

*Sustainably Flourishing: A Case Study of the Aeolian Water Crisis*

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**Abstract**

This presentation illustrates the role of the concept of flourishing as it moves toward sustainability by examining a theoretical case study of Lipari, one of the Aeolian Islands. Challenged by a lack of potable water, Lipari provides a tangible model for the interconnectivity of community agency and sustainable issues. This presentation examines the leading qualities associated with a flourishing society to suggest actions that could be most effective in shifting the islands from an unsustainable water system to a sustainably flourishing one. Using the framework of complexity, this presentation integrates a variety of fields such as ecology, economics, public policy, and sociology in developing a more comprehensive definition of the concept of sustainable flourishing.

Keywords: Flourishing, Sustainability, Aeolian Islands, Water, Complexity, Sociology, Transdisciplinary

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## Introduction

The Aeolian Islands of Italy (located in the Tyrrhenian sea) provide us with an excellent opportunity to examine and explore environmental issues that threaten this small corner of the world. Not only will this study help develop an understanding of complex shifts that will lead to a more sustainably flourishing society, but it will also allow for the examination of the interconnections among the most challenging issues on the islands. My intention is to provide us with deeper appreciation of the requirements for constructing a sustainably flourishing society.

For Lipari and her sister islands, water supply is one of the most significant needs of natural resources. As Longo and Baker (2014) correctly argue, “in the modern era, ecological degradation has become a genuine threat to humans, other species and the ecosystems they rely upon” (p. 341). In the case of the Aeolian Islands, the contractual privatization of water has placed the Aeolians as victims with little agency. Lipari’s economy reliant upon tourism creates an additional set of pressures, not only on the infrastructures of the water system; but also by pitting the community against its only source of income.

This study offers the following definition for “sustainably flourishing”: to be better off than now, in a way that promotes positive collaboration among self, community, and nature. In so doing, the term *sustainably flourishing* is intentional as it captures a state in which humans are better off, but not at the expense of the environment, as has often been the case in the industrial past.

A set of general qualities emerge from the research on sustainably flourishing communities, namely that these communities:

- Establish a shared vision that promotes community agency
- Promote a systemic shift in thinking by both members of the community and community as a whole
- Build community support over individual gain
- Ensure that the environment and community improve
- Develop policymaking from within the community, not outside (see Roe, 2017).

Taken together, these qualities help to frame complex problems and provide a structure for their analysis. In the case of the Aeolian Islands, and namely Lipari, the abovementioned definition and its associated qualities, show that the islands’ water crisis is a clear indication that they are not flourishing. Living on an island, while a unique opportunity, is constantly challenged by the needs of those living there. This is further complicated by the intense demands of tourists, who are there only a few months during the year, but still aggravate the problem in many ways.

In order to develop connections between the qualities of flourishing as determined through the literature and the current water issues facing the island, I will begin by exploring the water issues unique to the Aeolian Islands, and even more specifically to Lipari.

## ▪ A Brief Overview of the Complex Water Crisis: Four Basic Problems

Having been to the islands, it is clear that tourists expect to have access to clean water. However, in countless conversations with my island community of friends, nothing could be farther from the truth. There are four categories of issues with the water supply that are specific to the islands: insufficient quantity, potability, adversarial relationships between locals and tourists, and water as transportation. The challenge of sustainable water systems is a true Gordian knot. If we are to understand the complexity of the water issues that the Aeolian Islands face, we must first examine them both individually and relationally, so that we can better understand them holistically. This will allow us to understand the complex interplay between the various factors so that we can move more realistically toward a sustainably flourishing future (Gembillo & Anselmo, 2013).

### Insufficient Quantity

The first issue is the significant gap that exists between what is used and what the island actually can provide. In 700 CE, the bishops of the region built the very first cisterns for holding water as a result of an already growing need for more water. Through private contracts negotiated by the city council of Lipari, water was shipped to the island in large barrels that were then moved about the island by donkey. Large cisterns were constructed to hold the water procured through private contracts along with rainwater in Canetto and Acquacalda during this period. In the 15th century, the castle on the island of Lipari was constructed with an even larger cistern. As Lipari grew, the water supply continued to be insufficient to meet the needs of the city; and over time it dried up (Archivio Storico Eoliano, n.d.). Atop Monte Sant'Angelo, the highest peak of the island of Lipari, is an antiquated water collection system. Using natural physics, water was collected in large cisterns at the top of the mountain during the winter and distributed to the towns (Ristuccia, 2015). However, this system was abandoned in the 1980s, according to a conversation with the vice mayor (G. Orto Vice Mayor, personal communication, January, 2017). In its current state, one sees that the site remains intact, but neglected for quite some time. However, solar panels have been added to the mountaintop to provide energy for the desalination plant. Although immeasurable, household rainwater collection still exists but is not locally regulated. Still, it is not enough to meet the needs of the islanders. Thus, the island continues to look to outside sources to satisfy its growing water needs. During the high point of the tourist season, huge tankers filled with fresh water travel weekly from Napoli to various points throughout the islands. Almost 300,000 cubic meters are provided to the Island of Lipari (B. Bonino, personal communication, July 4, 2016). Upon their arrival at the island of Lipari, they are hooked up to large storage tanks in both Acquacalda and the outskirts of the city of Lipari. Once they are depleted of their fresh water, they are filled with salt water to weigh them down and return back to Napoli.

In addition to water that is shipped to the islands, there is also an active *desalinatore* (desalinization plant) that has been in existence since 1989 (Leone, 2009). However, this plant has not been in continual operation since its inception. In 2013, the modernization of the desalinization plant began. As could be imagined, the community had little faith that it was the solution. In response, Aqua Blue CEO, Klaus Dieter Simon, (as cited in Igor, 2009) urged the community to see the advancement of the desalinization plant as the solution to a long and hard fought battle to provide the island with cost effective water. In an open letter to the Liparoti,

Simon noted misuse of public finding which included a \$38 million government bond given to the islands to improve the water system. He went further to call it “an unconscionable waste of public money” (para. 6). Further, Simon notes that with the desalinization upgrades, the use of solar power and a reverse osmosis system, he can cut the costs of water from 14 euro per cubic meter of water to as low as 3 euro (para. 4). However, as of the summer of 2016, fees for water remained the same, even with the desalinization plant up and running according to locals. Two factors explain this. The first is the fact that tankers continue to bring water having recently renegotiated another large contract. The second is the desalinization plant has not yet been brought up to full capacity, nor has the project to bring water to the entire island been completed yet. Thus, due to a variety of infrastructure issues and conflicts with local policy, the desalinization plant has been limited in meeting its potential. While, as of 2016, it has the capacity to produce up to 45,000 cubic meters a day, its ability to do this consistently is still limited (B. Bonino, personal communication, July 4, 2016; Leone, 2016c).

### **Potability**

This brings us to our next category: water potability. When the topic of conversation turns toward water and its potability, the researchers’ experiences point toward the following generalizations: the water, straight from the tap, should never be consumed. One can use it to cook, bathe, and brush teeth; however, there are varying opinions on whether it should be used for coffee. Upon closer examination, the issue is that of high levels of iron in the water. In February 2015, the water was declared potable, revoking a one-month ordinance that had been in effect (Leone, 2015). A year later, locals still purchase bottled water and prefer it over tap. In my conversation with Vice Mayor Orto (personal communication, January 11, 2017), he explicitly noted that the water that arrives by ship is clean as it must pass a sanitation check before being shipped. Further, the cisterns and the water coming from the desalinization plant is tested every three months to ensure that it is clean. However, despite the assurances of community leadership, water from the tap is still considered to be undrinkable on a daily basis. The results of this are the reliance on a third source of water: bottled water. On any given morning the average pedestrian can observe city trash bins lining the streets overflowing with empty water bottles, stores sell bottled water by the case, and it is relatively cheap. Thus, most Liparoti agree that bottled water is best used for making coffee and drinking directly. While not measured for this study, the Islands reliance on bottled water results in mass amounts of plastic that must return to Milazzo to be recycled. This means that it takes two trips across the same waterway once as a finished product for purchase, and then as recyclable trash. Taken together, the continued mistrust of water obtained by tankers or through the desalinization process has resulted in a significant reliance on bottled water and the byproducts resulting from its use. This problem is compounded by increased numbers of tourists in the summer who also rely on bottled water and by extension, contribute to an increased amount of plastic waste.

## ▪ Tourists Versus Locals

Because tourism is the mainstay of Lipari, the water systems of the island are set up to ensure that the average tourist does not experience even a temporary outage of water. This includes shipments of water completely dedicated to the hotel industry. During the months of June, July, August, September, and October, an average of 700 metric liters of water are shipped for hotel use alone (B. Bonino, personal communication, , July 4, 2016). However, even with the water specifically allocated to the hotel industry, shortages can still occur. For example, in July 2015 despite more than 35,000 metric liters (B. Bonino, personal communication, July 4, 2016) of water being shipped to Lipari, those that operate businesses in Marina Corta experienced a lack of water for over two weeks at the height of the tourist season. The community perception affirms that when there is a shortage of water, hotels are the last to lose water. In my own experience, each of the houses that I lived in relied on an underground well and a pump system to provide water. In order for the pumping system to function properly, the water was maintained at a certain level. Thus, around every two weeks, the water pressure became observably weaker for some private homes, until a new shipment of water was delivered. This raises a question: to what extent do the tourists' ignorance water issues fuel a level of waste that could be reduced with better dissemination of information?

## Water as Transportation

In addition to the use of water for human consumption on the island, there is also the issue of the use of the surrounding seawater. Locals and tourists alike are completely reliant on boats to get to and from the islands. Further, one of the more lucrative sectors of the tourist industry is the daily boat excursions to various places of interest throughout all seven islands. This lucrative industry moves tourists throughout the islands, and it is often one of the most popular activities for tourists. As a result, policy to regulate the islands and the waterways can impact locals and tourists alike. As early as 1991, there have been proposals for a marine park or sanctuary to further protect the islands surrounding coastline and waterways (Leone, 2009). However, this is a source of great controversy for locals due to the perceived fear of restrictions that will limit the usage of such waterways. Currently, articles in the local blog suggest public opinions are torn. (Leone, 2016h)

In January 2017, a large storm front moved in, blanketing the regions of Catania and Messina in snow. Due to the high winds and the storm, ships were unable to pass between the main island of Sicily and the smaller islands that surround it. In terms of the Aeolian community, while they are accustomed to planning travel around sea conditions, an adversarial relationship often exists between people and the sea. For example, many teachers do not live on the islands; instead, they commute by sea each day. If the sea is too rough, classes are cancelled. This can happen multiple times a year. In fact, in the 2015–2016 school year, 11 school days were lost due to bad sea conditions according to locals (S. Mandina, mother, personal communication, July 7, 2016).

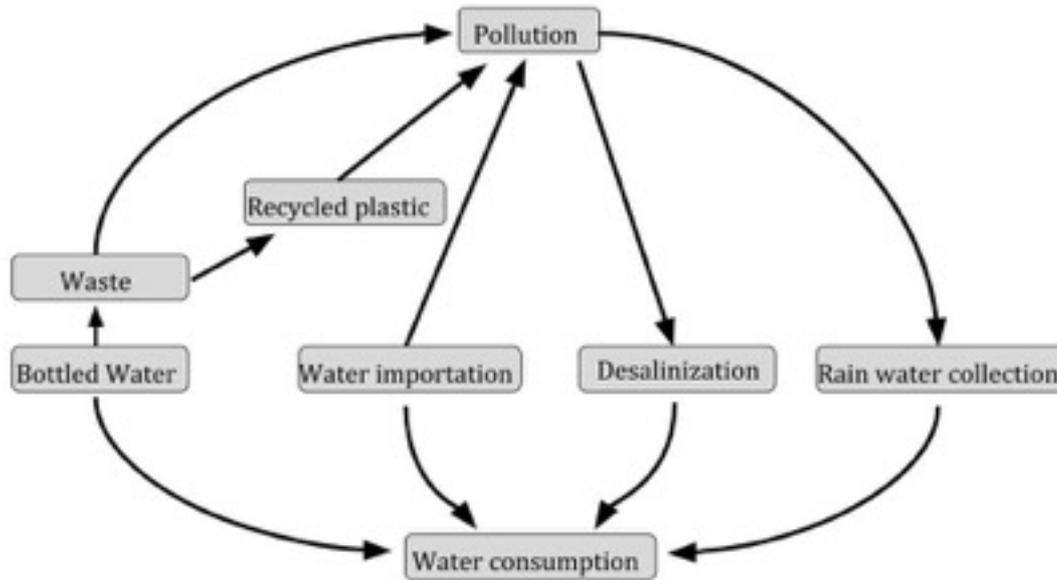
While the seas are mostly calm during the summer months, the occasional *sirocco* (a warm wind storm that comes up from Africa) can cause significant havoc on travel. In the summer of 2016, a hydrofoil crashed into the pier of Stromboli, ending up partially submerged under the pier and causing emergency evacuation procedures that closed off the port for a few days (Leone, 2016i).

Taken together, each of these issues challenges the Liparoti capacity to flourish. While it creates a perplexing complexity as to how to resolve issues such as effectively providing water without damaging the island's natural ecosystems, it also demonstrates the ingenuity of the Liparoti. Despite their long history of insufficient water, the people have used the natural geography of the island to move water throughout by way of cisterns and rain collection on its mountaintops. Further, when this did not suffice, resourceful leaders contracted with others to insure this resource was imported. Thus, the issue now becomes, to what extent will the current system allow the people of the island of Lipari to continue to flourish? As a reliance on tourism continues to grow, and the demands for water are further compromised by an antiquated system that forces islanders to rely on other, also limited resources for water, the capacity for them to flourish also becomes limited. The mentality of the Liparoto (a person who was born and lives in Lipari) is one that includes a strong respect for the water as it plays a significant role in their lives. From existing as a core ingredient for survival as humans to its role in the economy as a model of transportation and tourist attraction, the Liparoti are intrinsically tied to the water that surrounds them. Their capacity to resourcefully address these issues as they move forward is one of the essential keys to their future flourishing.

### **The Complexity of Addressing Water Issues**

In terms of a complex systems approach, the challenges of the Liparoti regarding water illustrate the best examples of the complex interactions between factors and potential solutions. As seen in Figure 1, there are four main sources of water: desalinization, importation, rainwater, and bottled water. While each provides water for islanders, the consumption of bottled water creates its own loop: water obtained through bottles creates waste from the bottles that can either be recycled or remain waste. The waste creates pollution, as do the shipping of recycled bottles shipped from the islands to the mainland: the shipping pollutes the air through CO2 emissions as well as the water through the release of oil into the seawater. This pollution eventually affects the water used for desalinization and rainwater collection.

Figure 1 illustrates how some factors of water consumption on the island affect other factors. Seemingly unrelated, the transportation of water on large tankers in conjunction with desalinization and rainwater collection demonstrate the interconnectivity of these issues.



*Figure 1.* The water loop. This figure illustrates the feedback loops associated with water systems in Lipari. Author's figure.

Again, tankers moving water across the sea pollute the air and water—the same water used in the desalinization process for the islands. Many islanders (e.g., S. Mandina, personal communication, July 2016; E. Spina, personal communication, July 2015, July 2016, January 2017) are against importing water from Napoli, and they favor developing water structures that allow the islands to sustain themselves however, how they envision the solution is limited by several factors.

- **Promoting a systemic shift in thinking by community members**

Missing from the simplistic rendition of water in figure 1 is the role of people themselves. Community members often perceive water on tankers as unhealthy, and desalinization as an unreliable process (Leone, 2016c). These perceptions can further add to the complexity of this problem by increasing the reliance on bottled water. Thus, considering social factors affecting the holistic awareness of water can be another vital ingredient in developing a solution. Among other factors, education could help reduce use of bottled water if it informs people beyond the simplistic perception that recycling water bottles cancels out environmental damage caused by shipping them. The current disassociation between the environmental effects of pollution created in recycling water bottles and the mass consumption of bottled support the idea that there is a need for education of community members in reconnecting the consequences of their choices to the impacts on nature (Worthy, 2013). However, this is only one aspect of the complex puzzle that must be addressed.

As always, education is an effective lever in the move toward a sustainably flourishing future. In addition to helping community members become far more informed about the impacts of particular choices, thus promoting systemic shifts in individual and community thinking, education can bolster community engagement. In so doing, community and individual agency provides new opportunities for innovation and creative solutions from a broader scope of participants. Communities that enact a decentralized process where all citizens have the opportunity to do more

than just have their say and actively participate in the decision-making process, are politically empowered with great potential to flourish through creative solutions from a broader spectrum of community members. Capitalizing on pre-existing structures that support this engagement can be the most effective way to shift thinking and increase community engagement.

Within the community of the islands, there are multiple community-based organizations that demonstrate the Liparoti loyalty to their home. Even more so, they are evidence, that community members are hungry to become reconnected with nature, and have a strong desire to improve where they live with not compromising the environment. Nesos (Nesos, 2017), and “Greenriders” are two such programs designed to educate the Liparoti, to connect community members with nature, and to embody the social changes required to create lasting behavioral shifts. Nesos is a local environmental organization that promotes hiking excursions and tours specifically for locals. The “Greenriders” (S. Giardina, restaurant worker, personal communication, June 2016), is a group of Liparoti that hike together on a weekly basis. Each season, its founding member, Stefano limits the initial group to roughly 15 people, however, by the end of each season, the number of weekly participants exceeds 35 people. Hiking roughly two to four hours a week, participants explore the lesser known paths of the main island of Lipari. Further it demonstrates that locals value their connections to nature. Programs such as these have the capacity to provide community education about the ecological impacts of over consumption and waste. They offer community members opportunities while they hike to see firsthand the impacts of ecological waste (Worthy, 2013).

Another program hosted by Nesos entitled, *Conosci le tue isole!* is an Italian play on words denoting either “Do you know your islands?” or “Get to know your islands!” According to its founder, Pietro Lo Cascio, its sole purpose is to encourage locals to tour their islands because despite the closeness of these islands, some from Lipari have never visited Vulcano. Community organizations can become localized points for communication about the health standards for various forms of water production and the recycling processes. This type of activism can place the power to make environmental changes squarely in the hands of those who consume the water (Lich et al., 2012). Thus, as argued throughout this paper, one of the most vital ingredients in a systemic shift toward sustainably flourishing is the agency of community members themselves. An emphasis on connecting people and enabling their participation in developing long-term solutions directly related to their personal experiences and needs can insure the quality and support of future water policies (Zautra et al., 2008). In this case, providing opportunities for community members to examine the water issue as a multilayered system could address the negative feedback loop cause by the use of bottled water, or the over simplification of solutions such as desalinization and imported water. This can create opportunities for innovative solutions that are win-win for the environment and the Liparoti as well as address their unique needs (Wells, 2013).

One area that still remains to be explored with more detail, is the former use of Monte Sant’ Angelo as a rainwater capture system. It remains unclear to me why rainwater collection was stopped. Vice Mayor Orto (personal communication, January 11, 2017) suggested that this may be due to the lack of infrastructure to create potable water. Enabling the community to come together and evaluate the capacity of rainwater may allow for alternative solutions that could be enacted with confidence.

As argued before, community created policy often results in higher rates of adherence, thus ensuring effective outcomes (Wright, 2010).

## **Conclusion**

Water usage is an important component for ensuring a flourishing future for the Liparoti. Moving forward, it is important to recognize the multiple uses of water for the islands. Because water is also commodity that promotes economic gains (Mikhailovich, 2009), all stakeholders must be brought into the conversations to insure an open and clear process (Forno & Graziano, 2014). The continual use of short-term solutions that include shipping water to the islands, may become less sustainable as water become scarcer in the future (Sachs, 2015). An integrative approach to addressing the lack of water, that combines multiple sources, thus eliminating a reliance on any one single source, is essential in creating lasting and sustainably flourishing solutions. In addition to a deep need to improve the actual water infrastructures of the island, the islands will need to consider investing in the restoration of rainwater collection as well as examining desalinization as core pieces of their future work. As sea levels rise, warm, and acidify due to climate change, relying on the sea for water could place desalinization as a part of another negative feedback loop in the Aeolian issue of water.

Each of these issues reflects the powerful relationship between people and nature. As previously mentioned, the modern era reflects an adversarial relationship between people and nature (Crowley, 2010). However, the 21st century is marked by a great shift in this perception and a desire for harmony and connection with nature (Edwards, 2005). While we are racing to compete to for the scarce allocation of water in the Aeolian Islands, we are missing the sheer interconnections that such an issue calls for (Macy, 2007). The privatization of water has caused an unnecessary competition that hinders the islands' flourishing (Wright, 2010). By monetizing water, the economic and political structures of Italy have created a power system that leaves the Aeolians without autonomy and thus creates a competitive structure (Hardt & Negri, 2009). In monetizing such resources and creating a gap between those that "have" water and those that do not, communities such as the Liparoti are pitted against those in Napoli who own their water (Hannis, 2016). Thus, instead of working together for the benefit of all, a sense of threat and malintention is cultivated further harming the ability for all to flourish. "The value shift of the cultural turning calls us to turn from measuring well-being by the size of our yachts and bank accounts to measuring well-being by the health of our families, communities and natural environment" (Korten, 2006, Synopsis of the Argument, "The Economic Turning," para. 1). In shifting our perspective of well-being from controlling resources such as water, to promoting an equitable sense of well-being for all, water becomes a common good, not to be owned, but wisely and equitably allocated to all. In so doing our relationship to nature is restored, ensuring that no one group flourishes as the expense of others (Macy, 2007).

In terms of the qualities of a flourishing community, not only is a significant shift in the perception of water needed, but also a common and shared vision and localized policy and decision making are required. Similar to other issues presented in this paper, the complexity of water supply makes it a challenge to provide a simple solution. As has been pointed out and will continue to be pointed out, agency and lack of community involvement in decision making leaves the Liparoti victims. Lack of clarity and accessible information forces the community into an adversarial

relationship not only with water, but also with the policymaking structures of Sicily and greater Italy.

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