

Development of Environment and Disaster Mitigation Educational Programs, in Water Disasters in the Right Bank of the *Tama River* (*Takatsu Ward* and *Tama Ward, Kawasaki City, Kanagawa Prefecture*) Inundated by Typhoon "*Hagibis*"

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1 Introduction

Mukainooka Technical High School (*Tama Ward, Kawasaki City*) is on the border with *Takatsu Ward*. The school is located in the *Tama River* lowland (alluvium), just south of the right bank of the *Tama River*, in a flood inundation area. *Tama Hills* and *Shimosueyoshi Terraces* are located about 500m south from this school, along which many sediment-hazardous areas and steep slope collapse areas are distributed. In front of the hills and terraces is the nearest station "*Kuji*".

Around the school, the "*Kawasaki Loam Slope Failure Test Accident*" occurred in 1971 and the "*Tama River Flood*" occurred in 1974. By Typhoon "*Hagibis*" in 2019, part of the school and its surroundings were flooded, and about 1km from the school died east (*Takatsu Ward*). By implementing the "Environment and Disaster Mitigation Educational Programs, in Water Disasters" introduced in this presentation for the evening classes students of the school, worked on the development of "Community Educational Programs on Meteorological Disasters and Climate Change Adaptation" to elementary and junior high schools in *Kawasaki City*.

2 Fieldwork Practice (in 2017)

"*Field Works of Environment and Disaster Mitigation B*" is a School setting Subject, is an elective subject, a summer intensive subject. In 2017, we conducted the following classes on the theme of "Water Use and Environmental Disaster Prevention". Except for pre-learning, we performed during the day.

(1) July 18th; Pre-learning (The School)

Students learned about the heavy rain disaster and its mechanism, and the basic policy for adaptation to climate change and heavy rain of *Kawasaki City*.

(2) 20th and 21st; Fieldwork (*Takatsu Ward*)

Using "Takatsu Ward Watershed Topographic Map", "Disaster Prevention Map", "Flood Hazard Map" and "Landslide Hazard Map" issued by *Kawasaki City*, we visited past flooded places and places where sediment disaster may occur, and students considered the relationship between the origin of the topography, civil engineering work, and environmental disaster prevention of water.

(3) 22nd; *Port and Airport Research Institute* (*Yokosuka City*)

Students participated in the public opening of the institute, and learned and considered the latest science and technology related to Environment and Disaster Mitigation of water.

(4) 24th; *Honjo Life Safety Learning Center* (*Sumida Ward, Tokyo*)

Focusing primarily on water disasters, students learned about disaster preparedness through their

experiences and then walked through the zero meter above sea level to deepen their learning.

(5) 25th; Conclusion(The School)

All students summarized the results learned for 4 days. These were presented at the school festival.

In the Tamagawa River system, the more impressive Students, the more severe the damage caused by Typhoon "*Hagibis*". The dead came in the most impressive places.

3. DIG(Disaster Imagination Game) for all school students (in 2018)

All students (89 students) experienced DIG specializing in water disasters in a conference room for 90 minutes on September 25th. DIG was combined with "evacuation training" and "disaster home training". Each group of DIG consisted of 5 to 6 students from the same school and mixed grades.

First, students were informed about recent water disasters nationwide, past water disasters near high schools, and their mechanisms. We expanded the 1 / 10,000 topographic map, "*Mizonokuchi*", to 3km x 4km, including "*Mizonokuchi*" and "*Noborito*", which are transfer stations between the *JR Line* and private railways that pass near our school, to the A0 version. Each group wrote on it necessary information such as infrastructure and danger areas from each of the four maps used in 2 (2), and created a disaster prevention map.

From the disaster prevention map prepared, each group considered "the disaster's strengths and weaknesses around the high school assuming a flood," and "return routes when public transportation near the high school was suspended due to the possibility of flooding". A few students found a route to go to the bus street after evacuating to a wide-area evacuation area "*Midorigaoka Cemetery*" on a terrace without passing through sediment-hazardous areas and steep slope collapse areas. All the students shared those opinions of each group.

Keywords: Environment and Disaster Mitigation Educational Programs, Water Disasters,
Administration-School Cooperation, Fieldwork, Hazard Map, DIG (Disaster Imagination Game)

環境と防災のフィールドワーク～気候変動適応策を学ぼう～

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プログラムの概要

近年、スーパー台風の発生や局地的豪雨などといったこれまでに経験したことのないような異常気象による大規模災害が数多く発生しており、地域の防災対策の強化が重要な課題となっている。

そこで、自然災害から命を守るための行動や、地域や地球規模で起こる災害をどう自分たちは減らしているのかについて考えることが重要となる。

この授業では、地球温暖化を背景に身近に深刻な気象災害が起こり得ることを学び、地域の地理的環境と大雨による浸水被害の場所や災害対策事例についてまち歩きで実



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- ①高津区流域地形地図（たかつ凸凹マップ）を使って、まち歩きをしてみる
②まち歩きで使った関連地図 ③まちの地形を確認

際に見ながら、日頃からの災害への備えと、被害を抑止するための低炭素社会の実現の重要性を自ら考え、行動に移す力を身に付ける。今回は、県立向の岡工業高等学校定時制・総合学科の夏季集中講座「環境防災フィールドワークB」（2～4年生自由選択授業）の中で実践した。

プログラムの目標

①事前学習として、気候変動による影響や川崎市内の気温の変化、「緩和策」と「適応策」とその取組などを理解する。

②環境や防災資料を基にまち歩きで流域の境界や、過去の浸水被害の場所、河川の浸水対策場所などを巡り、気象災害から身を守るポイントなどを学ぶ。

プログラムの流れ

1 時限目

「大雨による災害から身を守るためには～大雨災害と気候変動～」の屋内授業（最近の異常気象、地球温暖化が進むとどうなるか？、川崎市の気候はどう変化しているか？、気候変動に適応するとは？）

フィールドワーク（4時間）

- ・平瀬川の治水対策
- ・河川流量の変遷
- ・土砂災害警戒区域の自然崖
- ・久地円筒分水の歴史
- ・多摩川かすみ堤の歴史
- ・河川の水位標の確認
- ・流域境界と標高の高低の関係等

フィールドワーク（6時間）

- ・多摩川・鶴見川の大流域境界
- ・谷戸を知る
- ・小流域の中の内水被害の場所
- ・矢上川と古墳等の関係
- ・多摩川崖線と谷戸
- ・湧水地と地域と生物多様性
- ・有馬川の浸水被害の場所等

今後の展開：今回の学習で開発したカリキュラムについて、今後、市内の小・中学校などに提供して気候変動適応策に関する学習の実施を支援するなど、地域における環境教育・学習の推進を図る予定。

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