

# Designing Disaster Prevention from a Clothing Perspective

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## Abstract

In 2018, after experiencing destructive torrential rains in western Japan, I became intrigued by the role that clothing plays in saving lives. Research on disaster prevention clothing is usually focused on protecting the physical body, at times also discussing how to make disaster prevention clothing more ‘fashionable’. However psychological dimensions are usually ignored, in spite of the fact that body and mind are inseparable. Thus, in this study, I challenge and redefine the concept of disaster-prevention clothing by considering it in relation to the whole ‘living entity’ (*ikimi/ 生き身*). To achieve this, I conducted interviews with involved groups, such as disaster victims and clothing manufacturers.

Using the KJ method, I then spatially arranged 70 themes after analyzing and organizing interviewee expressions into groups. Finally, I interpreted the relationships between those themes via 16 story-based essays, while reflecting and connecting them to my experience.

The process leads me to propose the word *ikasarerufuku* for disaster prevention clothing. The word encompasses the characteristics of garments that protect the whole ‘living entity’, expanding the concept of disaster prevention clothing to include not only the physical but also the psychological well-being of people facing, escaping, and recovering from disaster.

**Keywords:** *Disaster prevention; Clothing; Fashion; Media; Environment*

## 1. Introduction

Can't clothing protect people's lives from natural disasters?

In 2018, during a journey to western Japan, I encountered torrential rainfall. Damage caused by heavy rainfall is on the rise: according to a 2019 report by the World Meteorological Organization (WMO), meteorological disasters have increased fivefold in the past 50 years due to climate change (1). In 2021, the Intergovernmental Panel on Climate Change (IPCC) conclusively attributed the cause of global warming to human activities for the first time (2).

As someone working in the fashion industry, clothing had been my livelihood. But after a direct encounter with extreme weather, I came to a renewed realization of the growing role that clothing plays in protecting human bodies and human lives. In 2019, the United Nations identified the fashion industry as the second most polluting industry in the world (3) – making it a major contributor to extreme weather caused by climate change.

### 1.1. Existing research

Referring to previous studies of ‘fashion clothing’ research, this section discusses previous studies of ‘disaster-proof clothing’. Below are three perspectives (A, B, C) derived from existing research in fashion studies that are essential to consider when thinking about disaster prevention clothing;

### 1.1.1. Fashion / Clothing research

#### A. Physical protection perspective

- Clothing is given to humans as soon as they are born, ‘dressing’ is taken for granted and not thought about (4, 5).
- Physical protection is too pervasive to be discussed (6,7).

My perspective on A is that only when I was soaked in a torrential rain disaster, and my clothes did not work to protect me, did I realize the importance of protecting myself with clothing.

#### B. General fashion perspective

- Modes of fashion/fashion phenomena (8).
- Changing clothing and appearance of certain groups of people (9).

B is the meaning of the word fashion that people imagine when they hear the word fashion or clothing in general.

#### C. Perspective that the clothes we wear create our hearts and express our minds

- Clothing cognition in which the garment worn represents the wearer’s mind (10).
- Fashion as the living skin of society (11).

C is a point not discussed in the current disaster-prevention clothing study.

### 1.1.2. Disaster prevention clothing

In research on disaster prevention, the term ‘disaster prevention clothing’ is used only for the following two purposes: ‘physical protection’ or ‘uniforms’, The term ‘disaster prevention clothing’ is used in the sense of physical protection and ‘signs’ indicating a uniform-like appearance. The research of Kadota et al. (12,13) is limited to the design of physical protection against the causes of death in natural disasters and the addition of the essence of fashion. Research on materials for disaster prevention is discussed, such as those that protect against fire and chemical threats (14,15,16).

However, research on the design of disaster prevention clothing in the sense of identifying the type of disaster and protecting oneself from that disaster with clothing has only been conducted in Kadota.

From the viewpoint of fashion and clothing research, only A (Physical protection perspective) and B (Fashionable perspective) have been discussed, but C, the ‘mind,’ has not been discussed. The human body cannot be separated from the ‘mind’ and the ‘body’. By combining the two, I believe that we can protect ourselves from natural disasters.

## 1.2 Purpose of this research

In current research, ‘disaster-prevention clothing’ is discussed only in terms of physical protection and fashion – but I propose that disaster-prevention clothing should be designed to protect the whole ‘living entity’ (*ikimi* (生き身)), as our body and mind always co-exist and co-depend. I consider the term *ikimi* (生き身) to refer to body and mind together, and examine what kind of clothing protects both the physical and the psychological/mental (see Fig. 1).

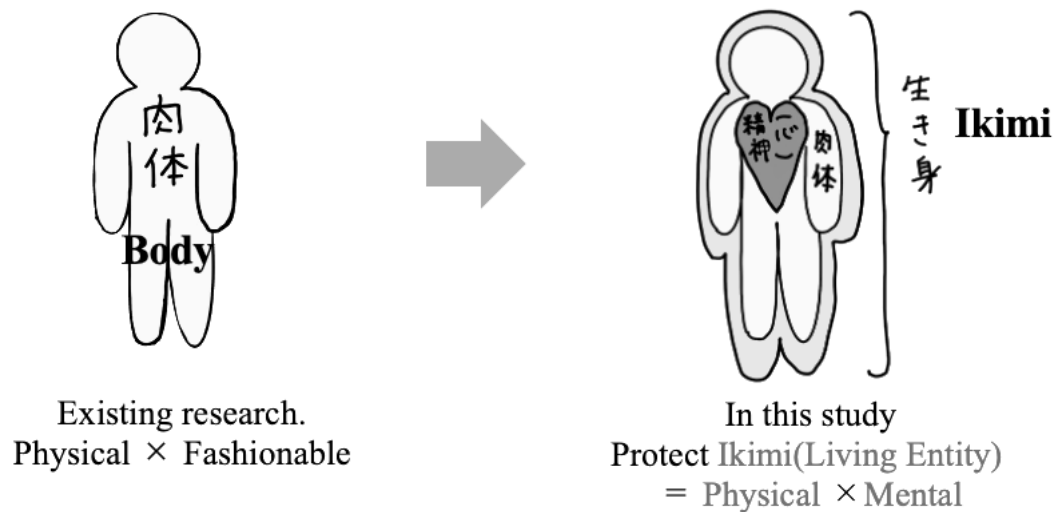


Figure 1 : Definition of the Ikimi(生き身) (Living Entity) protected in this study.  
(Illustration by Sonoko Suzuki 2023)

The purpose of the study is:

1. To show the range of ways in which clothing protects people in situations of natural disaster.
2. To create a more complete alternative to the term ‘disaster-prevention clothing’.

I attempt to replace the term ‘disaster-prevention clothing’ with a term that people are more familiar with. In addition, this research deals with more than just clothing. That is, clothing is dependent on the ‘environment of the place’, depending on which it may or may not function.

## 2. Methods

To capture the still little-explored phenomenon of disaster-prevention clothing, it seemed to use qualitative research. Twenty people were interviewed using semi-structured interviews and the results analyzed using the KJ method. The KJ method, devised by cultural anthropologist Jiro Kawakita, is used to summarize heterogeneous data. In this study, I interviewed individuals from various fields regarding a garment not clearly defined as ‘disaster prevention clothing’. Due to the fundamentally different and heterogeneous nature of the data, I opted to use the KJ method to analyze and clarify it. This method aims to compile raw material from chaotic realities. Self-reflection was also used and the results integrated with the results of the KJ method analysis, which were summarized in 16 essays.

### 2.1. Participants

Participants were mainly men and women in their 20s to 60s who had experienced earthquakes, tsunamis and torrential rains, as well as local government officials and educators in the affected areas, NPO staff, garment designers and employees of workwear brands.

Additional interview Participants / A total of seven additional interviews were conducted with three Tohoku Electric Power Company officials, local government officials, Self-Defense Force

officials and tsunami survivors, who were considered necessary to further deepen the units derived from the KJ method analysis.

### 2.2. Interview methodology

Two methods of interviewing were used: semi-structured interviews and unstructured interviews. The following questions were prepared for the semi-structured interviews. (All additional interviews were conducted using an unstructured interview technique.)

1. Please tell us as much as you can remember about your own behavior at the time of the disaster, in chronological order, from the time you were evacuated to the present day.
2. Looking back on the time of the disaster, what events do you remember most?
3. What were the things that were needed in the shelter when you were evacuated?
4. What disaster preparedness measures are currently in place?

### 2.3. Structuring Data Using the KJ Method

From the raw data of 20 interviewees, I extracted 867 tags that I consider important (①). The data of those relations that are close to each other were overlaid, resulting in 232 units (②). Furthermore, the descriptions in (②) were interpreted and covered on each other, resulting in 70 units (③). These 70 units were placed in a spatial position, and the relationships between the units were interpreted and described in connection with my own experience. Where necessary, unstructured interviews were conducted to further deepen our understanding. These resulted in 16 story-based essays. This essay is the conclusion of this research (See Fig. 2).

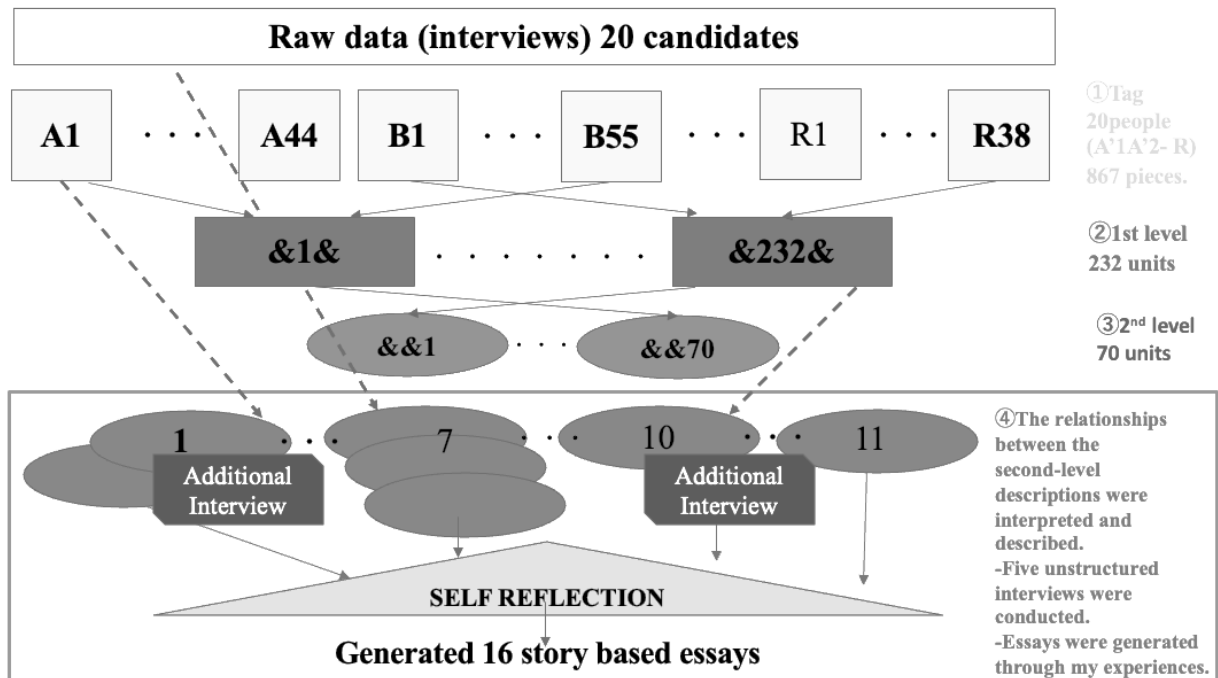


Figure 2 : Structuring Data Using the KJ Method. (Illustration by Sonoko Suzuki 2023)

### 3. Result

#### 3.1. 16 story-based essays

Underlines indicate essays below related to clothing and non-clothing results. As explained earlier, the essays also deal with the environment and the place surrounding the garments in the affected areas, so the results of the non-clothing analysis are also available.

- 1 Cozy touches that brought feelings of security in a disaster area: memories of an encounter between humans and fabrics.
- 2 The potential of clothing; clothing is a stockpile.
- 3 Prepare clothes that will keep the mind active in the time of disaster.
- 4 High brands and UNIQLO examined from a disaster prevention perspective
- 5 Clothing can/will play a role in implicit communication
- 6 Human-centered design creates clothes that protect the *ikimi* (生き身)
- 7 The irony of Onagawa NPP as an excellent evacuation center
- 8 The difference between the roles of the Self-Defense Forces and local government employees, as seen through their clothing.
- 9 ‘All human beings are designers’: cultivating observation skills through the body on a daily basis and activating bricolage in the event of a disaster.
- 10 The problem of women appearing in the disaster area from the perspective of human ‘biological’ and ‘sociological’ nature
- 11 Eye-catching natural disaster monuments enable survivors to move to new safe places
- 12 Disaster prevention with clothes begins with weaving a language that can be transformed into disaster prevention clothing.
- 13 Children are the best medium for disaster reduction
- 14 Calming tactile talismans that act as ‘tsunami charms’
- 15 Spontaneous acts of storytelling
- 16 Fresh, caring food; clothing and housing protect human dignity

#### 3.2. 16 story-based essays visualization

Figure 3 shows the items that have emerged in the 16 story-based essays that can and have protected *Ikimi* (生き身) by ‘touching’ the body and ‘covering’ the body. In other words, this is a list of disaster prevention clothing. It was everything which can be clothing (including items that were not originally intended as such) instead of what is usually considered as clothing.

16 story-based essays visualization

What is disaster prevention clothing?

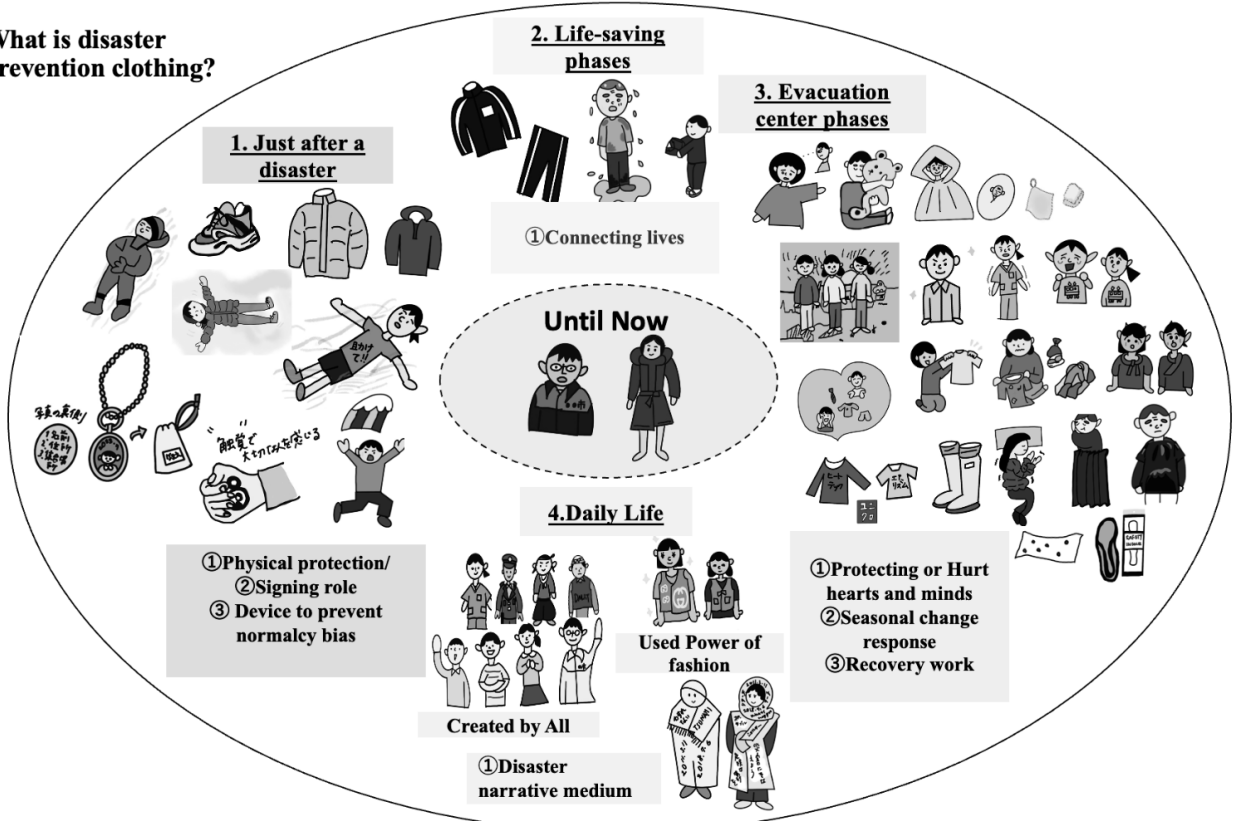


Figure 3 : 16 story-based essays visualization. (Illustration by Sonoko Suzuki 2023)

The existing research on disaster-prevention clothing is only between 1 and 2, and is the uniform of the local government, which is called disaster-prevention clothing, indicating that the meaning of the clothing has been extended to the extent that it is around us.

The ‘disaster prevention clothing’ derived from this study can be considered in four phases. The first is ‘things that change with time.’

1. Just after a disaster

Where: Disaster Site

1 Physical protection

Down coats and lightweight sneakers are items that enhance buoyancy and actively protect the body.

2 Signaling role

Highly visible clothing can serve as an ‘SOS’. If clothing plays the role of SOS, it will help to conserve physical strength and increase survival rates.

3 Device to prevent normalcy bias

Tactile amulets prevent ‘normalcy ‘bias’ and encourage self-protective behavior.

2. Life-saving phases

From the scene to emergency rescue (within 72 hours of the disaster)

Where: The site to Emergency and critical care center

1 Connecting lives

A man exposed to a tsunami was evacuated to a junior high school. A student there gave the man his own dry jersey, which allowed the man to dry himself, thus preventing him from suffering from hypothermia and saving his life.

### 3. Evacuation center phases

One year after the disaster

Where: Evacuation center

#### 1 Protecting or Hurt hearts and minds

The colorful clothing became a beacon of hope for the survivors.

Against the gray environment expressed by the colorless, colorful clothing became a kind of 'light' and lit up the disaster area. The well-starched shirts and cozy fabrics brought a sense of comfort and strength to the survivors. On the other hand, victims' feelings were hurt when they were provided with any old clothes that happened to be on hand. Clothing needs to be selected with thought and care.

#### 2 Responding to Seasonal response

Clothing that could cope with 'hot' and 'cold' was important during the long periods of shelter life. Interestingly, improvised bricolage was used to create the clothing and items needed for the situation. The use of rubber bags as outerwear demonstrated the flexibility of improvised bricolage in the disaster area to produce needed items locally.

#### 3 Items needed for recovery work

Equipment needed for recovery work, such as boots and anti-skid insoles, was taken into consideration.

### 4. Daily Life phases

#### 1 Disaster Narrative Media

The clothes made can also serve as a medium to convey the history of the disaster. To promote this concept, it may be effective to use 'the fascination of clothes that beguile the mind' specific to fashion, such as high-brand clothing. Disaster prevention clothing that 'connects lives' should involve the people who use it and be made by everyone. Currently, only disaster victims are being studied for disaster-prevention clothing, but it should also include all rescuers, including local government officials and medical personnel who provide support.

### **3.3. Creating a language to replace disaster-prevention clothing**

The reason why it is necessary to create a word to replace 'disaster prevention clothing' is that the word 'disaster prevention clothing' has a strong nuance, and analysis has shown (See 3.1. 16 story-based essay /12) that it is a word that prevents people from using clothing to prevent disasters. For example, when we think of disaster prevention clothing, we think of space suits or highly functional clothing with a cherry blossom logo (Special life jackets with national type approval). These garments are not garments that exist in everyday life, but are only used by special people on special occasions.

In this research, in order to promote disaster prevention through clothing, I tried to replace the term 'disaster prevention clothing' with a more intuitive term.

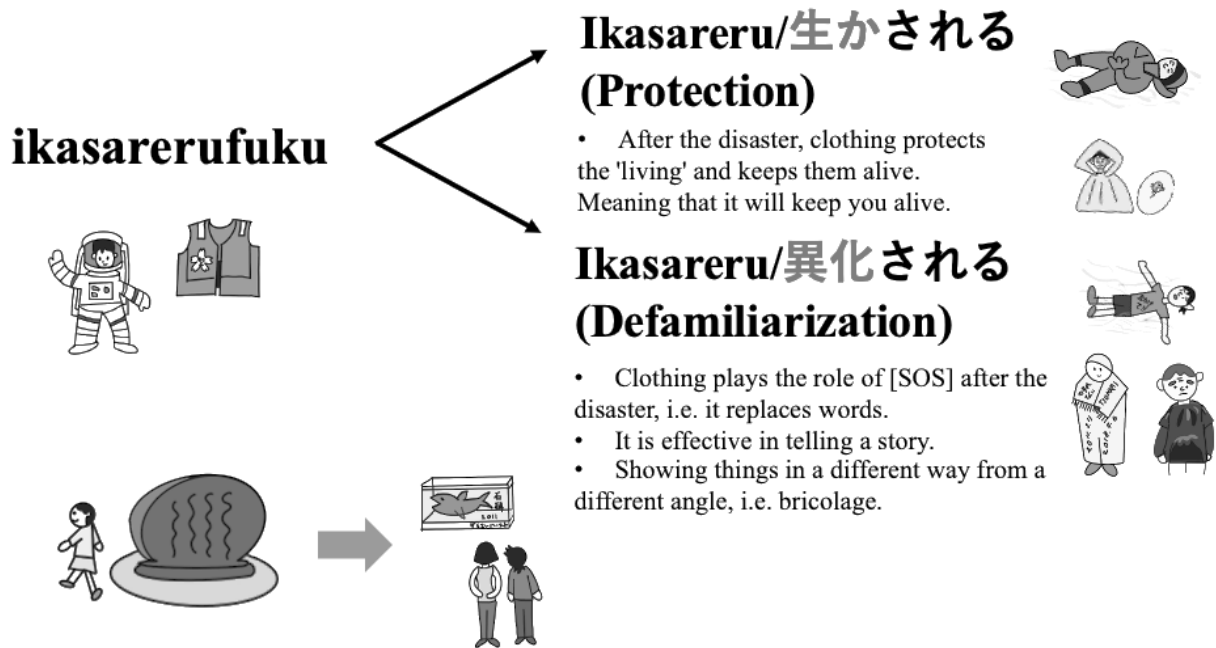


Figure 4 : 'Ikasarerufuku' meaning. (Illustration by Sonoko Suzuki 2023)

I have named it 'ikasarerufuku', combining the words 'fuku', meaning clothing, and 'ikasareru', which has two meanings. The first is 'to live, to protect, and to sustain life.' The second is 'to be able to see clearly' or 'to extend perception'. This term relies on the Russian Formalism of Viktor Shklovsky's 'defamiliarization' (17). Defamiliarization is the artistic technique of presenting to audience's common things in an unfamiliar way so they could gain new perspectives and see the world differently. This is also the meaning of bricolage, in which clothing plays the role of SOS, 'to make visible, to make perceptions last longer,' and to show things in a different way. This applies to things like a garbage bag turned into an outer garment. In other words, ikasarerufuku is a word that replaces 'disaster prevention clothing,' a word that indicates the role of disaster prevention clothing as expressed in my analysis.

From the perspective of 異化される服 (Defamiliarization on clothing), it is necessary to use highly visible colors and striking designs to quickly locate people during disasters without depleting the survivors' physical strength. On the other hand, in the context of 生かされる服 (life-sustaining clothing), the necessity varies depending on the type of disaster, but materials and clothing designs that "connect lives" are required for any disaster. The combination of these aspects will result in 'Ikasarerufuku'.

#### 4. Discussion and Conclusion

Fashion and clothing research to date has focused on the manipulation of clothing by humans. Research has focused on the phenomenon of mode (fashion), which began as a way to overcome physical protection, to satisfy human desires and to express one's identity. In this study, 'clothing' was reconsidered from a 'bird's eye view' through a consideration of what 'disaster prevention clothing' is. As a result, clothing can be considered a 'physical environment tool for survival' when viewed in relation to disaster prevention. The concept of clothing was thus expanded.

The fashion industry causes environmental pollution, which in turn causes heavy rainfall disasters. With a proper understanding of clothing, we can protect ourselves from the dangers of



disasters around us. Considering disaster-prevention clothing means examining the philosophy of clothing: ‘Why do clothes exist? Clothing is the most important possession for human beings, which accompanies us from the time of birth to the time of death.

Considering clothing from the perspective of disaster prevention clothing makes it possible to look at clothing from a dissimilar perspective. To think of disaster-prevention clothing is to familiarize it through ‘defamiliarization’. This study is a suggestion for a new disaster prevention media design for disaster prevention research, giving a new perspective to fashion and clothing research.

## Notes

1. World Meteorological Organization, *WMO Atlas of Mortality and Economic Losses from Weather, Climate and Water*, (Geneva: World Meteorological Organization, 2021), 19.  
[https://library.wmo.int/viewer/57564?medianame=1267\\_Atlas\\_of\\_Mortality\\_en\\_#page=3&viewer=picture&o=bookmarks&n=0&q=](https://library.wmo.int/viewer/57564?medianame=1267_Atlas_of_Mortality_en_#page=3&viewer=picture&o=bookmarks&n=0&q=).
2. Masson-Delmotte, V., and Masson-Delmotte (eds.) V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou. 2021. “IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change” (IPCC,2021), 9.  
[https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_SPM.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf)
3. “Global Perspective Human Stories.” *UN News*, 25, 2019.  
<https://news.un.org/en/story/2019/03/1035161>.
4. Hiroshi Ashida, *Kotoba to Ifuku* [Words and Clothing](Tokyo: AdachiPress, 2021), 7.
5. Kiyokazu Washida, *Hito wa Naze Fuku wo Kirunoka* [Why People Wear Clothing?] (Tokyo: Chikumashobo,2012), 8.
6. Hiroshi Ashida, *Kotoba to Ifuku* [Words and Clothing] (Tokyo: AdachiPress, 2021), 8.
7. Kiyokazu Washida, *Hito wa Naze Fuku wo Kirunoka* [Why People Wear Clothing?] (Tokyo: Chikumashobo, 2012), 8-9.
8. Roland Barthes, Roland Barthes *Mode Theory Collection* (Tokyo: Chikumashobo, 2011), 42.
9. Welters, Linda, and Abby Lillethun, *Fashion History: A Global View* (London: New York: Bloomsbury Academic, 2018).
10. Adam, Hajo, and Adam D. Galinsky. “Enclothed Cognition,” *Journal of experimental social psychology* 48, 48, no. 4 (2012): 918–25.  
<https://doi.org/10.1016/j.jesp.2012.02.008>.
11. Kiyokazu Washida, *Chiguhagunashintai: Fashion tte nani?* [The Inconsistent Body: What is Fashion?] (Tokyo: Chikumashobo, 2005), 54.

12. Chie Kadota, and Megumi Kondo. “Ippanjoseiyou Bousaihuku kaihatsunimuketa saigaitokino iryouhin nojyunbi jyoukyo to mondaitennikansuru chosa [Survey on the State and Issues of Clothing in Disasters for the Development of Disaster Clothing for Women],” *Seikatsugakuron kai = Journal of lifology* 38, 38 (2020): 97–110.
13. Chie Kadota, and Momoko Tanaka. “Bousaifukuyou no Town-gi [Town Fashion for Disaster Prevention Clothing],” *Fukushokubunkagakaishi. sakuhinhen : costume and textile = Journal of costume and textile* 6, no. 1 (2013): 31–35.
14. Saito Isoo. “Safety & Disaster Prevention (Industrial Uses).” *Sen-I Gakkaishi* [Journal of Fiber Science and Technology] 70. Tōkyō-to: Dō Gakkai, 2014.  
<https://doi.org/10.2115/fiber.70.P-526>.
15. Yoon Kee Jong el. “Bousaifukusozai no Kaihatsudouki [Reasons for the development of disaster-prevention clothing materials],” *Sen-I Gakkaishi* [Journal of Fiber Science and Technology] 66, no. 3 (March 10, 2010): P\_106-P\_113.  
[https://doi.org/10.2115/fiber.66.P\\_106](https://doi.org/10.2115/fiber.66.P_106).
16. Barker, R., S. Deaton, D. Thompson, Roger Barker, Shawn Deaton, Gail Liston, and Donald Thompson. “A CB Protective Firefighter Turnout Suit.” *International Journal of Occupational Safety and Ergonomics: JOSE*. 16. Norwood, N.J.: Ablex Pub. Corp, 2010.  
<https://doi.org/10.1080/10803548.2010.11076835>.
17. Kenzaburo Oe. *Atarashii Bungaku no tameni. Iwanamishinsho* [For New Literature: Iwanamishinsho] (Tokyo: Iwanamishinsho, 1988).

## Author Biography

### Sonoko Suzuki

Sonoko Suzuki completed her master's degree at Keio University in September 2023 and is currently a senior researcher at the Keio Research Institute at SFC. For many years, she has worked in public relations and marketing for national and international fashion companies. Her interest is the potential value of the functional aspects of clothing. It is an exploration of the relationship between man, nature and clothing.