by Comhdail Oilean na hEireann, because this objective is probably illusory. If many inhabitants acknowledged that bore-*

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<sup>12</sup>

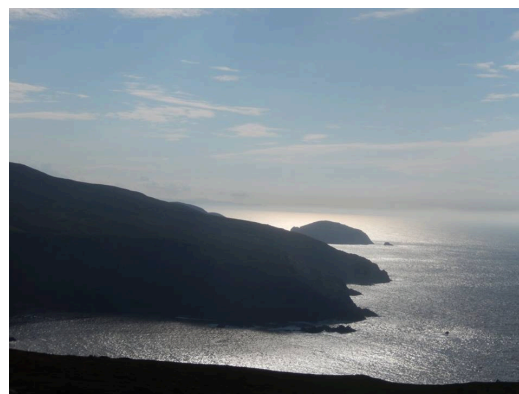
[https://en.wikipedia.org/wiki/Formula\\_for\\_change](https://en.wikipedia.org/wiki/Formula_for_change)



dom is often a concern, especially in winter, that living cost is higher, many think also that the quality of life is superior on the island. While improvements can be done, it is even more important to learn to compose with advantages and inconveniences, rather than to pursue an hypothetic levelling that can only be a source of frustrations.

Because Arranmore<sup>13</sup> is not a slow development territory, behind the times (are they any?), but more obviously than in many places, here tradition comes across modernity, sometimes confronted and often combined with more or less harmony. In simplification, urban influences and mentalities grow among the Arranmore community, and the rural characteristics are less obvious. These changes are judged sometimes with enthusiasm, sometimes with defiance and regrets by the islanders or visitors... because people feel that through these changes, the community loses parts of the spirit that tied them together.

To place careful attention on insuring balances between aspects of tradition and modernity, between the various functions of the island, and then to insure respect between the various social groups using the island, would help Arranmore to face its difficulties and to find a serener way of future. And to insure a long life to such original territories, responsibilities of their preservation must be entrusted to all persons and groups who, in a some way or an other, are attached to and participate to the lives of the Donegal islands.”



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<sup>13</sup> Loncle writes Arranmore but I have preferred to write Árrain Mhór in this report, following the advice of Seamus Bonner.

