

Mid- to Long-term Evolution of NHK's Documentary

Production Methods

Focusing on Technological Environment

April 2019

MIYATA Akira

NHK Broadcasting Culture Research Institute

Abstract

NHK's production methods of TV documentaries have been significantly influenced by the following four stages of technological evolution: 1) adoption of 16mm film as a recording medium in the pioneer days of television, 2) spread of synchronized sound recording technique during the period from the late 60s to the early 70s, 3) conversion from film to video tape recording for location shooting from the late 70s to early 80s, and 4) progress in digitalization throughout the production process since the mid-80s. Each of these technological developments were groundbreaking in terms of creating a technological environment that all those involved in the production of TV documentaries at NHK could rely on over more than a decade and leading to the establishment of production methods fitting for each environment.

This article overviews the major TV documentaries presented by NHK during the period from 1953, when the television broadcasting officially started, to 2018 and looks into the mid- to long-term evolution of documentary production methods, focusing on technological environment. Based on the findings from the research, the over-60-year history of NHK TV documentaries were divided into four periods.

1. Introduction

Production methods of TV documentaries (hereinafter referred to as TD) have changed over time.

This article presents a list of major NHK TD from 1953, when NHK began full-scale TV broadcasting, to 2018. It also looks at mid- to long-term developments of production methods mainly from the viewpoint of the technological environment.

TD production methods have been mentioned by studies into individuals involved in the production and by studies into specific programs. But there has been none that looks at NHK TD as a whole and focuses on mid- to long-term developments of production methods.¹ The

¹ *Hoso Gijutsu Shakai Bunkashi Josetsu* (An Introduction to the Social and Cultural History of Broadcasting Technology) by Akira Fujitake et al. is a pioneering research that provides an overview of the development of broadcasting from the birth of radio broadcasting in the 1920s to the mid-1960s from the viewpoint of technology (Fujitake, Okamoto, Ishikawa 1975). But the book mentions few film-based programs and ends with the situation in the mid-60s. So this book is not very useful for research into TD.

author believes this is because the category of TD has not been identified in concrete words, which has made it difficult to acquire a viewpoint to see the whole picture.

The content of this article is as follows:

1. Introduction
2. Defining TD
3. Creating a chart of NHK TD
4. Technological environment and production methods
5. Coda

Chapter 2 will define TD by referring to past discussions. It will also identify images (documentary images) that characterize the category of TD. Chapter 3 will present a list of major regular programs, including documentary images, which were more than 20 minutes long and broadcast during primetime on NHK-General TV for more than a year. Chapter 4 will look at the following four technological developments that had significant impact on TD production methods.

- (1) Adoption of 16mm film (during early TD period in the 1950s)
- (2) Availability of synchronized sound recording (from the late 60s to early 70s)
- (3) Shift to VTR-based location shooting (from the late 70s to mid-80s)
- (4) Progress of digitization (since the mid-80s)

Needless to say, the technological environment is only one of many factors in TD production methods. But it's a surprisingly effective viewpoint to look at mid- to long-term developments. From this viewpoint, NHK's TD production methods since 1953 can be divided into four periods. This classification would be helpful for future TD researches.

- (1) Film Period first half (1953-1971)
- (2) Film Period second half (1972-1983)
- (3) VTR Period first half (1984-2003)
- (4) VTR Period second half (2004-)

NHK documentaries include audio documentaries (recorded sound composition texts) broadcast on radio, but this article looks at TD only. Audio documentaries will be discussed in another article.

*In this article, TD series such as “Nihon no Sugao” (Japan Unmasked) and “NHK Special” are called programs. Each episode in those series, such as “Nihon no Sugao: Nihonjin to Jirocho” (Japan Unmasked: Japanese and Jirocho) is called a text. When it’s obvious which series an episode belongs to, the series name will be omitted. Episodes that did not belong to any series and was broadcast on special slots will be mentioned with the text name only.

2. Defining TD

2-1. Definition of TD

TV documentary is one type of documentary. Defining documentary is considered difficult, but it must be done because without a definition, TD cannot be specified in a concrete way and researches into them will continue to be based on guesswork. The lack of definition also makes discussions on the whole picture of TD and those that link TD and other categories difficult.

The question “what is documentary?” has prompted various discussions. One argument is that it should be the guiding light of society. Another is that it should be a work of a specific individual. There also is an argument that it should not be a work of a specific individual but should be a record of objective facts. They are intended to find an ideal way for a documentary rather than defining documentary. “Creative treatment of actuality” (John Grierson)², “Revealing truths by presenting one fact after another” (Fumio Kamei)³ are some of the famous arguments. They reflect the specific viewpoint discussions that a documentary “should” be creative or reveal facts.

These arguments may be effective as production guidance and norms. However, they cannot be accepted as a definition for documentary to be used for researches for two reasons: Firstly, if we accept the definitions of Grierson or Kamei, there arises a difficult question of who will determine whether a documentary is creative or not, and whether it shows truth or not. Secondly, the author believes that treating programs that are not the guiding light of society, that are not very objective records or very creative, and those that avoid showing truth as documentaries will lead to more fruitful researches.

² It’s the definition by John Grierson, who first used the term “documentary” in the 1920s. The definition is found in a compilation of his critical essays edited by Forsyth Hardy (Hardy, ed. 1979, p11). *The Film Studies Dictionary* says all attempts to give a comprehensive definition to documentary faces difficulties, adding that Grierson’s “creative treatment of actuality” remains the simplest and most useful definition. (Blandford et al., 2001)

³ Fumio Kamei, who worked as director of documentary films from the 1930s is said to have told this to his son-in-law, whom he considered as his successor. (Omori 2017, p6)

Hitoshi Sakurai, who produced outstanding TV documentaries from the 1970s to the 2000s, defines documentary by breaking away from these “should” arguments. According to him, documentary is “a tool to let us understand ‘what kind of world we live in’” (Sakurai, 2005, vii). If we call the world we live in “reality”, documentary is a tool to understand reality. The author accepts this to define what is contained in documentary.

To study TD, it’s appropriate to remove “should” arguments from the definition of what is contained in documentary and define TD by format alone. In a previous article, the author presented four criteria conditions of TD in terms of format. (Miyata, 2018, p18)

- (1) TV text made up of images and sound
- (2) Not TV drama
- (3) Shows specific aspects of reality through location shooting (not filmed in the studio)
- (4) Edited after location shooting (not live broadcast)

TD is a tool to understand reality in terms of content and a non-drama TV text produced by location shooting and editing in terms of format.

The author has no intention of saying this is the only definition of TD. The author will follow Sakurai’s definition of content, but the definition of format could change. In recent years, TV texts made up of computer-generated images, not those filmed on location, are increasingly used as a tool to understand reality. These texts may be included in TD. But the aforementioned definition is effective to describe the development of the category that was born with the start of TV broadcasts in Japan in the 1950s and has been generally called “documentaries” up until now (this article was written in 2018).

This article aims to identify images (documentary images) that characterize the category of TD to make the definition of formats more detailed.

2-2. Identifying documentary images

Based on the definition presented in 2-1, the author calls images that meet the following four criteria documentary images.

- (1) Real-life images broadcast on television
- (2) Non-drama images

(3) Shot on location

(4) Recorded images that are due to be edited (no live broadcasts)

Chart 1 shows where documentary images fit in among various TV images. Using this chart, let's single out documentary images.

TV images are divided into real-life ones and generated ones. Subjects in real-life images are countless things and persons that exist in this world regardless of whether they are featured in TV production. On the other hand, subjects in generated images are created on paper or computer (cyberspace). They include letters such as titles and subtitles, charts and graphs and computer-generated imagery.

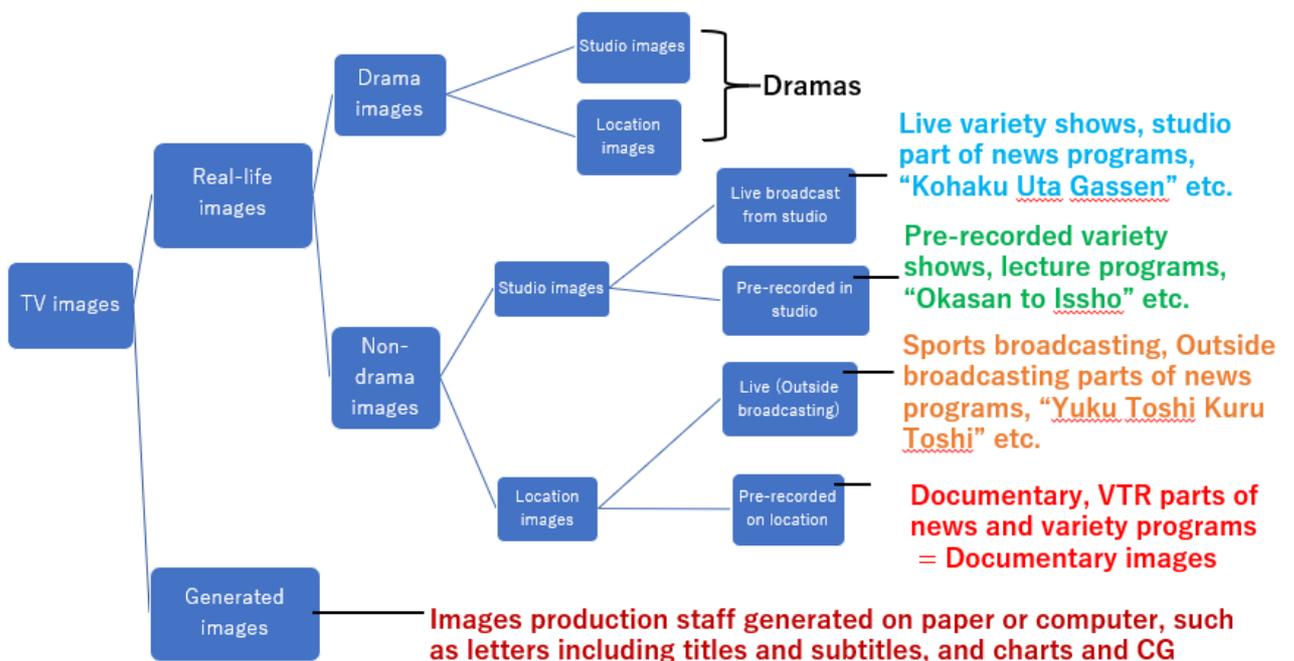


Chart 1 Documentary images in TV images

Subjects in real-life images have physical reality, which is not limited on paper or in cyberspace. Studio sets for dramas or other programs are created by production staff, but they also have physicality. So images that have such sets as their subject are real-life images. Subjects of generated images, on the other hand, can exist only on a specific medium such as paper or cyberspace.

Of generated images, letters such as titles and subtitles are included in almost all TV texts. Statistical charts and graphs appear on many TV texts. One type of TV text is almost entirely

made up of generated images. It's animation programs that were made with celluloid sheets in the past and with computer-generated images today. Animation texts in the past were mainly fictional stories for children, with popular titles including "Little Ghost Q-Taro" (TBS, 1965-1967 etc.) and "The Secrets of Akko-chan" (NET, 1969-1970). But since the mid-1980s, highly informative texts that use CG images to visualize things that cannot be seen in real life appeared. Major titles include "NHK Special Human Body: the Universe Within" (1989) and "NHK Special: Seimei 40 Okunen Harukana Tabi" (NHK Special Life: A 4-Billion-Year Journey) (1994-1995).

Although the number of TV texts mainly made up of generated images is believed to be increasing, most of TV texts at present are real-life images. Documentary images, which are an essential element of TD, are a type of real-life images.

Real-life images are divided into drama and non-drama images. What differentiates them is whether objects and persons shown in an image are projected by the production team as different objects and persons from themselves. (Miyata 2018, p18). For instance, the distinction is made depending on whether people appear as themselves or they are cast as characters. When actor Ryohei Suzuki appears as Takamori Saigo, whom he played in the 2018 NHK Sunday drama series "Segodon", it's a drama image because the production team acknowledges the dualness with subtitles etc. When there is no dualness (when Ryohei Suzuki appears on screen as himself), it's a non-drama image. Those that constitute TD are, of course, non-drama images.

Non-drama images are divided into studio images and location images, depending on where they are shot. Each is divided into two categories depending on how they are broadcast. One is live images, for which shooting and broadcasting occur simultaneously. The other is images recorded on film or videotape, edited and replayed in the form of a complete package.⁴

Let's start with non-drama, studio images. Live broadcasts of these images include variety shows and studio segments of news shows. "Kohaku Utagassen" (Red and White Singing Contest) is a typical live studio-based program. Studio-based, edited programs include recorded variety shows, entertainment performance and educational programs. "Okasan to

⁴ Replaying films or videotapes that have been completed as programs for broadcast. Such texts are called "Kanpuro" (Complete program package) at NHK and "Kanpake" (Complete package) at commercial broadcasters.

Issho” (Play With Mum), which has been on the air since 1959, is a typical studio-recorded program.

The category of non-drama, location-based images have live and recorded/edited images. Location-based images broadcast live are called “chukei eizou” (outside broadcasting images). They are used for news shows, sports events, Diet sessions and theater performances. Non-drama, location-based recorded images are TD. They include so-called VTR segments in variety and news shows. Documentary images, which characterize the category of TD, are non-drama, location-based images that are also real-life images shot to be edited.

The author calls the amount of time that documentary images have in a TV text “documentary level”. There are surprisingly few TD with a 100% documentary level. TD produced in the 1950s already featured generated images such as titles, subtitles and charts. Since the mid-1980s, the number of programs that use studio-based VTR inserts has been growing. Programs such as “Today’s Close-up” (1993-) use much more studio-based images than documentary images. The volume of documentary images has been declining because of more use of CG and other generated images in recent years.

In this article, texts with low documentary levels are treated as partial TD. The author’s interest is primarily in texts with high documentary levels, but those with 30% to 50% documentary levels are not excluded. If documentary levels have been falling for TD produced by NHK since the mid-1980s, it’s an interesting phenomenon.

2-3 Characteristics of documentary images

Compared to other non-drama TV images, documentary images have a distinctive feature: they can express diverse times and places.

Studio-based live broadcast and outside broadcasting images show what is happening in a particular place such as the studio and the site of location shooting when it is happening. Simultaneity and instantaneousness are big features of television. They can exist in exchange for limiting the timeframe and location to “here and now”.

Studio-based recorded programs show what takes place in the studio. Since they are not live, their timeframe is not limited to the present, but is limited to a short period in recent past. Its length does not exceed the time needed for studio shooting (it’s rare that the production team

records images whose length is more than twice the broadcasting time).

In contrast, documentary images capture various locations in various timeframes in real life. They cut out time for the length of shots and cut out space for the size of a camera frame to show what the world is at a given time at a given place. Audience can experience various times that are not “now” and various places that are not “here” and various people who live in different time and places from “me”.

Many researchers have pointed out that simultaneity and instantaneousness of live broadcasts are notable features of television. However, it’s also true that from the start, TV has had a lot of non-drama location-based images (i.e. documentary images) that do not have either of the characteristics. When NHK began full-scale TV broadcasting on February 1, 1953, a film text consisted of edited documentary footage was aired under the title “Eiga” (cinema) for 30 minutes from 3 p.m.⁵ TV texts made of edited images have been shot on location in various time and places to capture diversity in the world, have survived since the start of Japan’s TV broadcasting. They are NHK TD.

3. Creating a chart of NHK TD

In this chapter, a chart of major NHK TD from 1953 to 2018 will be presented.

Yoshiyuki Niwa made a similar chart (Niwa 2011, p16-19). His “linealogy” includes, in his own words, “not only documentaries in a strict sense but also studio-based news shows, magazine shows and general knowledge programs.” (Niwa, 2011, p15). It’s all-encompassing and effective, but seems too wide-ranged for TD studies. The chart in this chapter uses the definition of TD as stated in the previous chapter and narrows down the list of programs by limiting the channels and time slots as shown in 3-1. The chart will also show chronological development in accordance with the topics as presented in 3-2.

3-1. TD to be included in the chart

NHK produced and broadcast a huge number of TD texts from 1953 to 2018. It’s impossible to cover all of them and there’s no need to do that. Chart 2 gives an overview of the development of NHK-General TD.

⁵ According to the program list, “Eiga” was consisted of “NHK television news film” and “Live commentary for the inauguration ceremony of President Dwight Eisenhower”. Neither was NHK’s original production. The former was bought from Nichiei Shinsha and the latter from Voice of America.

The author set the conditions for TD to be included in the chart as follows:

- (1) TD series (documentary programs) broadcast nationwide on NHK-General TV
- (2) Broadcast during primetime (7 p.m.-11 p.m.), including programs that began at 10:55 p.m.
- (3) Broadcast as weekly or more frequent regular program for at least a year
- (4) More than 20 minutes long
- (5) Not studio-based

The first four conditions are set because TD that meet them are likely to have had more audience than others, and therefore highly representative as NHK TD. The author is well aware that there are many important and high-quality TD that were broadcast on other time slots or other channels such as NHK-ETV and NHK-BS channels, broadcast biweekly, monthly or on special slots and those shorter than 20 minutes long. Some of the standalone documentaries attracted many viewers, but they are excluded for the sake of simplicity. However, TD that are not in the chart may be mentioned in this article when necessary.

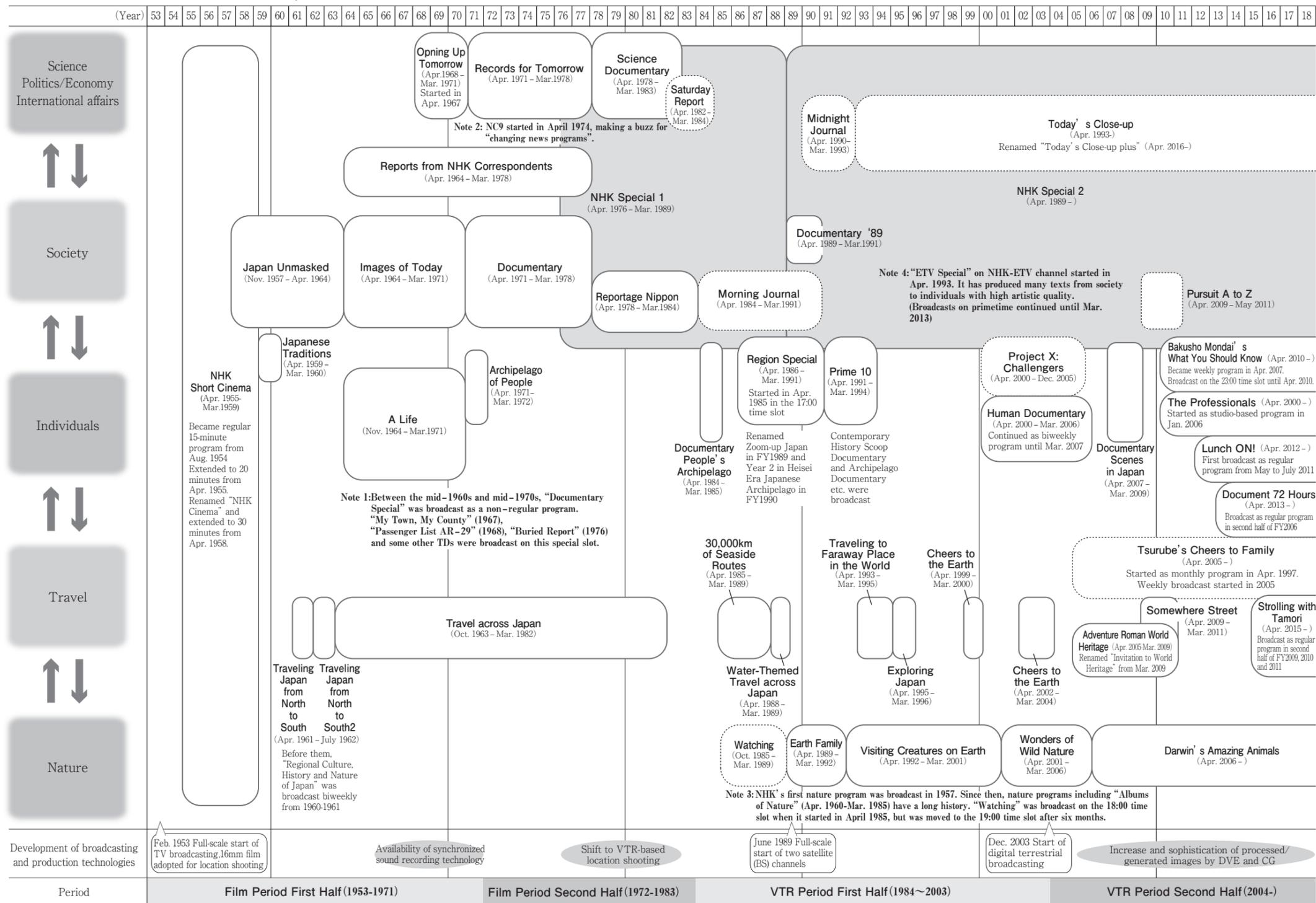
The last condition (not studio-based) is not thoroughly applied. The main interest of this study is TD with high ratios of documentary images. Studio-based TD have lower ratios, and the author's interest in them is secondary. Studio-based partial TD are omitted in principle.

But as exceptions, "Ohayo Janaru" (Morning journal) (1984-1991), "Today's Close-up" (1993-), "Project X: Challengers" (2000 – 2005), "Tsurube no Kazoku ni Kanpai" (Tsurube's Cheers to Family) (1997- as regular program) are shown with broken lines (programs shot entirely on location are circled with solid lines). They've all drawn great responses from viewers and are considered important to look back the development of TD since the 1980s. The chart has a supplementary note on "Nyusu Senta Kuji" (News Center at 9) (1974-1988). This groundbreaking news show featured many documentary images and is considered to have had significant impact on TD production methods (see 4-1-2).

"NHK Tokushu" (hereinafter referred to as NHK Special 1) (1976-1989) and "NHK Supesharu" (as NHK Special 2) (1989-) have had many studio-based texts. But since using solid and broken lines on the same location is impossible, the program is shown with solid lines and treated as a non-studio-based TD for the sake of convenience.

Chart 2
Development of NHK TV documentaries

(Created by Akira Miyata)



The chart shows regular documentary programs broadcast on NHK-General TV between 1900 and 2300 (including those that began at 22:55), which are more than 20 minutes long and broadcast for at least a year. Programs shown with solid lines are shot entirely on location. Those with broken lines are studio-based. The horizontal axis shows the chronological development from 1953 to present. The vertical axis shows the topic category featured in each program. Generally, programs in the upper parts of the chart handle abstract topics (politics, economy, society) and those in the lower parts handle concrete topics (individuals, community, nature). "NHK Special 1 and 2" are shown with shaded framed for the sake of readability.

3-2. Chronology and topic category

The duration of each program in the chart is based on NHK Almanac. The horizontal axis shows the years from 1953 to 2018. The vertical axis shows the topic category each program handled.

By topic category, TD are divided into those about politics and economy, those introducing science and technology or analyzing various phenomena from scientific viewpoints, those handling social issues, crimes and accidents, those focusing on individuals, those featuring specific regions or locations, and those focusing on natural wonders and appeals. Programs on the upper part of the chart deal with relatively abstract topics (politics, economy, science, society), while those in the lower part handle more concrete topics (individuals, locations, nature). Abstract topics have affinity with language, while concrete topics have affinity with images.

“NHK Special 1” and “NHK Special 2” covers wider topic categories than those shown in the chart, but they are treated as one that mainly deals with social issues for the sake of convenience.

At the lower part of the chart, the development of broadcasting technology and program production technology that are thought to have had fundamental impact on the development of NHK TD. At the bottom, the years from 1953 to 2018 are divided into four phases from the viewpoint of the technological environment in which the technological development occurred. They will be explained in detail in the next chapter.

4. Technological environment and production methods

In this article, the technological environment refers to the overall technological situation surrounding TD production. Its main factors are broadcasting format (analog/digital), equipment used for image/sound recording and editing (camera, recorders, editing machines), recording media (film, videotape) and staff who are involved in these factors.

This chapter explains four technological developments that have had significant impact on the production methods of NHK TD from its start to the present (4-1). Then, the developments of NHK TD from 1953 to 2018 will be divided into four periods from the viewpoint of the technological environment (4-2). Lastly, the outline of each period will be presented (4-3).

4-1. Four technological developments and production methods

There are many researches into TV broadcasting and program production technology from the purely technological viewpoint. There also are some studies that focus on the relations between particular technology and particular production method. However, there is no research in Japan that looks into the relation between technology and production method chronologically and systematically. This is probably because no one tried to shed light on the mid- to long-term development of TD production methods.

The author thinks that the following four technological developments have had significant impact on the production methods of NHK TD.

1. In the initial period of TV broadcasting, 16mm film was adopted as the medium for recording documentary images. (Adoption of 16mm film)
2. From the late 1960s to the early 1970s, the technology to record images and sound in synch on location became available. (Availability of synchronized sound recording)
3. From the late 1970s to the early 1980s, videotape replaced 16mm film as the main recording medium. (Switch to VTR location shooting)
4. Since the mid-1980s, digitization progressed in the whole production process from location shooting to broadcasting. (Progress of digitization)

These four technological developments were groundbreaking in that they created a technological environment on which all TD producers at NHK depended for more than a decade and helped establish production methods that are suitable for each technological environment. By focusing on these technological developments, it becomes possible to divide more than 60 years of NHK TD developments from a macroscopic viewpoint.

Let's take a look at each development.

4-1-1. Adoption of 16mm film

In the initial period of TV broadcasting, NHK's first TD producers chose 16mm film as the recording medium of documentary images and started shooting on location using 16mm film cameras. TD images started as something different from cinema images, which are shot with 35mm films, and TV programs of other categories that basically don't use films.

According to a recollection by Noboru Omine, who was head of the production headquarters

at major news film company Nippon Eiga Shinsha, an NHK executive visited him in the summer of 1952 to ask for help for TV program production, saying that staff at NHK who had worked only for radio had no idea how to deal with images (NHK Sogo Hoso Bunka Kenkyusho, Bangumi Chosahan, 1978).⁶ With recommendation from Omine, two film cameramen (Masaru Tabata and Takeshi Miki) and one film editor (Shuzo Sasaki) joined NHK by the summer of 1953. They had built careers in the field of news and culture films. Omine himself joined NHK in October that year as an executive of the film division of the television department, which was founded in July that year.⁷

It's been said that NHK decided to use 16mm film as the medium of location-based images with Omine's recommendation. 35mm film was used for cinema for theater releases, including new and culture films. People in the cinema industry considered 16mm film as a medium for amateurs. However, he persuaded NHK executives and engineers to adopt 16mm film, citing mobility and affordability compared with 35mm film (NHK Sogo Hoso Bunka Kenkyusho, Bangumi Chosahan, 1978 and "NHK Hodo no Kiroku" Kanko Iinkai, 1988, p188).

The film division led by Omine, Tabata, Miki and Sasaki played the main role in producing "NHK Tanpen Eiga" (NHK Short Cinema) (1954-1959). The program, made up of 16mm film images, is NHK's first regular TV documentary.

Many of the program's texts kept at NHK Archives start with the title "NHK Television Cinema" as shown in Chart 3. This title was also used for others including special program "Yama no Bunko no Kiroku" (Records of a branch school on the mountain) (1959, 1960). At least until around 1960, "television cinema" referred to a category rather than the title of each program. NHK used "television cinema" as the name of a category that precedes or exists abreast of "television documentary".

⁶ This text material is a seven-volume collection of interviews whose title roughly translates as "Accounts by people who worked in the early period of TV broadcasting". An interview with Mr. Noboru Omine that was conducted on January 25, 1976, is in Volume 2.

⁷ NHK founded the television department in an organizational change in July 1953. The division existed in parallel with the radio department for four years. In June 1957, NHK changed its organizational structure from the previous division based on medium (TV/Radio) to a division in accordance with category such as education, arts and news. Film camera crew and other staff at the film of the television department were reassigned to the domestic news division of the news department and the film section of the operational division at the programming department. (From "NHK job system")



Chart 3 Title of “NHK Television Cinema”

TV broadcasting was live in principle in the initial period. The core TV technology is to convert the image and sound of a subject into electrical signals the moment they are acquired, instantaneously transmit them on radio waves to wide areas. On the other hand, film images are optical signals that cannot be directly transmitted on radio waves. In order to broadcast film images, films need to be developed and optical signals need to be converted into electrical ones using the technology called Telecine. In the world of television, electrical signals that can be transmitted on radio waves instantly is the “standard language”. Optical signals of film images are a “dialect”.

There was no need to use film cameras if it was possible to bring TV cameras that can instantly convert images into electrical signals to various locations to shoot and record images. However, TV cameras at the time lacked mobility. Neither videotape, which can record images as electrical signals, nor videotape recorder (VTR) existed in Japan until 1958 (Sony ed., 1996, p108).⁸ After 1958, it became possible to record studio-based images on videotapes. But one videotape, which was 2 inches wide, was worth an annual income of a salaried worker (NHK ed., 2008, p13). A VTR was more than 100 times the price of videotape and it was about the size of “two chest drawers”. It was unthinkable to bring it to location shooting.

Sony developed a relatively affordable VTR-based TV camera, with which images and sound are recorded on half-inch-wide videotapes, in 1981. Two years later, the maker rolled out an editing machine that enables easy editing of videotapes (Sony ed., 1996, p196). Film images,

⁸ U.S. company Ampex developed the world’s first mass-market VTR, which used two-inch-wide videotapes, in 1956. NHK bought its first VTR in May 1958. According to Sony’s corporate history, the VTR was as large as “two chest drawers” and cost 30 million yen (Sony ed., 1996, p109, 153). At that time, the average monthly wage of a company worker was 16,608 yen, according to labor ministry statistics in 1958.

a “dialect”, existed for about 30 years from 1953 in NHK television and became the technological foundation of the expression form of TD.

4-1-2. Availability of synchronized sound recording

Location shooting became far easier with 16mm film cameras than with 35mm film cameras. But 16mm film images posed a big problem that didn’t arise with ordinary TV images. Sound recording during filming was difficult, which meant that images and sound obtained on location didn’t synchronize.

In live TV broadcasts, the movements of the announcer’s mouth and voice always synchronize (lip-synching). This is because a TV camera and a microphone in the studio convert images and sound into electrical signals and they are transmitted on radio waves simultaneously. In contrast, it was usually the case that lip-synch didn’t occur for TD produced until the mid-1960s, such as “Nihon no Sugao” (1957-1964).

The reason was noise from film cameras. The main models used at that time were Filmo (Photo 1) and Arriflex 16ST (Photo 2). Their motors generated loud noise, making it basically impossible to record sound during filming.



Photo 1 Filmo



Photo 2 Arriflex 16ST

Chart 4 analyzes past NHK TD texts focusing on human voices. The bars above the horizontal line show the percentage of human voices obtained on location. The bars below the line show the percentage of narration added by the producer during editing.

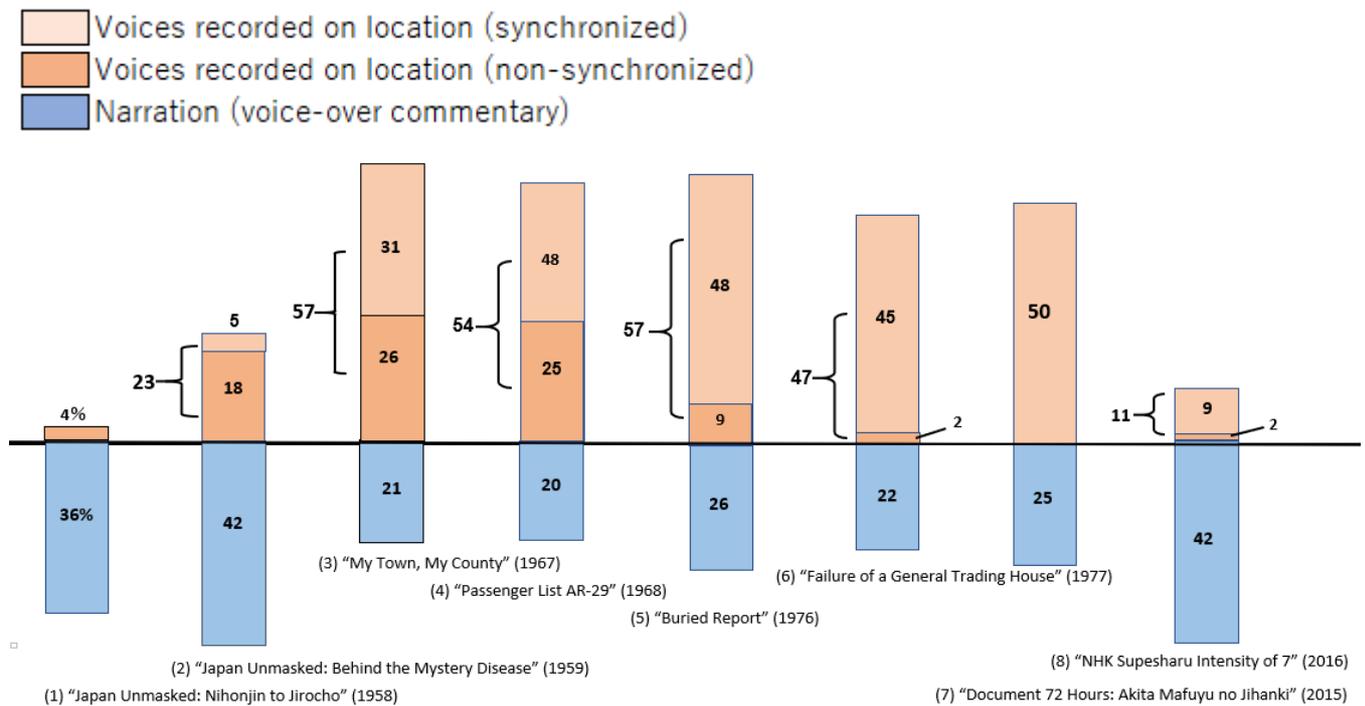


Chart 4 Structure of human voices in NHK documentaries

As shown in Chart 4-1, most of the human voices in “Nihon no Sugao Nihonjin to Jirocho” (Japan Unmasked: Japanese and Jirocho) (1958) are narration by an announcer. Voices of subjects obtained on location accounted for just 4% of the broadcasting time. In another episode in the program, “Kibyō no Kage ni” (Behind the mystery disease) (1959), voices obtained on location accounted for 23% of the time, but narration accounted for 42% (Chart 4-2). Though on different degrees, many TD texts until the mid-1960s had more narration than voices obtained on location. The main reason was that synchronized sound recording with the aforementioned cameras were impossible.

Two technological approaches were made to achieve synchronized sound. The starting point for both was to develop cameras that would generate as little noise as possible. One approach is the single system that records images and sound on the same film, while the other is the double system that uses a camera to record images on film and records sound on magnetic tapes by a recorder.⁹

Here’s how the single system works.

⁹ A book by Hiroshi Aida (Aida 2003, p112-p117) and *NHK Satsuei Dokuhon* (NHK Filming Handbook) (NHK ed., 1980) provide easy-to-understand explanation of the single and double systems. The latter is written by NHK camera crew who were involved in the production of film documentaries for years. The crew explained shooting techniques during the film era and their experiences on location.

A single-system camera existed since the mid-1950s in Japan. This model was called “Oricon” (Auricon). Its motor was covered with a metal box (blimp) to reduce camera noise, and sound was recorded on a magnetic substance applied on the edges of a film.¹⁰ But Auricon had problems with mobility and operability, so it was used only for indoor interviews at the Diet or news conferences etc. It wasn’t used widely for TD. Despite the poor mobility and operability, Auricon was used for the documentary series “Aru Jinsei” (A life) (1964-1971), which focused on delivering the voices of subjects on location, until around 1967. (“Aru Jinsei” Seisaku Sutafu, 1965, p37-p39, Aida 2003, p80).

Canon Sound-Scoopic, a single-system film camera that was lightweight and with less camera noise, was developed and started to be used for news reporting from around 1970. But this camera wasn’t completely noiseless and didn’t achieve complete synchronization of image and sound¹¹, so it wasn’t used for long TD. In the field of TD, the double system that uses a noiseless camera and a sound recorder to achieve complete synchronization became the mainstream from around 1967.

Now let’s take a look at the double system.

Since the mid-1960s, lightweight and noiseless film cameras Éclair NPR (Photo 3) and Arriflex BL became available. In 1966, a recorder that can completely match the recording timing of image and sound (it was called Nagra from its produce name: Photo 4) hit the market. By using these, complete synchronized sound recording became possible¹² and the system was widely adopted by NHK TD production by the early 1970s.

The double system enables camera and sound crew to move freely without connecting their camera and microphone with cables. Images are shot on film and sound on magnetic tape separately.¹³ Editing was done with a double-system editing machine (called “Steenbeck” from its manufacturer; Photo 5 and 6) that can run films (images) and magnetic tapes (sound) at the same time.

¹⁰ Initially sound was recorded as optical signals on the edges of a film, but quality was low and the method was changed to magnetic recording.

¹¹ Inside the camera, the location where a film was exposed was a little away from the magnetic head where sound was recorded. This resulted in a slight but inevitable gap between the timing for image and sound recording. For more, refer to Ito, 1976, p636.

¹² Technology for recording pulses sent from a crystal oscillator on a film and a magnetic tape to synchronize them enabled complete simultaneous recording. (Ito 1976, p636)

¹³ On location, sound was recorded on 6mm-wide magnetic tapes. But editing was done by dubbing the sound on magnetic tapes (cintape) that had the exactly same form as 16mm films.



Photo 3 Eclair NPR



Photo 4 Nagra III recorder



Photo 5 Steenbeck editor: Whole

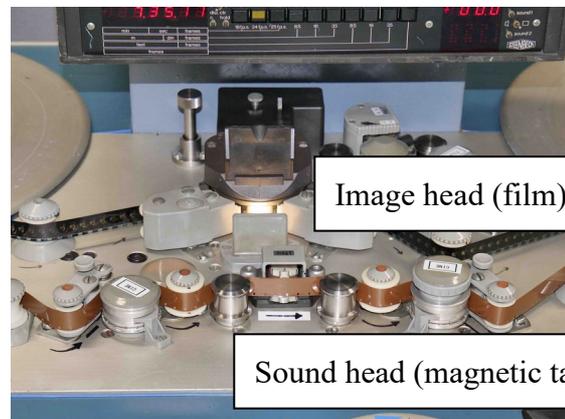


Photo 6 Steenbeck editor: Part

Like the shift from silent cinema to talkies, the availability of simultaneous recording technology had a big impact on TD and news program production methods. Firstly, production staff became able to use sound recorded on location freely, which enabled them to reproduce the time and place where the images were shot, giving a more realistic feel to the programs. Secondly, TD became able to feature linguistic and abstract topics that had been considered unsuitable for visual presentation. This is because individuals on location started to have clear voice that synchronizes with their images. Lip-synching made it possible to show that the person on screen is speaking exactly what the audience is hearing. Voices from location sites began to have far greater evidentiality.

In the late 1960s, when the double-system synchronized sound recording technology was spreading, outstanding documentaries were produced with rich and skillful audio expressions that made full use of voices obtained on location.

“Wagagun Wagamachi” (My Town, My County) was produced and broadcast in 1967, and won the cinematography and sound recording awards of the Japan Television Engineering Awards. It featured both synchronized and non-synchronized sound. Director Toshiki Kudo used lip-synching for individuals who spoke about topics with high level of evidentiality such as their experiences around the war. On the other hand, he used non-synchronized voice (voice without showing the speaker’s face) in scenes that depicted the community and people living there. Subjects’ voices recorded on location accounted for 57% of all human voices in the program, exceeding narration’s 21%. Of the voices recorded on location, 31% were synchronized and 26% non-synchronized (Chart 4-3). The double-system created this documentary masterpiece that showed a multilayer of past and present of a seemingly peaceful small town in Tohoku and rich feelings of its residents in a polyphonic way.

“Josei Meibo AR-29” (Passenger list AR-29), produced and broadcast in 1968, won the best cinematography and best sound recording awards at the Japan Television Engineering Awards, and the Art Encouragement Prize at the National Arts Festival. It is very thought-provoking through realistic images and voices of people who boarded an immigration ship for Brazil with a lot of dreams and those who boarded a return ship after their dreams were broken. Director Yutaka Aida appeared to have used synchronized sound recording for almost all voices in the program to give us a you-are-there feeling. But he actually employed various editing methods such as “ekabuse” that uses multiple images for a single sequence of voices recorded on location, and “sound insert” in which a voice is used for an image shot on a different location. Like “My Town, My County”, voices recorded on location accounted for 54% of the total, surpassing narration’s 20%. Synchronized sound (29%) and non-synchronized sound (25%) were almost equally used. (Chart 4-4)

The double system enables production staff to decide whether or not to synchronize images and sound by carefully considering their chemistry for each scene. In the single system, images and sound are synchronized by default. It’s difficult to use sound recorded on location as non-synchronized sound.¹⁴ In that sense, the double system is more suitable than the single system for more diverse expressions of reality.¹⁵

¹⁴ Non-synchronizing them is difficult because sound is recorded on the edges of films on which images are recorded. It’s impossible to cut the films lengthwise to separate images and sound.

¹⁵ Hidefumi Kimura was a famous director at RKB Mainichi Broadcasting and he preferred the double system. According to him, Steenbeck is an editing machine that “can breathe life into unremarkable words.” Kimura liked “to bring out interviewees’ personality and nuances rather than clarifying the point of their comments”. He said he “starts to decide on the focus of a program during editing.” (Kimura 1978, p26).

In the mid-1970s, synchronized sound recording technology began to change news programs and journalistic TD. News programs handle a wide range of linguistic and abstract topics such as politics, economy and complex social issue. The technology opened a way for the parties involved in those linguistic and abstract topics to speak with their own voices, bringing innovations to news programs. “Nyusu Senta Kuji” (News Center at 9) (1974-1988, hereinafter referred to as NC9) was the pioneer of an full-scale news show in Japan. Its technological foundation was synchronized sound recording.

News programs before NC9 featured announcers simply reading out scripts. NC9 focused on reporting from where news broke and hearing from people in the news (NC9 production team, 1977a, p 42). Its stance was seen in the bold adoption of voices of people on location and those of reporters and directors at the scene. There’s no need to explain that this presentation couldn’t exist without synchronized sound recording technology. An article in the August 1977 issue of “Hoso Bunka” (Broadcasting Culture) shows that production staff used the double system, which takes more time but enables them to separate images and sound and edit them freely, in the initial period of NC9 (NC9 production team, 1977b, p42).

NC9 spearheaded the use of reports from the scene. It developed into an investigative reporting method for long TD, in which reporters appear on screen and speak on the scene as they try to find out the truth. The late 1970s saw several outstanding investigative reporting programs. They include “Umoreta Hokoku: Kumamoto-ken Kobunsho no Kataru Minamatabyo” (Buried Report: Minamata Disease seen from official documents of Kumamoto Prefecture) (1976, winner of the National Arts Festival Grand Prize) and “NHK Tokushu: Aru Sogo Shosha no Zassetsu” (NHK Special: Failure of a General Trading House) (1977, winner of an award from the Japan Newspaper Publishers and Editors Association). The latter was praised as a groundbreaking TD that pioneered investigative reporting on politics and economy (NHK ed., 2001, p101). In both programs, reporters appeared on screen, made comments and asked questions to people who held the key to the issues.

In “Buried Report”, NHK reporter Konosuke Oharu shed light on how businesses and authorities evaded their responsibilities and failed to help the victims when Minamata Disease first became a remarkable social issue in 1959. People involved were reluctant to speak, but Oharu patiently continued interviewing them to draw out information. Exchanges between Oharu and interviewees accounted for 57% of the total sound, far exceeding narration’s 26%.

About 70% of the narration were made by Oharu himself (Chart 4-5).

“Failure of a General Trading House” looked into how Japan’s ninth-largest general trading house collapsed with a massive overseas loan. Like “Buried Report”, interviews and other voices recorded on location accounted for 47%, outnumbering narration’s 22% (Chart 4-6).

Unlike the texts produced by Kudo and Aida in the late 1960s, almost all voices recorded on location for the two documentaries were synchronized with images. Non-synchronized voices accounted for less than 10%. All reporters and interviewees showed their faces on screen. They are proof that evidentiality of voices recorded on location is important for producers of investigative reporting programs.

4-1-3 Shift to VTR-based location shooting

Between the late 1970s and the early 1980s, the recording medium was changed from 16mm film to videotape, and cameras used for location shooting were switched from film cameras to VTR cameras. It was a shift to VTR-based location shooting. Recorded images changed from optical signals to electrical signals. The recording method for images and sound changed from the double system to the single system, in which both images and sound are recorded in synchrony on videotape. This technological development had a massive impact on the production method of TD.

The impact of VTR-based location shooting on TD production method can be described in five points.

- (a) Location shooting became easy and objective
- (b) Cameraman’s roles changed
- (c) Unified recording of images and sound became the norm
- (d) TD became similar to other program categories and the number of partial TD increased
- (e) Digital technology made image processing and image creation easy

- (a) Location shooting became easy and objective

The introduction of VTR cameras made shooting easy.

Operating a film camera required skills to adjust focus and light intensity etc. But in a VTR camera, many of these operations are automated. A numerical change that is easy to see is that a VTR camera has longer recording time. A reel of film (100 feet) can record images for less

than three minutes. There was a model that enabled users to add magazines to store four reels. But the recording time was extended only to around 10 minutes. Since videotape can record 20 minutes, much longer takes became possible. It was particularly effective for recording interviews.

VTR cameras also made shooting work objective. In the era of film cameras, the only person on location who knew what images were being filmed was the cameraman. A VTR camera can be connected to a monitor to allow the director and other staff to watch. Also, in the film era it was impossible to see whether intended images were taken until films were developed. But with a VTR camera, images can be checked just by rewinding the tape. It means that production staff can watch images on location or at their accommodations.

(b) Cameraman's roles changed

As stated, the shift from film to VTR made shooting work easy and objective. This means the role of a cameraman in TD production shrank in a relative sense.

In the film era, a cameraman had to carefully choose when to film because of the short recording time. That means a cameraman effectively edited images on location.

Films were expensive and could not be reused. So it was desirable in terms of economy that a cameraman strictly chose chances to film. "Shin Nihon Kiko" (Travels across Japan) (1963-1982) was one of the most notable film documentaries. For each of its 29-minute episode, the production team was allowed to use up to 40 film reels (4,000 feet) (NHK ed. 2007, p5). With one reel being capable of recording 2 minutes, 40 seconds (160 seconds), the production team could record 6,400 seconds in 40 reels. That was about 3.7 times the broadcasting time (29 minutes are 1,740 seconds).¹⁶

Videotape can record longer than a film reel could. Videotapes are cheaper and reusable, imposing fewer financial restrictions on production. Since the late 1980s, camera crew who had worked in the studio or for outside broadcasting with no experiences in film-based location shooting (i.e. they had no experiences in strictly choosing filming chances) started to take part in VTR-based location shooting. It was no longer unusual that shooting time became 20 times the broadcasting time (e.g. to use a 20-minute videotape to shoot one minute

¹⁶ Color films that began to circulate around 1967 were especially expensive (10,000 yen per reel). Camera crew was reportedly told to limit the use of color films to 30 reels. (NHK ed. 2007, p21)

broadcast).

The shift to VTR has made camera crew stay away from the editing room. In the film era, many cameramen came to the editing room to check the images they had shot because they couldn't see the images on location. They were often involved in the editing process.

At that time, the word “all” meant taking part in the entire production process. Camera and sound crew often said they are “not parts, but all”.¹⁷ However, in the VTR era, “all” became less frequent and camera and sound crew didn't come to the editing room that often. Camera crew played a role as editors in the film era, but their involvement in the editing process was significantly reduced in the VTR era.

It's worth mentioning that film camera crew at NHK were conscious about the change in their roles brought by the introduction of VTR. Crew who belonged to the camera reporting division of the news department who worked for news programs and TD produced by the department, and crew who belonged to the filming division of the production operations department and worked for TD production by the education department¹⁸ resisted the introduction of VTR, arguing that it would reduce the degree of independence of their work and their artistic role.¹⁹ NHK introduced VTR for its news programs and TD several years after commercial broadcasters did. One of the reasons for the delay was resistance from film camera crew.²⁰

(c) Single-system recording of images and sound became the norm

¹⁷ From an interview with Mr. Takeshi Matsubara on June 26, 2018. The former NHK cameraman has been active since 1963 mainly in the field of TD.

¹⁸ It was established in 1957 along with the entertainment and news departments. The three departments were integrated into the general broadcasting department in 1973, but were revived in 1977 by merging with the former entertainment department. Renamed the production department in 2006.

¹⁹ In 1977, cameramen who belonged to the news department's camera reporting division held a discussion without disclosing their identities for in-house publication “Hareshon” (Halation). They expressed concern that the introduction of VTR cameras would make their skills unnecessary and make them “mere carriers” of the camera. (NHK ed. 2010, p2522-2529). Concerns about VTR cameras were also strong at the filming division of the production department. “Filming division's first video project” was launched in October 1975, but the “trial period” continued for long. According to Tadashi Eguchi, the ratio of VTR-based programs by the filming department reached 50% in April 1983. (Eguchi 1984).

²⁰ Another reason was equipment. Until around 1981, VTR-based location shooting had less mobility than film-based location shooting. When calls for a shift to VTR started in 1975 or 1976, production staff had to load a huge VTR that uses two-inch-wide videotapes onto a vehicle and connected the VTR to a camera with cables. From around 1979, 3/4-inch cassette videotapes became compatible with a portable VTR. But it required a person who will carry the VTR along side the cameraman. The adoption of VTR rapidly progressed after 1982, when VTR cameras that used half-inch cassette videotapes arrived at NHK.

VTR-based location shooting changed the way sound was recorded on location. With the introduction of VTR, the double system that recorded images and sound on different media disappeared. The single system, which records both images and sound on the same videotape, became the norm.

In the double system, a camera and microphone were not connected with a cable. Camera and sound crew moved separately to seek “good images” or “good sound”. One film reel was able to record only less than three minutes, but a 6mm-wide recording tape was able to store 15 minutes’ worth of sound. So sound crew often used Nagra to record sound on location even when the camera wasn’t rolling. In interviews and other occasions, it was often the case that sound crew turned on Nagra first and the camera crew began to shoot when they got images they wanted.²¹

But in the single system, sound can be recorded only when the camera is rolling. A camera and microphone are connected, forcing sound crew to follow the movements of a cameraman. Independence and originality of sound on location greatly reduced. Locations where “good images” and “good sound” can be found do not necessarily match. This technological development was probably unsatisfactory to sound crew who were eager to record good sound on location.

The single system was also adopted for editing.

As stated before, images and sound were recorded on different media (film and magnetic tape) in the double system and existed in parallel on an editing machine. Editors were able to choose whether to synchronize them or not.

But in the single system, images and sound are recorded on the same videotape and synchronized by default. It was technically possible to de-synchronize images and sound using functions of a video editing machine such as video insert and audio insert. However, the change in the audio recording system on location had made it difficult to obtain sound that was powerful enough to be used independently. Some sound crew used 6mm tapes or DAT²²

²¹ From an interview with Mr. Takeshi Matsubara (On October 26, 2018). Sound was often recorded before images were shot during film-based location shooting partly because of economic reasons. Films were expensive and not reusable. On the other hand, magnetic tapes for recording were cheap and reusable.

²² Stands for Digital Audio Tape. It started to be used from the late 1980s as a replacement of 6mm tapes as a

to record sound independently from the camera and provided it to directors during the editing process²³. But those media were incompatible with video editing machines. Editing machines used during the double system era had been removed. The technological environment to make use of sound recorded independently on location had almost been lost.

The single system that synchronizes images and sound by default is suitable for journalistic TD, which aim to explain the complexity of reality with words that have high levels of evidentiality. As proved in “Buried Report” and “Failure of a General Trading House” produced in the film era, showing people’s faces on screen is important for investigative reporting. And to achieve this, the single system is sufficient. The double system makes multimodal approaches to the subject and enables non-synchronized presentations of images and sound to show reality as “rich mystery”. But for producers who want to solve “mystery” of reality with words with high levels of evidentiality, this function is just unnecessary or over-performance.

Producers who wanted to describe reality beyond its seemingly peaceful surface with multilayered and polysemous ways might miss the disappearance of synchronized sound recording technology under the double system. The technological foundation for “My Town, My County” and “Passenger List AR-29” shrank.

(d) TD got close to other TV program categories and the number of partial TD increased

The shift from film to VTR reduced the originality of TD in terms of both images and sound, and held the category get close to other TV program categories such as news and variety.

It’s well known that the wide availability of VTR-based location shooting brought about drastic changes to TV news. “Nijusseiki Hososhi” (History of 20th Century Broadcasting”) links the spread of VTR-based location shooting with innovations of TV news, which was brought about with the arrival of ENG (Electronics News Gathering). (NHK ed., 2001, Vol. 2, p46-48).

The core of ENG is the technology that transmits images shot on a VTR camera on location to the broadcasting station using a simple microwave FPU (Field Pickup Unit). This technology

sound recording medium.

²³ From the author’s personal experience in the early 1990s.

enabled TV news production staff to obtain outside broadcasting images and documentary images far more swiftly and in far larger volumes.²⁴

With the arrival of ENG, news programs became closer to TD. Long live news shows presented by a newscaster in the studio and featuring outside broadcasting images and documentary images from various locations took root. Although “NC9” (1974-1988) began in 1974, ENG that became the norm since the late 1970s played a decisive role in making the program become a household name.

News shows eventually began to include TD that lasted for several to more than 10 minutes, which were called “specials” or “feature stories”. Documentary images used to have time lag between when they were shot and when they were broadcast. But they began to be used in massive volumes for news programs, for which “nowness” is crucial.

TD became closer to news programs, too. The changes explained in (a) to (c) all helped lay the groundwork for this. Film camera crew, a proud user of a “dialect”, had shrinking roles in TD production. Also, long TD started to use the single system like news reporting. With TD and news programs adopting videotapes as their recording medium, the barrier between them suddenly lowered.

Since the 1980s, a growing number of TD have introduced studio-based live broadcasting parts with anchorpersons served as emcees, inserted with several VTR parts. Such studio-based VTR-inserted TD included “Doyo Ripoto” (Saturday Report) (1982-1984), “Ohayo Janaru” (Morning Journal) (1984-1991), “Today’s Close-up” (1993-). NHK TD in the film era were mostly made up of documentary images shot on location, like “Travel around Japan” (1963-1982). All-location TD survived after the introduction of VTR, but the number of partial TD programs increased. In those programs, documentary images (VTR parts) were supervised by journalistic people in the studio.

The adoption of VTR for location shooting didn’t only make TD closer to news programs. Documentary images began to be used widely for variety programs. Nippon TV started “24 Hour TV: Love Saves the Earth” in 1978. Such ultra-long variety programs were made

²⁴ With FPU, images were sent only from locations with unobstructed views. In the 1990s, SNG (Satellite News Gathering) that uses communication satellite became available, making it possible to transmit images “from anywhere, instantly”. (NHK ed., 2001, Vol. 2, p48)

possible because outside broadcasting images and documentary images can be sent from a live-broadcasting studio.

The adoption of VTR progressed from the late 1970s to the early 1980s. It lowered barriers between traditional TV categories such as drama, documentary and news. It led to the birth of long-hour programs that is centered on a live-broadcast studio and features various categories that are broadcast in the form of VTR or outside broadcasting. In other words, department-store style programs became popular as long-hour news shows or variety shows. These programs can be called “TV as an empire”. At the summit of the empire are newscasters for news programs and comedians or other TV personalities for variety shows.

(e) Digital technology made image processing and image generation easy

Images shot on VTR are electrical signals. Compared to the film era, it became far easier to process images or generate images that are hard to obtain through location shooting.

NHK first introduced the DVE (Digital Video Effect) system that was capable of three-dimensional processing in 1984 (NHK ed., 1985, p284). Recorded images (electrical signals) are imported into a computer as digital data for processing. Processing including slow motion, still, fast-forward, slide-in, wipe, reduction and enlargement, composing multiple screens, blurring and mosaic processing was made much easier than in the film era.

Digital technology also made it easier to generate images that are difficult to obtain on location in the form of computer graphics. “NHK Tokushu 21 Seiki wa Keikoku Suru” (NHK Special: Warning from the 21st Century) (1984) featured CG character Dr. Horon as presenter. The program is said to have spearheaded the use of CG.²⁵

With the shift from film to VTR for location shooting, processing documentary images and using CG for statistical charts became common. DVE and CG technologies advanced in parallel. Production staff didn’t just use CG but DVE helped them use real-life images and CG together. In many cases, it was difficult to tell which is real-life and which is CG.

²⁵ From an interview with Mr. Kazuya Fujii and Mr. Koji Matsunaga from “Behind-the-Scenes Interviews” on the NHK Archives website.

<https://www2.nhk.or.jp/archives/search/special> (Retrieved on November 15, 2018)

4-1-4 Progress of digitization

Since the introduction of VTR, the technological environment for TD was digitized from location shooting to editing to broadcasting. This change began in the mid-1980s and is still continuing. Digitization basically deepened the aforementioned changes brought by the introduction of VTR.

The progress of digitization will be explained for (a) location shooting; (b) editing; (c) broadcasting.

(a) Digitization of location shooting

Digitization made location shooting easier. More camera crew who don't have specialist knowledge took part in location filming.

Small digital video cameras that were capable of shooting broadcast-quality images appeared in the late 1990s and adopted by TV program production companies in the 2000s.²⁶ These digital cameras were developed as high-end mass-market commercial models. They cost between 300,000 and 400,000 yen, much cheaper than professional models that cost several million yen. Operations were further automated. After mass-market models became widely available, production companies often didn't hire professional camera crew but had directors carry the camera.

The recording medium was mini DV tape until the mid-2000s. Since then, SD card became mainstream. Depending on the setting of image quality, an SD card can record images for several hours. On the other hand, the recording medium of professional-use cameras was videotape until the mid-2000s. It's still used, but will be gradually replaced with optical disks and others. It won't be long before videotape disappears from TV production. With high-definition quality, videotape can record up to 40 minutes, while an optical disk, depending on the quality setting, can record five to six hours. Prices of these media didn't rise as fast as the recording time grew. That means per-hour economic cost of obtaining documentary images has significantly fallen. Production staff was able to roll the camera for 100 times the length of their program if they wanted to.

²⁶ Early models include Sony's DCR-VX1000, launched in 1995, and DCR-VX2100 debuted in 2003. Digital cameras capable of shooting high-definition images started to hit the market in the second half of 2000s.

(b) Digitization of editing

In the field of editing, progress of digital technology helped make image processing more common and CG images more sophisticated. The DVE system, introduced in the mid-1980s, was slow in data processing and expensive. Since the mid-1990s, performances have improved while prices have fallen. It has become the standard feature at online editing studios in and outside of NHK.²⁷ Since the late 2000s, it has become possible to do basic DVE works with editing software that can be installed on ordinary personal computers.

In CG production, “NHK Special Human Body: the Universe Within” (1989) became talk of the town. Since then, CG production staff expanded their work with “NHK Special Einstein Roman” (1991) and “NHK Special Life: A 4-billion-year Journey” (1994-1995). “NHK Special Uchu: Michi eno Daikiko” (The Universe: Great Journey to the Unknown) (2001) was one of the first CG-featured programs shot with the high-definition quality for which the volume of data that need to be processed surged.

Since the late 2000s, it has become common for such programs as “NHK Special” and “Today’s Close-up” to use almost equal amount of CG as documentary images to handle linguistic or abstract topics like complex social issues and reviews of major incidents in the past.

“NHK Special Shindo 7 Nani ga Seishi wo Waketanoka” (NHK Special Seismic Intensity of 7: What Divided the Dead and the Survived) was broadcast on January 17, 2016 and won the Hosono Bunka Foundation Incentive Award. CG and other types of generated images accounted for 36% of the total broadcasting time (Miyata, 2018, p32). As for sound, narration accounted for 42% and voices obtained on location 11% (Chart 4-8). The balance between the two types of voices is similar to that of “Japan Unmasked” and other TD produced the pre-synchronized sound recording era. Since CG is created on computer, it doesn’t accompany sound obtained on location. It’s only natural that the percentage of location-based sound declines while that of narration increases.

(c) Digitization of broadcast transmission

Digital terrestrial broadcasting started in Japan’s three metropolitan areas – Tokyo, Osaka and Nagoya – in December 2003, and in the rest of the country by March 2012. Digitization of

²⁷ From the aforementioned interview with Mr. Fujino and Mr. Matsunaga.

transmission created unused space in the spectrum, enabling broadcasters to provide multichannel, high-definition broadcasts. TV programs became one of the numerous digital content.

In the era of analog broadcasting, the framework of TV broadcasting was solid. TD production staff didn't need to consider non-TV content as their rivals. In other words, TV was "all". But now TV is a "part" in the digital media. Production staff needs to compete not just with other TV programs but with various digital content other than TV.

4-2 Four periods of technological environment

The 66 years from 1953 to 2018 can be divided into four periods from the viewpoint of technological environment.

Focusing on the recording medium of documentary images, the period from 1953 to 1983 is "Film Period" and from 1984 to present is "VTR Period". In film Period, 16mm film was used to record and edit documentary images. In VTR Period, documentary images are recorded and edited on videotape.

The shift from film to VTR started in 1975, which is considered "Year Zero of ENG" at NHK, and gradually progressed.²⁸ Film and VTR coexisted between 1975 and 1983, but this article sets the start of VTR Period in 1984, by which time videotape had almost completely replaced film. In June that year, the filming department of the production operations division, which had been an organization of film camera crew involved in long TD production since the 1950s, was abolished and integrated into the production technology division that handled TV images as electrical signals.

Since the late 2000s, videotape has gradually been replaced by SD card, optical disk and other recording media. But TV production has yet become completely tapeless. The author thinks VTR Period is continuing as of 2018.

Both periods are divided into first and second half.

²⁸ The first VTR-based location filming (ENG reporting) at NHK is said to be [news coverage](#) of Emperor Showa's visit to the United States from September to October 1975. (NHK ed., 2001, Vol. 2, p47). An episode of NHK Special 1 "Hyosetsu no Haru Ohotsuku-kai Engan Hiko" (Spring of ice and snow: A flight along the Sea of Okhotsk coast), broadcast on April 15, 1976, was produced with VTR-based location filming. Of that year's 40 episodes of NHK Special 1, 9 were VTR-based and the rest were film-based. (Fujii, Suzuki, 1979, p12)

Film Period is divided into first half (1953-1971) and second half (1972-1983).

The second half starts in 1972 because of the deployment of camera equipment. Since that year, the filming division was equipped with many Eclair ACL, which was used as the standard film camera capable of synchronized sound recording (Eguchi, 1984). The years between 1967 and 1971 is when synchronized sound recording (double system) was widely adopted and the years from 1972 is when the system was established.²⁹

VTR Period is divided into first half (1984–2003) and second half (2004-). The year 2003, when digital terrestrial broadcasting began, is the end of the first half.

4-3 Outline of each period

In this section, the outline of each period is presented in accordance with the history of documentary programs shown in Chart 2. In addition to the findings acquired from the viewpoint of technological environment, production trends that are believed to have posed a significant impact on production methods are added.

***Film Period: First half (1952-1971)**

This is a period when TD, which had started as a “dialect” in television, obtained the synchronized sound recording technology (double system) to be able to freely use sound recorded on location.

NHK TD started as “television cinema” produced by people who had worked for news and culture films. Many researchers, including the author, sought the origin of NHK documentaries in recorded sound composition texts for radio broadcasts (Miyata, 2014 and others). But NHK documentaries are not originated from radio alone. Film should be regarded as the other source.

The first TD that became a regular program on NHK was “NHK Short Cinema” (1954-1959).³⁰ The program covered, like news and culture cinema, almost all categories

²⁹ An article by Kishu Iwai provides a look back at the history of simultaneous recording equipment from the viewpoint of a veteran NHK cameraman. (Iwai, 1973)

³⁰ Hisateru Furuta has researched “NHK Short Cinema”. According to Furuta, “there’s no denying that experiences and technique learned through the production of ‘NHK Short Cinema became the foundation of ‘Japan Unmasked’.” (Furuta, 2006, p249)

from politics, economy, science, society, individuals, travel and nature. “Japan Unmasked” (1957-1964), produced by people who had honed their recording and composition skills on society-themed radio programs, became a hit and established TD featuring social issues. Naoya Yoshida, Ichiro Ogura, Masaaki Segawa, Kiyoshige Onishi and Yoshikazu Ogino, who all had worked on radio and were involved in the production of “Japan Unmasked”, became leaders of NHK TD.

In the 1960s, around the time “Japan Unmasked” ended, 30-minute regular documentary programs started one after another. “Gendai no eizo” (Images of Today) (1964-1971), “A Life” (1964-1971), “Travels across Japan” (1963-1982), “NHK Tokuhain Hokoku” (Reports from NHK Correspondents) (1964-1978), “Asu wo Hiraku” (Opening Up Tomorrow) (1967-1971) all became staple TD covering society, individuals, travel, foreign affairs and science respectively.

Though with varying degrees, these TD began to adopt the double system for synchronized sound recording from around 1967. Standalone masterpieces such as “My Town, My County” (1967) and “Passenger List AR-29” (1968) helped facilitate the adoption of the system. At that time, main voices in NHK TD were changing from narration to voices of subjects obtained on location (see Chart 4). The double system also enabled production staff not to synchronize images and sound. Some of the NHK TD produced from the late 1960s and early 1970s used images and sound in multimodal ways to describe reality in multilayered and polysemous ways. They had distinctive appeals.

*Film Period: Second half (1972-1983)

The staple documentary programs developed in the 1960s all ended in March 1971 except “Reports from NHK Correspondents” and “Travels across Japan”. In February 1972, live broadcasts of the Asama-Sanso Incident had an unprecedented level of audience share. It shocked producers of programs that did not use outside broadcasting, be they drama, documentary or film news.³¹ In 1973, NHK underwent a major organizational overhaul. The

³¹ When police stormed into the lodge on February 28 to rescue the hostages held captive by the United Red Army, NHK provided live broadcasting from near the site for 10 hours, 20 minutes. The average audience share was 50.8%. The figure reached 89.7% (NHK and commercial broadcasters combined) at 6:26 p.m., shortly after police arrested the hostage-takers (NHK ed., 2008, p32). Naoya Yoshida recalled the incident as a drama director that he “envis the real thing. Just one set with no one in. But it keeps audience’ attention for five hours...” (Yoshida, 1973, p11). A film cameraman said, “this broadcast involves not a single foot of film,” acknowledging that live images have the “advantage of ‘simultaneity’ with which film cameras cannot compete” (NHK ed., 2010, p2151).

education, entertainment and news divisions that had existed since 1957 were dissolved and merged into the general broadcasting division. This organizational structure continued until 1977, and during that period, “NC9” (1974-1988) and “NHK Special 1” (1976-89) started.³²

Based on the synchronized sound recording technology, “NC9” used voices of interviewees and reports by journalists and innovated the way news programs are made. “NHK Special 1” started with the slogan to “bring something new”. As TD, it covered all categories from society, individuals, travel, science and nature. It gradually began to feature wide range of topics such as big-budget overseas travel series, politics, economy, reviews of modern and contemporary history and future projections. These categories, except overseas travel series, are linguistics and abstract topics that were considered unsuitable for television. But the synchronized sound recording technology overcame this obstacle.

The technology initially helped nurture technique that uses synchronized and non-synchronized sound in parallel to depict reality in multilayered and polysemous ways, as seen in “My Town, My County” and “Passenger List AR-29”. But TD since the mid-1970s have generally shown people’s faces on screen and used lip-synching. Investigative reporting technique, which uses voices that have high levels of evidentiality to describe complex realities became mainstream. Toshiki Kudo, who worked as the director for “My Town, My County”, launched “Ruporutaju Nippon” (Reportage Japan) (1978-1984). Each episode of this investigative reporting program featured a reporter and interviews with people’s faces on screen to untangle complicated social issues.

During this period, mainly in the 1970s, TD that put more focus on images than words such as “Travel around Japan” and overseas travel series in “NHK Special 1” had major presence. The Silk Road series in “NHK Special 1” (1980-1981) was a smash hit in the final years of film era.

*VTR Period: First half (1984-2003)

The shift from film to videotape as the recording medium drastically changed TD.

Obtaining documentary images became far easier from the film era, opening up new

³² An article contributed by Kiyoshi Fujii etc. to *Hoso Bunka* shows that “NHK Special 1” was the brainchild of a cross-organizations project (Fujii, Suzuki, 1979). Production staff of “NC9” contributed three-part articles to *Hoso Bunka* to explain that the program was developed by a “hybrid group” that could not be categorized with conventional organizations and job categories (NC9 Production group, 1977).

categories for TD. Full-scale nature TDs that began with “Watching” (1985-1989) and led to “Darwin’s Amazing Journey” (2006-) have become primetime fixtures since the mid-1980s. This is probably because adopting VTR made shooting easier and the longer recording time enables production staff to capture the crucial moments of living creatures more easily.

“Region Special” (1985-1989) allowed young staff of local bureaus to produce TD to be broadcast nationwide. When two satellite channels began broadcasting in 1989, members from production companies joined NHK TD production. The staff size has significantly increased.

It’s important to mention that the switch from film to videotape means that documentary images became electrical signals like images of other TV categories. Documentary images began to be used for TV programs in general, making up “VTR parts” in long news shows and variety shows.

From the viewpoint of news and variety shows, the switch meant that they can obtain documentary images quickly and in large quantity. In this technological environment, department-store style news and variety shows, which are studio-based live broadcasts that feature various outside broadcasting images and documentary images, became popular. Weekday evening news shows, like “News Station” (TV Asahi, 1985-2004), followed “NC9” (1974-1988). This was the analog broadcasting era, which changed documentary images from a “dialect” to “standard” and enabled those images to be used freely. It may have been the prime of television.

Among TD, live studio-based, mini department store-style programs such as “Morning Journal” (1984-1991) and “Today’s Close-up” (1993-) achieved success.

However, if documentary images are the essential ingredient of TD, the independence and originality of TD weakened during this period. Studio-based TD have lower ratios of documentary images. People in the studio watch VTR and comment on it, so documentary images became “materials” and were no longer able to make direct appeal to viewers. On top of studio images, DVE-processed images and CGs started to gradually take over documentary images.

As producers started to use videotape for location shooting, sound began to lose some of its

characteristics it had in the film era. The single system was adopted for sound recording. That means multimodal expressions of images and sound lost their technological foundation not only for linguistic and abstract topics -- the main field of investigative reporting TD – but also for concrete and imagery topics.

*VTR Period: Second Half (2004-)

During this period, TD are produced while television is becoming just one part of the numerous digital media. Mini department-store type TD, which cover a wide range of social issues, and specialty store-type TD, which mainly use documentary images to look at specific topics, exist in parallel. The former is represented by “NHK Special 2” and “Today’s Close-up”, which have existed from the first half of VTR Period. The latter include “Tanken Bakumon” (Bakumon’s Exploring) (2012-), “The Professionals” (2006-), “Lunch ON!” (2011, 2012-), “Document 72 Hours” (2006-2007, 2013-), “Tsurube’s Cheers to Family” (1997-), and “Buratamori” (Strolling with Tamori) (2009, 2010, 2011-2012, 2015-).

The latter is representative for the second half of VTR Period. As Chart 2 shows, it’s unprecedented that six regular TD programs ranging from society, individuals and travel are on the air at the same time. Because their content significantly differ, it’s often overlooked that “Bakumon”, “Tsurube”, “Buratamori” all adopt investigative reporting methods that were established in the late 1970s with such texts as “Buried Report”. In these texts, reporters show their faces on screen and visit locations to interview people one after another.

The progress of digital technology has made processed images, CG and other generated images more sophisticated and easier to obtain. In mini department-store style TD such as “NHK Special 2” and “Today’s Close-Up”, the ratio of CG and processed images sometimes almost equals to that of documentary images. As for sound, the ratio of voices recorded on location has fallen to make way for narration (Miyata, 2018, 32). On the other hand, specialty-store type TD are consisted mainly of documentary images and the use of CGs and other processed images is limited. “Document 72 Hours” features almost no CGs and other processed images. (Miyata, 2018, 32). As for sound, voices recorded on location are used more widely than narration as shown in Chart 4-7.

5. Coda

This article defined TD, presented a list of major NHK TD and described the mid- to long-term development of production methods from the viewpoint of technological

environment. It's a rough sketch from a limited point of view, but the author believes that it will serve as a foothold for future TD researches.

Findings presented in this article will enable researches to take a closer look at the development of production methods in each period as shown in 4-2. Also, it is possible to use the findings to review other categories such as news and variety as well as TV broadcasting as a whole. The author plans to focus on the former for the time being.

Lastly, the author wants to say what it means to research NHK TD production methods.

Documentaries are a tool to help us understand reality. TD are broadcast on electromagnetic waves to millions, or even tens of millions of, people all over the country. They have a significant impact on how people understand reality. Researching TD production methods is to find out characteristics of the tool that has been widely used to understand reality. In other words, to find out how this tool captures and reconstructs reality.

NHK has produced and broadcast a large number of TD for more than 60 years as a public broadcaster. Researching NHK TD production methods has potential to find out an important part of the way Japanese people have understood reality since the mid-20th century with its chronological changes.

Bibliography

- Aida, Yutaka, *Dokumentari Watashi no Genba Kiroku to Dentatsu no 40 Nenn* (Documentary My Workplace: 40 Years of Recording and Delivering), NHK Publishing, 2003
- “Aru Jinsei” seisaku sutafu (“A Life” production staff), ““Aru Jinsei’ ga Mezasu Mono” (What “A Life” Wants to Achieve), *Hoso Bunka*, September 1965, 37-39
- Blandford, Steve, Barry Keith Grant and Jim Hillier, *The Film Studies Dictionary*, London, 2001
- Eguchi, Tadashi, *Satsueibu 30 Nenn* (30 Years of Filming Department), 1984 (Not for sale)
- Fujii, Kiyoshi and Mikio Suzuki, ““NHK Tokushu’ Purojekuto Ron ‘Hiantei’ he no Toraiaru” (A Theory for “NHK Special” Project: A Try for “Astable”), *Hoso Bunka*, March 1979, 8-21
- Fujitake, Akira, Sachiko Okamoto and Sakae Ishikawa, “Hoso Gijutu Shakai Bunkashi Josetsu” (An Introduction to the Social and Cultural History of Broadcasting Technology), *Studies of Broadcasting* Vol.27 (1975), 5-57

Furuta, Hisateru, “Terebijon Hoso ni Okeru ‘Eiga’ no Hensen” (Changes of “Films” in TV Broadcasting), *the Seijo University Arts and Literature Quarterly* Vol.196 (2006), 266-213

Hardy, Forsyth ed., *Grierson on Documentary*, New York, Praeger Publishers, 1979

Ito, Tsuguyoshi, “Firumu Doji Rokuon no Genjo” (Current Situation of Film Synchronized Sound Recording), *The journal of the Institute of Television Engineers of Japan*, Vol.30 (8) (1976), 632-640, the Institute of Television Engineers of Japan

Iwai, Kishu, “Terefirumu Kamera no 20 Nenn” (20 years of Telefilm Cameras), *The Motion Picture & TV Engineering* Vol..251 (1973), 30-35, Motion Picture and Television Engineering Society of Japan

Kimura, Hidefumi, “Naze Hyuman Dokyumento Nanoka” (Why Human Documentary?), *Hoso Bunka*, June 1978 24-29

Miyata, Akira, “Jijitsu to Rinen no Niju Rasen: Genryu toshite no Rokuon Kosei” (Double Helix of Reality and Ideal: Recorded Sound Composition as the Headwaters), *the NHK Monthly Report on Broadcast Research*, December 2014, 22-69

Miyata, Akira, “Deta kara Yomitoku Terebi Dokyumentary Kenkyu” (TV Documentary Researches Analyzed with Data), *the NHK Monthly Report on Broadcast Research*, April 2018, 16-43

NC9 Seisakusha Gurupu (NC9 producers’ group) “Nyusu Senta Kuji no Genba Kara Daiikkai: NC9 wa Nani wo Kaeyo to Shitanoka” (From the production floor of NC9 Part 1: What NC9 tried to change), *Hoso Bunka*, July 1977, 38-43

NC9 Seisakusha Gurupu “Nyusu Senta Kuji no Genba Kara Dainikai: Dokyumento NC9” (From the production floor of NC9 Part 2: Documentary NC9), *Hoso Bunka*, August 1977, 38-43

NHK ed., *NHK Satsuei Dokuhon* (NHK Filming Handbook), NHK Publishing, 1980

NHK ed., *NHK Nenkan '85* (NHK Almanac 1985), 1985

NHK ed., *Nijusseiki Hososhi* (20th Century Broadcasting History), 2001

NHK ed., *NHK wa Nani wo Tsutaete Kitaka Shin Nihon Kiko: Hoso Bangumi Zenkiroku Ichiran + Bangumi Kokai Raiburari Risuto* (What NHK Has Broadcast Travels across Japan: All Records of Broadcast Programs and List of Archived Programs Available for Free), 2007

NHK ed., *NHK wa Nani wo Tsutaete Kitaka NHK Akaibusu Katarogu: Terebi Bangumi Hoso Kiroku + Bangumi Shoshi 1953-2008* (What Has NHK Broadcast NHK Archives Catalogue: Records of TV Program Broadcasts and Their Short History 1953-2008)

NHK ed., *NHK Hodo Kameraman no 50 Nenn* (50 Years of NHK News Cameramen), 2008 (Not for sale)

NHK Hodo no Kiroku Kanko Iinkai (NHK “Records of news reporting” publishing

committee), *NHK Hodo no 50 Nenn* (50 Years of NHK News Reporting), Kondo-Shoten, 1988

NHK Sogo Hoso Bunka Kenkyusho Bangumi Kenkyuhan (NHK general broadcasting culture research institute program research group), *Telebi Sogyoki no Hitotachi no Shogenshu 2* (Accounts by people who worked in the early period of TV broadcasting 2), preserved at NHK Broadcasting Research Institute, 1978

Niwa, Yoshiyuki, “Terebi Akaibu Kenkyu no Sido ni Atatte” (At the Start of TV Archive Research), *Studies of Broadcasting and Media* Vol.8, Maruzen Publishing, 2011

Omori, Junro, “War and Radio (Part 2) Link the Battle and Home Fronts: Listening to Wartime Transcribed Broadcasts (vol.1)”, *the NHK Monthly Report on Broadcast Research*, December 2017, 2-23

Sakurai, Hitoshi, *Terebi wa Senso wo Dou Egaite Kitaka Eizo to Kioku no Akaibusu* (How TV Has Described War: Archives of Images and Memory), Iwanami Shoten, Publishers, 2005

Sony Corp. Koho Senta ed., *GENRYU* (Headwaters), 1996

Yoshida, Naoya, “Dorama demo Dokyumentari demo nai X: S san he no Tegami” (X is Neither a Drama nor a Documentary: A Letter to S), *Hoso Bunka*, March 1973, 10-15