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Article

Long-Term Change in Human Impact and Environmental Perceptions: A 40-Year Case Study of an Environment-Focused Non-Governmental Organization

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ABSTRACT: Non-governmental environmental organizations are diverse in scope, goals and doctrine, ranging from natural history societies to green parties. It was from the 1960s that they became widespread worldwide. To characterize a French NGO and assess the changing trends in its objectives over time, we have qualitatively and quantitatively analyzed the journal it has published without interruption for 40 years: 140 issues, 4500 pages, and almost 250 keywords. The initial scope of the NGO was focused on 'humans and nature': we do not protect the environment against humans but with humans, *i.e.*, at the same time as humans, which is the very definition of sustainable development, with its three-fold focus: nature, economy and social justice. The primary issues included recognizing water as a shared resource for all people, promoting sustainable agriculture and transportation (such as railways), advancing peace efforts, and protecting nature. This approach emphasizes a rigorous, evolving scientific perspective that goes beyond a focus on a few charismatic species ('deluxe biodiversity'), embracing biodiversity in its entirety. Over time, the discourse has kept track of the shifting priorities of most Green parties: less and less focused on nature (e.g., forests, ecosystems) and more and more on social issues (e.g., health, housing, transport). However, it differs in not focusing on the *idées fixes* of the Greens (e.g., rejection of civil nuclear power, GMOs).

Keywords: Ecology; Environment; Environmental NGOs; Forest; Green parties; Social justice; Water



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1. Introduction

Environmental movements (or environment-focused organizations), in the broad sense, have existed at least since the 19th century. But it was not until the 1960s that they became widespread, with a broad range of objectives [1]. Although many scientists working in the field of ecology are members of one or more environment-focused NGOs (Non-Governmental Organizations), the goals of these organizations are generally distinct from those of academic research.

The MNLE (Mouvement National de Lutte pour l'Environnement—National Movement for the Defence of the Environment), a French NGO, was founded in November 1981. Its journal, *Naturellement*, was launched a year later, in October 1982. The work of the MNLE and the publication of *Naturellement*, have continued without interruption ever since, even during the periods of confinement due to the COVID-19 pandemic in 2020–2021 [2,3]. In all, between October 1982 and June 2022, 140 issues have been published, amounting to a total of approximately 4500 pages [4].

Around 300 people participated in the founding congress of the MNLE in Nanterre (Paris). Among them, and the first leaders of this NGO, were several renowned academics, including Professors François Cosserat (physicist), René Nozeran (botanist and ecologist), Vincent Labeyrie (entomologist and ecologist), and Léon Schwarzenberg (doctor) [5].

Media produced by environmental movements has received little attention from media historians or historians studying environmental NGOs [6,7].

Here, we have analyzed this valuable source of information, the content of *Naturellement*, and its changing trends over time. Did these trends follow the changing concerns of the science of ecology? Are these changes in phase with the perceptions of several members of the MNLE who have kept track of it since its foundation, or almost ('long-term witnesses')? Does the focus of the MNLE's concerns parallel that of other environmental NGOs, including Green parties?

2. Materials and Methods

The number of pages published in each issue of *Naturellement* has increased over time (Table 1). The first issue (October 1982) had 8 pages in black and white, with a bit of green on the first page; N°127 (late 2017–early 2018) had 50 colour pages (Figure 1). The circulation of *Naturellement* has varied over time; unfortunately, the data archiving system is deficient, which is a common issue in environmental NGOs run by volunteers; a print run of 3000 paper copies was recorded, in addition to a digital version for 5 years.



Figure 1. (Left). Front page of the first issue of *Naturellement*, October 1982. The headlines read (top to bottom and left to right): ‘Cancer, (an environmental disease?)’, ‘*Naturellement*, national press conference’, ‘Dossier on forests’ and ‘Dead fish in the Rhone River’. (Right). The cover of N° 127 of *Naturellement*. The headline reads: ‘Water and climate change, state of the resource’.

Table 1. Progression of the average number of pages per issue and per year, in the MNLE journal, *Naturellement*, over 40 years.

	1982–1984 *	1985–1989	1990–1994	1995–1999	2000–2004	2005–2009	2010–2014	2015–2019	2020–2022 **
Pages/issue	10	17	34	32	30	32	42	50	51
Pages/year	38	81	102	97	109	113	141	140	152

* The first year is incomplete: the journal was launched in October. ** The last year is incomplete: the analyses ended in June.

In order to analyze the content of *Naturellement*, we established a list of 237 keywords (Table 2). One or two keywords were chosen for each page, representing one page or half a page, respectively. These keywords have been grouped into over 30 themes, e.g., Forests, Agriculture, Sustainable development, Human health, Protection of Nature, Waste. The grouping of keywords within a theme was not based upon a value judgment: e.g., Deforestation, Forest fire, and Reforestation was grouped within the theme ‘Forest,’ Garbage dumps and Waste recycling within ‘Waste,’ Industrial breeding of livestock, and Ecological farming (biological or organic farming) within the theme ‘Agriculture’. At first glance, this may seem surprising. However, although alternative groupings are possible, this seemed to us the least

unsatisfactory framework to analyse trends over the past 40 years: (i) it is the ‘problem/solution’ couple that measures the trend and not the boundary between the two; (ii) the boundary may have changed over time, and can therefore seem subjective from a present-day perspective.

Table 2. Change over time (% of the number of pages) in the themes covered in *Naturellement*. Only the main themes (and keywords) are indicated. In red are the 5 dominant themes per period. + <0.05% of the number of pages. The total number of pages is less than that shown in Table 1: certain pages are not considered here (e.g., cover, contents, advertisements).

Themes and Keywords	1980s	1990s	2000s	2010s	2020s
NATURE					
Biodiversity , fauna, flora	2%	9%	6%	3%	3%
Ecology , environmental chemistry, evolution, geography, paleoecology, physical parameters of the environment, scientific research	3%	3%	2%	3%	+
Natural environment , astronomy, coastal erosion, earthquakes, geology, landscape, seascape	1%	2%	4%	6%	1%
Rivers , dams, fish ladders, sand mining, springs	4%	2%	2%	1%	3%
Forest , deforestation, forest fire, logging, pests, reforestation, silviculture	16%	2%	2%	1%	+
Floods , damming, hurricanes, sea level, storms, tsunamis	2%	1%	1%	1%	+
Total ‘Nature’	29%	18%	16%	14%	8%
HUMAN IMPACT					
Pollution , acid rain, air pollution, asbestos, detergents, disturbances, eutrophication, harmful blooms, heavy metals, lead, nitrates, odours, oil spills, PCBs, pesticides, phosphates, water pollution	18%	5%	6%	2%	1%
Waste , incinerators, landfills, methanization, packaging, recycling, waste management	6%	18%	4%	3%	1%
Noise	2%	1%	1%	-	+
Invasive species , biological control, locusts	1%	1%	1%	+	-
Hunting , fishing, overfishing (sea)	+	+	1%	1%	-
Climate change , climatology, CO ₂ , desertification, drought, greenhouse gases, heat waves, meteorology, ozone layer	3%	1%	4%	4%	4%
Total ‘Human impact’	31%	26%	16%	11%	7%
HUMAN ACTIVITIES					
Tourism , boating, overcrowding, sport, winter sports	1%	1%	+	1%	1%
Agriculture , aquaculture, beekeeping, herbicides, industrial breeding, livestock diseases, organic farming, pastoralism, protected designation of origin (AOC), soil pollution	2%	1%	6%	7%	5%
Cities , architecture, gentrification, green spaces, housing, living environment, speculation, town planning, uncontrolled urbanisation, urbanisation, villages	3%	3%	2%	5%	9%
Transport , air transport, automobile, bicycle, canals, high-speed trains, highways, navigation, ports, public transport, rail transport, river transport, tunnels	4%	9%	12%	12%	11%
Social issues , associations, capitalism, consultation, democracy, demography, NIMBY, pacifism, police, political ecology, politics, poverty, public services, religion, social justice, sociology, solidarity, taxes, trade unionism, war, women (rights)	5%	6%	5%	10%	12%
Education , art, books, cinema, culture, gastronomy, history, literature, leisure, media, museums, photography, poetry, social networks, television	3%	3%	2%	4%	2%
Human health , bacteria, disability, environmental diseases, occupational diseases, toxicity, viruses, world hunger	3%	2%	1%	6%	9%
Total ‘Human activities’	20%	26%	29%	45%	49%
MANAGEMENT					
Water , drinking water, drought (climate), water management, water resource	+	4%	3%	7%	7%
Wastewater , depollution, dredging sludge, water purification, WWTP (wastewater treatment plant) sludge	1%	2%	1%	1%	+
Renewable energies , electricity, energy saving, geothermal energy, hydroelectric energy, solar energy, wind power, wood	2%	3%	5%	5%	3%
Nuclear power , nuclear risk, nuclear tests, nuclear waste, radioactive pollution, radioactivity	5%	3%	5%	3%	1%
Sustainable development , circular economy, crafts, common good, consumerism, economy, employment, fair trade, industry, international agreements, globalisation, multinationals, productivism	2%	1%	8%	6%	3%
Land use planning , impact studies, industrial accidents, precautionary principle, regions, risks, safety, transport of dangerous products	2%	1%	4%	2%	16%
Biotechnology , biofuels, GMOs (Genetically Modified Organisms)	+	4%	3%	1%	-
Law , environmental law, maritime law, ecological taxation, legislation	2%	1%	2%	1%	+
Europe , European directives, European politics	+	+	1%	1%	+
Protection of nature , Antarctica, artificial reefs, beaches, coral reefs, dunes, estuaries, extinct species, humans within nature, lagoons, peatlands, protected areas, reintroductions, restoration, species protection, threatened species,	4%	9%	5%	3%	4%
Total ‘Management’	18%	29%	36%	29%	35%
Total number of pages	490	884	1017	1352	407

To measure the respective importance of the different keywords (and then the themes) in a given year, the unit is, therefore, the page and not the number of articles (articles can be between half a page and 6 pages) (Table 3).

Table 3. A fictitious example of the quantification of keywords in a set of 7 pages with 4 articles.

Articles	Pages	Keywords	Quantification
Article 1	Page N° 1	A	1 A
	Page N° 2	A, B	0.5 A, 0.5 B
	Page N° 3	A, C	0.5 A, 0.5 C
Article 2	Page N° 4	C	1 C
Article 3	Page N° 5	B, D	0.5 B, 0.5 D
	Page N° 6	B	1 B
Article 4	Page N° 7	A, E	0.5 A, 0.5 E
Total	7 pages	A, B, C, D and E	2.5 A, 2.0 B, 1.5 C, 0.5 D, 0.5 E

The analysis of the content of *Naturellement* was compared with the memories of three witnesses who have followed the MNLE since its foundation, or almost (Brigitte Berland, Jean-Claude Cheinet and Christian Pellicani). They were asked to indicate for each time period the three major themes of the MNLE. In order to avoid their responses being influenced by the analysis of the content of *Naturellement*, the interviews took place before the analysis started.

The 237 keywords used to analyze the content of *Naturellement* were employed to determine the trend in the number of articles published in world scientific journals. For each time period and each theme, the number of published articles accessible on Google Scholar was recorded. A *t*-test on the slope was conducted for each theme to extract a trend statistically.

3. Results and Discussion

3.1. An Original Environment-Focused NGO

There are many types of environment-focused non-governmental organizations (NGOs): there is a wide diversity in their scope, goals and doctrine. Their delimitations are somewhat arbitrary, with indistinct edges and numerous intermediaries connecting them [1,8].

Some NGOs are natural history societies based on a given taxon or with a more general focus, involving threats to particular areas or species, such as the British Phycological Society and the Société Linnéenne de Provence, respectively [8]. They play a very useful role at a time when academic research is abandoning certain areas of ‘classical’ natural history and taxonomy, wrongly judged to be outdated (see, e.g., [9–14]). NGOs focused on one taxon obviously have a positive role in the protection and management of species of this taxon, but they sometimes behave like lobbies and implement unnecessary measures to favour their beloved taxon and enhance its abundance artificially; failure to take into account the impact of enhancing one species on other compartments of an ecosystem is the opposite of ecosystem-based management. For example, a bat protection NGO has asked, sometimes successfully, the Port-Cros National Park (Provence, France) to build shelters and drinking troughs for non-threatened (according to the IUCN Red List) bat species; when they were asked if this did not harm other nocturnal consumers of insects, including a truly endangered species in Provence, the frog *Discoglossus sardus*, the answer was confused. It reflected the fact that bat lovers had not even considered the question [15,16]. In addition, the ecological approach of some of these NGOs is often outdated, dating back to the mid-20th century.

Other NGOs act primarily at the international level, such as IUCN (International Union for Conservation of Nature), WWF (World Wildlife Fund) and Greenpeace. Although their objectives are theoretically broad, they often focus primarily on high-profile species with strong public appeal, such as birds, mammals, and turtles, which easily garner widespread support. The focus on this kind of ‘deluxe diversity’ comes at the expense of the ‘obscure diversity,’ with species that play a more important role in enabling the ecosystem functioning and providing ecosystem services and goods [16–21]. This trend has also been called ‘Walt Disney effect’ by Bianchi and Morri [22]. As a result, there is a substantial bias with regard to the choice of taxa for which research funding is made available, a bias that is excessive when it comes to funding conservation, with an overwhelming dominance of birds and mammals [23,24].

Many NGOs were created to respond to local environmental problems. For example, in Corsica, Tavignanu Vivu opposed the creation of a garbage dump likely to pollute the aquifer [4]. They are often ephemeral. Some of these NGOs, however, privileged private enjoyment of nature rather than real environmental objectives. They can thus oppose a

development project which will benefit thousands of people but which spoils the landscape enjoyed by a resident; this is the famous NIMBY syndrome (Not In My Back Yard) [25–28].

Finally, Green parties, which base their ideology on ecology, are also worth mentioning here. Their role has been crucial in getting governments to address environmental issues worldwide. However, their references to ecology often date from the mid-20th century. In a way, this is an ecological perspective based on a quasi-religious approach. However, this is subconscious: the concepts of ecology from the 1950s constitute a sort of sacred book, like the Bible or the Koran, which is immutable [18,19,29,30]. Their take on biodiversity has remained a question of ‘how many species?’ and ‘the more species, the better’, whereas today it is generally considered that the number of species is the worst descriptor of biodiversity [31,32]. Furthermore, the Greens are focused on a few emblematic issues, such as opposition to civilian nuclear power, GMOs (Genetically Modified Organisms) and diesel fuel (without critical analysis). At the same time, they sometimes neglect other environmental issues.

A common point among many environmental NGOs is ‘fixism’. Ideal nature is in perfect equilibrium and stable. All change, real or supposed, is due to humans and must be fought against. However, scientific ecologists have long pointed out that an ecosystem is not stable [33,34]. As Dayton [33] wrote, ‘*No community is stable in the sense that it does not change*’. Furthermore, ‘*Counterintuitively, constant change—the dynamic state—is the source of long-term stability in communities; try to block a change in the short term, and you ensure inimical change in the long term*’ [35].

The original feature of the MNLE, as an environmental NGO, is that it is based on science (see below), that it acknowledges that science does not deliver definitive truths but evolves over time (unlike revealed religions), and that it does not oppose man to nature, but rather considers man with nature and within nature (see below).

3.2. Science at the Core of the Environmentalist Doctrine

Unlike the discourse of many environmental NGOs, *Naturellement*, the MNLE magazine, reflects a careful pursuit of scientific rigor. Certain concepts, now classic in the academic sphere, were highlighted very early in *Naturellement*. Frequent errors were corrected at the risk of surprising some readers accustomed to an oversimplified or even simplistic discourse. Some examples follow.

From the 1980s, *Naturellement* discussed global warming and the responsibility for greenhouse gases [36]. The concept of sustainable development was used by the MNLE, before and after the Earth Summit (United Nations Conference on Environment and Development) held in Rio de Janeiro (Brazil) in June 1992, in which it participated [4,37–40].

In a remarkable article on the forest, published in *Naturellement*, Vincent Labeyrie recalled that ‘*With few exceptions, the forest does not produce more oxygen than it consumes. Has it not been written that forests are the lungs of our planet and provide the oxygen essential to our breathing? And yet, it is untrue*’ (Labeyrie [41]; translated from French). Of course, Vincent Labeyrie explained in detail why a forest in equilibrium does not produce oxygen: the decomposition of dead leaves and wood consumes as much oxygen as is produced by photosynthesis. For an environmental NGO, it was bold to challenge a conventional cornerstone of scientific communication and the prevailing views shared by most other NGOs.

Unlike most environmental NGOs, which focus on the protection of a few species (for example, birds or bats), the MNLE and *Naturellement* have dared to speak of an ecosystem-based approach. Robert Barbault wrote (in [42]): ‘*There is no point in wanting to preserve this or that species. It is even a rather perverse approach, which does not take into account the reality of biodiversity. The ecosystems must be considered as a whole, and not the elements that compose them.*’ And Brigitte Berland added: ‘*An ecosystem-based approach has several advantages over a species-centred approach, by allowing natural communities to continue to evolve, and by conserving a greater number of species (...)*’ (in [42]; translated from French).

More recently, *Naturellement* dared to publish an article [43] explaining that the domestic honeybee *Apis mellifera* is only one of the pollinators and by no means the best and that it is the diversity of pollinators (several thousand wild species) and not the domestic honeybee, which ensures pollination. Furthermore, the current decline in domestic bees was due more to bee parasites introduced by beekeepers, such as *Varroa destructor*, than to pesticides used by industrial agriculture, which, of course, does not mean that these pesticides would not affect the environment, on domestic bees and humans [43–47]. This message was courageous because it challenged the scientifically biased views held by most environmental NGOs.

3.3. Taking Humans into Account

The motto of the MNLE is ‘Humans and Nature’. This means that we do not protect the environment against humans but with humans, *i.e.*, at the same time as humans [4]. This is the definition of sustainable development, with its threefold focus: nature, economy and social justice [48,49].

Analysis of the content of *Naturellement* shows the importance of four issues linked to humans: transport, agriculture, water and peace. On these points, the MNLE position agrees with that of political ecologists (the Greens).

The question of transport is important because transport contributes to greenhouse gas emissions, and transport availability contributes to human well-being. The MNLE has always favoured railways, waterways and public transport over private cars, trucks and planes [50,51] (Figure 2).

Many articles in *Naturellement* have dealt with agriculture. The position was consistent with that of most environmental NGOs. Traditional agriculture would be more efficient than industrial agriculture, which consumes large amounts of water and pesticides to produce corn often intended for livestock feed. Faced with global warming and drought, the construction of reservoirs (in French ‘*bassines*’) to store water has been severely criticized. These reservoirs would not solve the drought problem but aggravate it, even becoming one of the causes of drought [4].

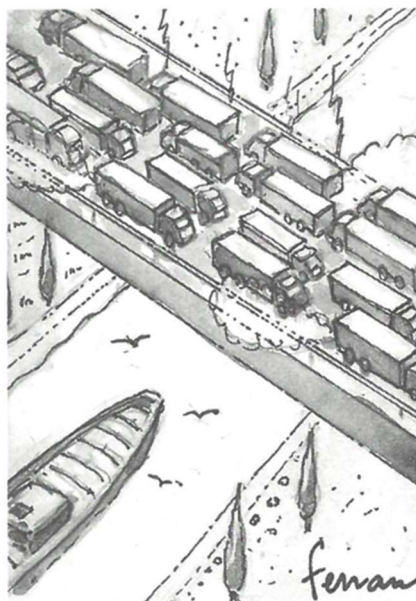


Figure 2. A cartoon by Claude Ferran, in *Naturellement*, comparing road and waterway transport: one barge can replace a hundred trucks. It illustrates an article in favour of waterways [52].

The MNLE and its magazine *Naturellement* have extensively featured water management [3,4]. According to the MNLE and many environmental NGOs, water is a common good for the people of the Earth. It should not be privatized or diverted for unsustainable agricultural uses (see above). In parallel with the World Water Forums (WWFs), organized by governments and by water multinationals suspected of seeking to privatize water, alternative forums were organized simultaneously in the same cities. The Alternative World Water Forums (AWWFs) were counter-events arising from alternative and anti-capitalist movements that brought together civil society actors. During the 2014 WWF in Marseilles (southern France), the MNLE was an active co-organizer of the AWWF counter-event [53,54].

Peace has been the focus of the MNLE’s combats. It shares this priority with ‘green’ NGOs, but not with most environmental NGOs, focused on other topics and issues. The MNLE is a member of ICAN (International Campaign to Abolish Nuclear Weapons), and as such shared the 2017 Nobel Peace Prize [55,56].

3.4. A Discourse That Has Changed over Time

Analysis of the content of *Naturellement* (number of pages) shows that certain themes have lost importance over time, that others have gained importance, and finally, that certain themes have always been neglected (Table 2).

Among the themes that have regressed, the most striking case is that of the ‘Forest’ theme (including fires). In the 1980s, it represented 16% of pages, declining abruptly, becoming negligible in the 2020s. The initial importance of the forest theme can be explained by the interest of Suzanne Pommiers, one of the founders of the MNLE, for the forest. A

workshop devoted to the forest, with more than 200 participants, was organized in October 1983. It should be emphasized that this interest in the forest in the 1980s was often seen through the eyes of foresters, focused on its exploitation. The forest was, for them, just a source of wood, sometimes from plantations, threatened by pests (insects, fungi); according to these foresters, dead wood should not be left in place [57]. Fortunately, Labeyrie [41] pointed out that dead wood is an essential element in the functioning of the forest ecosystem, both as a source of nutrients, as a food for insects, and as the basis of food webs. The decline of the theme ‘Forest’ in *Naturellement* does not fit the world literature trend, which shows an increase, although a non-significant one (Table 4). At the global scale, deforestation and fire were and still are a major concern [58,59]. The reasons for this mismatch between *Naturellement* and the world literature could be that, in Western Europe and especially in France, forests are steadily spreading, despite forest fires, and have now reached their largest surface area for several centuries [60,61]. In addition, France has an efficient policy of prohibiting construction outside urban cores (dispersed habitat; in French, ‘mitage’). Without such a policy, these scattered developments significantly exacerbate the severity of forest fires in countries like Greece and Portugal. As firefighters work to protect isolated homes, the fires can quickly spiral out of control [62,63].

Table 4. Change over time, in the world literature (number of articles), in the themes covered in *Naturellement*. Within themes, keywords are the same as in Table 2. In green, significant increase. ns: not significant.

Themes	1980s	1990s	2000s	2010s	2020s	t test	Trend	Significant ($p = 0.5$) if $t > 2.353$
NATURE								
Biodiversity	0.61%	0.60%	1.49%	3.17%	1.67%	1.72	increase	ns
Ecology	86.80%	89.26%	82.89%	59.02%	65.37%	−2.78	decrease	ns
Natural environment	0.55%	0.40%	1.35%	3.19%	2.61%	3.22	increase	yes
Rivers	0.06%	0.03%	0.04%	0.11%	0.22%	2.41	increase	yes
Forest	0.85%	0.64%	1.97%	5.06%	2.33%	1.52	increase	ns
Floods	1.13%	1.02%	1.68%	3.40%	1.79%	1.35	increase	ns
Total ‘Nature’	90.01%	91.96%	89.41%	73.94%	74.00%	−3.09	decrease	ns
HUMAN IMPACT								
Pollution	0.16%	0.12%	0.14%	0.87%	1.00%	3.16	increase	yes
Waste	0.88%	0.51%	0.25%	0.35%	0.88%	−0.15	decrease	ns
Noise	0.11%	0.09%	0.08%	0.29%	0.77%	2.47	increase	yes
Invasive species	0.41%	0.50%	1.03%	3.55%	2.29%	2.32	increase	ns
Hunting	0.39%	0.22%	0.24%	0.32%	0.87%	1.39	increase	ns
Climate change	0.26%	0.18%	0.18%	0.34%	0.81%	2.00	increase	ns
Total ‘Human impact’	2.21%	1.62%	1.92%	5.71%	6.63%	2.99	increase	yes
HUMAN ACTIVITIES								
Tourism	0.22%	0.22%	1.19%	4.71%	2.04%	1.66	increase	ns
Agriculture	0.01%	0.01%	0.02%	0.06%	0.14%	3.29	increase	yes
Cities	0.05%	0.04%	0.05%	0.18%	0.36%	3.07	increase	yes
Transport	0.50%	0.42%	0.51%	0.56%	0.76%	2.46	increase	yes
Social life	0.93%	0.53%	1.07%	1.89%	1.00%	0.94	increase	ns
Education	1.34%	2.15%	3.46%	8.71%	7.30%	3.59	increase	yes
Human health	0.97%	0.57%	0.28%	0.33%	0.75%	−0.69	decrease	ns
Total ‘Human activities’	4.03%	3.95%	6.59%	16.45%	12.34%	2.61	increase	yes
MANAGEMENT								
Water	1.47%	0.73%	0.27%	0.32%	0.68%	−1.01	decrease	ns
Wastewater	0.05%	0.04%	0.05%	0.29%	0.79%	2.76	increase	yes
Renewable energies	0.17%	0.10%	0.14%	0.42%	0.80%	2.82	increase	yes
Nuclear power	0.22%	0.13%	0.11%	0.30%	0.72%	1.92	increase	ns
Sustainable development	0.29%	0.31%	0.34%	0.40%	1.09%	2.19	increase	ns
Land use planning	0.04%	0.04%	0.05%	0.11%	0.24%	3.03	increase	yes
Biotechnology	0.07%	0.14%	0.24%	0.37%	0.82%	4.07	increase	yes
Law	0.64%	0.45%	0.39%	0.76%	0.90%	1.36	increase	ns
Europe	0.79%	0.50%	0.45%	0.84%	0.81%	0.53	increase	ns
Protection of nature	0.02%	0.02%	0.03%	0.10%	0.19%	3.53	increase	yes
Total ‘management’	3.76%	2.47%	2.08%	3.90%	7.03%	1.47	increase	ns
Total number of articles in Google scholar	1,221,198	3,327,262	6,792,100	5,557,010	2,233,440			

The themes ‘Rivers’ and ‘Floods’ have slightly declined in *Naturellement*, since the 1980s (Table 2). This is in contradiction with the trend of world literature (Table 4). Public perception and the scientific literature attribute a greater number of extreme events, including severe flooding, to global warming. As far as Western Europe is concerned, an increase in flood severity is however not confirmed. Rather, the maximum occurred several centuries ago, and the

increase in the impact of flooding on humans is generally due to growing urbanization in the floodplain of streams and rivers [63–68].

Overall, the themes related to ‘Nature’ (including Ecology, Forest and Floods) declined in *Naturellement* from 29% in the 1980s to 8% in the early 2020s (Table 2).

The theme ‘Pollution’ abruptly declined in *Naturellement*, from 18% (1980s) to 1% (2020s) (Table 2). This is unsurprising. Within the European Union (EU), thanks to binding directives, States and cities have been forced to build efficient wastewater treatment plants. For example, the opposition of elected officials in Marseilles was broken by the imposition of very heavy financial sanctions from the EU. At the same time, industrial discharges have been significantly reduced. Today, the rivers are no longer sewers, and you can swim without risk from the beaches at Marseilles [4,19,69]. Does that mean that pollution is no longer a problem? This is obviously not the case. Other pollutants, previously present but neglected, such as microplastics and pharmaceutical products, must now be considered (e.g. [70–72]). The decline of the theme ‘Pollution’ in *Naturellement* is completely opposite to its significant increase in the world literature (Table 4). Two reasons can be put forward to explain this contradiction. (i) The situation in the EU does not represent the global situation. (ii) There is a sort of research lobby on pollution; research institutes have sophisticated devices for measuring pollutants (e.g., trace metals, organic pollutants) and it is tempting to use them. But if pollution, at the doses observed in nature, can be responsible for stress and even mortality for the individual, it often has no impact on the population and, in some cases, at the ecosystem level [19]. Contrary to the perception of the public, stress (cold, heat, wind, fear, love, etc.), materialized by the production of stress enzymes, is often beneficial for the individual and even necessary for its longevity; this benefit is called hormesis [73].

The decline of the theme ‘Nuclear power’, from 5% to 1%, in *Naturellement* is surprising, given that the MNLE has always been a supporter of civil nuclear power, considering it as an acceptable risk (Table 2) [74,75]. This support constitutes a major difference compared to almost all other environmental NGOs worldwide [76]. Nuclear power is not popular anywhere; the Chernobyl and Fukushima disasters induced a real shift against nuclear power in several countries. In Italy, negative opinions reached 74% after the Chernobyl disaster; in France, however, negative opinions have never been in the majority, fluctuating between 17 and 45% [77]. The Greens’ rejection of nuclear power was originally based on solid scientific arguments, but failure to take into account changes in technology, risks and issues (including climate change) can give the impression of a certain ideological dogmatism [78–80]. How can we explain the decline of the theme ‘Nuclear power’ in *Naturellement*? Perhaps the members of the MNLE were led by the dominant discourse (the doxa), that of the Greens.

Overall, the themes related to ‘Human impact’ sharply declined in *Naturellement* from the 1980s (31%) to the 2020s (7%): Pollution, Waste, Noise, Invasive species, Hunting and Climate change. In contrast, themes related to ‘Human activities’ strongly increased, from 20% to 49%: Agriculture, Cities, Transport, Social issues (e.g., democracy, pacifism, poverty, social justice, solidarity and women’s rights) and Human health. The same occurred with the themes related to ‘Management’, from 18 to 35%, mainly Water (drinking water, drought, water management and water resource) and Land use planning (Table 2). This is consistent with the trend in the world literature (Table 4). This is also consistent with the trend of the Green parties’ ideology. Green parties initially relied on volunteers and activists, focusing mainly on environmental concerns. Subsequently, the desire to increase support and electoral acceptability has driven changes in their methods, which have become more ‘professionalized’, and in their ideology [76,81]. A political ideology is a set of political concepts or ideas related to each other [82]. Although it is more implicit than explicitly admitted, the unspoken message could have been: ‘We have been too environmental; now, let’s be social’ [76]. Green party ideology shifted to respect of others (anti-racism, refugees, disabled people, women), tolerance, social justice, abolishing unemployment, and participatory democracy [76,83,84]. In this way, the ideology of the MNLE has followed trends in the Greens’ ideology.

Four principles guide most Green parties worldwide [84]. (i) Ecological wisdom reflects an environmental ethic: human responsibility for sustaining the natural world and the necessity of doing this to continue benefitting from the services nature provides to humans. (ii) Social responsibility emphasises the fair distribution of social and natural resources. (iii) Appropriate decision-making highlights the need for an inclusive, participatory and democratic decision-making basis. (iv) The non-violence principle.

‘Protection of nature’ has never been a major theme in *Naturellement*, fluctuating between 3 and 5%, with a peak (9%) in the 1990s (Table 2). This contrasts with its significant increase in the world literature (Table 4) but is consistent with the trend observed in Green parties (see above).

The theme ‘Europe’ has always been negligible in *Naturellement*. This is very surprising, as European Union (EU) directives have played a paramount role in protecting species and natural habitats and improving water quality. These

directives were imposed on sometimes reluctant States (e.g., France) and local elected officials [19,69]. This limited reference to the EU contrasts with the pro-European commitment of the Green parties of the EU [85–88].

3.5. Possible Biases

Considering only one or two keywords per page of *Naturellement* can mean that certain keywords, which appear frequently, but almost always below the second rank, do not appear and their importance may thus be underestimated.

The content of *Naturellement* may not reflect all the activities and concerns of the MNLE. Other indicators could have been congresses (every three years) and university summer schools (every year). Unfortunately, there are no precise records of all these events; in some cases, reports were never written or have been lost. This is common in NGOs relying on volunteers and activists, who may not properly manage their archives. This further underlines the importance of a printed journal, widely distributed and kept in libraries, even in the internet and digital age.

The memories of the ‘long-term witnesses’ to the history of the MNLE (Table 5) are generally a poor reflection of the quantitative analysis of *Naturellement*, with some obvious inconsistencies; for example, a witness cited ‘Europe’ and ‘Law’ as major themes, while their weight was negligible in *Naturellement*; another witness cited ‘Biodiversity’ in the recent period (2000s and 2010s), while it peaked in *Naturellement* in the 1990s and subsequently declined (Table 2). Moreover, the memories of the three long-term witnesses sharply differ from each other (Table 6). Does this reflect a bias in the content of *Naturellement*, or the fragility of human memory? The concept of a shifting baseline, or historical amnesia, has been developed by Pauly [89]; total oblivion occurs after 50 years, approximately two human generations [90–95]. Partial oblivion may have occurred after a few decades, the present influencing the memory of the 1980s and 1990s.

Table 5. The three main themes, per time period, according to the ‘long-term witnesses’ (Brigitte Berland, Jean-Claude Cheinet and Christian Pellicani) and our quantitative analysis of the content of *Naturellement* (see Table 2).

Period	Brigitte Berland	Jean-Claude Cheinet	Christian Pellicani	<i>Naturellement</i>
1980s	Nuclear power	Forest	Cities	Forest
	Social issues	Natural environment	Sustainable development	Pollution
	Transport	Sustainable development	Transport	Waste
1990s	Water	Land use planning	Cities	Biodiversity
	Pollution	Pollution	Forest	Nature protection
	Nature protection	Sustainable development	Land use planning	Waste
2000s	Biodiversity	Pollution	Cities	Pollution
	Renewable energies	Sustainable development	Noise	Sustainable development
	Sustainable development	Water	Pollution	Transport
2010s	Biodiversity	Land use planning	Europe	Social issues
	Transport	Social issues	Law	Transport
	Climate change	Sustainable development	Water	Water

Table 6. Percentage of similarity between the ‘long-term witnesses’ and *Naturellement* main themes (see Table 5).

	Brigitte Berland	Jean-Claude Cheinet	Christian Pellicani
Jean-Claude Cheinet	17%	-	-
Christian Pellicani	8%	25%	-
<i>Naturellement</i>	23%	33%	8%

3.6. Are There Any Similar Analyses of an Environment-Focused NGO over Time?

Others than us have undoubtedly tried to tell the story of the changing trends in an NGO’s priorities over time. But many of these studies may be gray literature written in languages other than English. Despite extensive research, we only found one, that of Demesy [7].

In fact, Demesy’s study is not really comparable to ours. The author studied a French journal, *La Hulotte*, launched in 1972 and devoted to fauna, flora and nature for almost 50 years. This journal does not express the interests of an environment-focused NGO, but of a passionate amateur naturalist, Pierre Déomb. Its style and presentation are original, somewhere between a scientific journal, a literary work and a comic. Because of his articles’ high quality and popularity, his journal has been highly successful, with thousands or tens of thousands of readers. Demesy’s study does not concern the content of *La Hulotte*, but rather the perception its readers have of it, the assimilation of its content by the general public and its impact on other media (written press, radio and television); this impact has always been high, peaking between 1985 and 1997 [7].

4. Conclusions

Environmental NGOs do not constitute a homogeneous corpus: natural history societies, international environmental organizations, Green parties, etc. Some of them may be open to criticism, acting as taxonomical lobbies, sometimes with a negative impact on the protection of nature, or based upon an outdated (1950s–1960s) vision of ecology.

Within this context, the MNLE, a French NGO, can be characterized by: (i) a high-quality scientific approach, taking into account the fact that science evolves over time; (ii) an ecosystem-based rather than a species-by-species approach to nature; (iii) considering nature with man, rather than nature without man; and (iv) being interested in the human environment, such as housing, transportation, health and quality of life. Furthermore, unlike the Greens, the MNLE has avoided becoming a political party; according to the MNLE, it is within existing political parties that the environmental dimension must be taken into account.

The analysis of environmental NGOs is often qualitative, based on surveys and the study of the texts (press releases, press conferences, statutes, etc.) that they produce (e.g., [8,96]). Quantitative analyses are much rarer. Thanks to the uninterrupted publication, for 40 years, of a journal (140 issues), the MNLE has offered us the opportunity for an accurate and quantitative analysis of its concerns and their changes over time.

The acceptance of civil nuclear power constitutes an original aspect of the MNLE compared to most environmental NGOs, particularly the Greens. On the other hand, the MNLE has been completely in phase with the Green parties, abandoning most of the initial naturalist objectives (e.g., biodiversity, protected areas, forest) in favour of societal themes (e.g., democracy, social justice, peace, water as a common good) and management. Though it may be a wild exaggeration, a man within nature and with nature has become man without nature. These trends are generally inconsistent with those found in the world's scientific literature.

This development is regrettable. Between Green parties focused on societal problems and a few dogmas (e.g., opposition to civil nuclear power and GMOs) and NGOs focused on natural habitats or taxonomic groups (e.g., birds, bats, marine mammals), there must be an ecosystem-based, integrative approach, including humans. This was the motto of the MNLE when it was launched: 'Humans and nature'.

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Author Contributions

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