

# Training course towards Sustainable Development Goals; challenges and opportunities learned from Kanazawa City

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## Abstract

We created the training course towards Sustainable Development Goals (SDGs) in Kanazawa City, and observed the challenges and opportunities of SDGs in the practice. Field destinations were divided into water, energy, agricultural, fishery, and forestry sectors. Fieldwork showed the strong interconnection between each sector and their sustainable cooperation was clearly observed. However, we have faced several challenges and questions while conducting the course. For example, not all SDGs were related and appropriate to the region, as well as inability to encompass all the SDGs in one course, and also whether the sustainable city model of Kanazawa City can be implemented in developing countries. To address these questions, in our future studies we are going to develop an integrated educational framework towards SDGs.

**Keywords:** Sustainable Development Goals, Education Models, Awareness raising, Fieldworks, Environmental Sectors

## I . Introduction

In 2015, The United Nations adopted the Sustainable Development Goals (SGDs) Agenda with 17 goals and 169 targets, which are aimed to end poverty, and promote prosperity and human well-being until the year 2030 (1). SDGs are considered to be the main tools to balance between biodiversity preservation and natural resource utilization for sustainable social, environmental and economic development. The concept of SGDs were widely accepted in countless international organizations, national institutions, enterprises and local communities. SGDs cover a very wide range of specific areas and it is expected that higher educational institutions will particularly make a positive contribution by implementing SDGs goals into teaching, research or community engagements.

To raise awareness about urban sustainable development, we have previously conducted fieldwork activities where we linked the biodiversity with the cultural diversity of Kanazawa

City and monitored about the importance of human capital for sustainable development (2). However, in our previous fieldwork, we didn't apply any socio-economic or environmental sectors of the city. In this study, we decided to create the training course towards SDGs for the international students, and evaluate the sustainability levels of the city's environmental and economic sectors, particularly in Water Energy and Food (WEF) sectors, which cover goals like Goal 6 - Clean water and sanitation, Goal 7 - Affordable and Clean Energy, Goal 11 - Sustainable Cities and Communities, Goal 12 - Responsible Consumption and Production, Goal 15 - Life on Land, and others. Besides, we decided to monitor how those sectors depend on each other and function in an integrated manner. WEF have been recognized as the priority areas for the SDGs, both in UN's Rio+20 outcome document as well as in the Open Working Group outcome document (3). The objectives of the course were to acquire integrative knowledge and skills through the fieldwork and directly address the SDGs at the municipal level.

Kanazawa City was chosen as the area for our fieldwork, due to the following factors; the city develops its economy while preserving its environment (ecology) and ecosystem services, thereby stabilizing its economy with traditional and modern culture; locals for many years cultivated the ability to maintain the lifestyle in harmony with traditional cityscape and crafts, and as a result in 2009 the city was designated as the UNESCO Creative City in the field of crafts. Moreover, Kanazawa City has been recognized for its endogenous economic development (4), where the city uses its own knowledge, capital, and industries. The modernization is generated from within the city with the strong traditional cultural identity of the local people. The city's economy avoids the large-scale industrial development and holds a group of sustainable medium and small-sized companies, with many cultural investments. As a result the city protects its traditional industries, cityscapes, and natural environment.

## II. Design of the fieldwork and practical applications

The intensive fieldwork was conducted during five days. Participants were six graduate students from United Nations University for the Advanced Study of Sustainability and three graduate students from Kanazawa University. International students had no information about the region, and at the beginning of the fieldwork, students were given basic lectures about the environmental and geological features of the region. In our field destinations, we tried to encompass as many sectors as possible related with SDGs, but we found out that not

all SDGs were applicable to the city. Field destinations were divided into the following sectors, as displayed in Table 1.

**Table 1. Visited Sectors with the main goals (in bold) and related goals.**

Visited Sectors		Main Goal (in bold) and related goals
Water	Water purification sectors, wastewater management and energy plants	<b>Goal 6 Clean water and sanitation</b> Goal 1 No poverty Goal 3 Good health and well-being Goal 7 Affordable and clean energy Goal 11 Sustainable cities and communities Goal 12 Responsible consumption and production
Energy	Renewable energy sectors, urban waste power plants, landfills, and recycling facilities	<b>Goal 7 Affordable and clean energy</b> Goal 3 Good health and well-being Goal 11 Sustainable cities and communities Goal 12 Responsible consumption and production
Agriculture	Sustainable organic agriculture fields, local food shops	<b>Goal 2 Zero hunger</b> Goal 1 No Poverty Goal 12 Responsible consumption and production
Fishery	City port and fishery sectors	<b>Goal 14 Life below Water</b> Goal 12 Responsible consumption and production Goal 13 Climate Change
Forestry	Local forestry	<b>Goal 15 Life on Land</b> Goal 12 Responsible consumption and production Goal 13 Climate Change
Education	Educational sectors of the city	<b>Goal 4 Quality Education</b> Goal 1 No poverty Goal 5 Gender Equality

All sectors provided us with a short lecture or movie presentation following the field observations. The total time for each field trip including Q&A was around two hours.

### III . Fieldworks'outcomes and further recommendations

The fieldwork showed the strong interconnection between each sector, and their sustainable cooperation was clearly observed. It was very difficult to address only one specific goal, without considering its relations to other issues. Each student chose a particular sector and gave feedback and further recommendations towards SDGs (5). Students also tried to make some recommendations for developing countries like Vietnam relying on the

studies learned from Kanazawa. Water and Energy Sectors were evaluated to be the most sustainable sectors of the City (Figure 1).

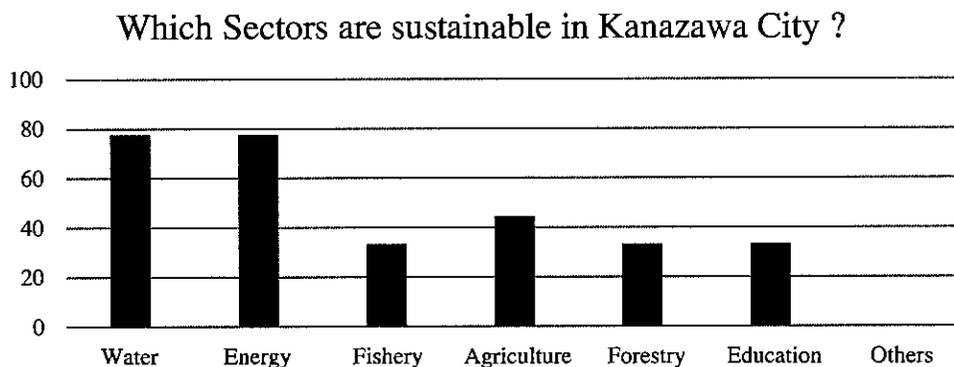


Figure 1. Sustainable sectors evaluated by the participants.

Students' feedbacks and recommendations for Water, Energy, Agriculture, Fishery, Forestry, and Education Sectors are described below.

#### **Water Sector, Goal 6- Clean water and sanitation**

Seven sustainable categories of water management in Kanazawa were presented:

1. Institutional arrangement and ownership: Water purification and sludge management facilities are partially self-budgeting and do not completely rely on the governmental support. Water management facilities are strongly interconnected with other facilities such as incineration plants and energy sectors of the city.
2. Effluent standards applied at the local level and not the national level.
3. Wastewater treatment plant technology functions where the cost and investment are low but the outcome is high.
4. House connection to waste water is 100%.
5. Septage management with anaerobic (microorganisms) digestion using sludge.
6. Source findings, financial commitment and cost recovery are high in Kanazawa.
7. Public awareness and education with the bottom-up approach towards changing behaviors.

Kanazawa's water management sector proved that an integrated approach is crucial for water resource management and the following recommendations were considered;

- National policies should be established while considering the integration between sectors Strategic planning must be adopted at the city level
- Develop appropriate financial policies for investments, and operation and management of the sectors
- Apply appropriate technology for treatment
- Develop effective institutional and regulatory arrangements at the local level
- Promote the capacity of local stakeholders
- Raise the awareness of sanitation services and water utilization

### Energy Sectors, Goal 7- Affordable and clean energy

Producing energy from waste is one way towards sustainability, and Kanazawa City's policy of incineration of solid waste manages the city's energy production in a sustainable manner. The city is trying to become an environmentally friendly city, and management is made considering the following factors;

1. Pollution control and incineration
2. Utilization of the waste heat in free public facilities, like pools
3. Automation
4. Providing training for environmental preservation
5. Engage businesses and the community in activities with a commitment to recycling resources

Incineration processes and outputs of Kanazawa;

- The facility burns mainly non-recyclable waste and is even “willing to buy electricity if the energy input exceeded the energy output of the facility”
- Sufficient funds for the establishment and maintenance of the incineration facility
- Generated energy contributes to the municipality's income
- The plant generates its own energy together with the renewable energy sources (solar power, hybrid lighting) and even provides excess power to the electric power companies
- The combustion emission gas level is strongly regulated by the strict environmental standards policies and its level is less than the combustion emission standard of Japan

Students discussed why the “Waste to Energy” model was sustainable in Kanazawa, and

they came to the conclusion, that the incineration towards sustainability model provided by Kanazawa does not function alone. The city has numerous sources of renewable energy: 5 Hydraulic Power Generating Plants, 84 Solar photovoltaic generators, 13 Hybrid plants, and 1 Biomass Generation Plant, which are functioning in interconnected ways. Next, is that the incineration facility is part of an integrated waste management approach which is based on waste hierarchy of 4Rs: Reduce, Reuse, Recycle, and energy Recovery and disposal. Therefore, even though the incineration can be very effective for the energy production, it is not the only waste management option of the city and the municipality does not heavily rely on it.

### *Agriculture, Goal - 12 Responsible consumption and production*

Kanazawa city is fostering sustainable agriculture not by promoting organic or natural farming, but mainly by producing local traditional vegetables, putting the cultural values ahead. 15 local vegetables were selected and branded as Kaga-vegetables for their production volume and economic demand, by the Kanazawa Municipality and branches of the Japan Agriculture Cooperative (6). These traditional vegetables were carefully selected over centuries, and they have natural seasonal rhythms for cultivation, and are stable to the disease and acclimated to the specific landscapes with the different soil, landforms and climate conditions. These deep ecological adjustments to the natural conditions of the land results in these vegetables being cultivated with fewer chemical inputs and thus contribute to the soil preservation. Kaga-vegetable production accounts for half of the city's vegetable production. Moreover, recently consumers want an assurance that the products they buy are safe and healthy, and they even want to know who produces it and how it was grown.

Cultural values are pivotal drivers in promoting the city's development, and besides emphasizing the production of the local traditional vegetables, the local stakeholders such as the Association for the Conservation of Kaga-Vegetables and the Municipality are promoting the Kaga Cuisine, with the menus inspired from feudal times.

### Further Recommendations

- Increase urban resident's interest in agriculture Promote green economy with sustainable consumption and production
- Promote urban regeneration with green agricultural spaces
- Increase local food preparation training

- Education and awareness-raising for the benefits of urban agriculture and food safety

### **Fishery, Goal 14 - Life below Water**

The Ishikawa Prefectural Fisheries Research Institute regulates the city's fishery, and is also the association that is responsible for the fishing marketing.

Students observed what makes marine and fishing sectors sustainable from the following features;

- Protected marine environment with strict waste mismanagement or littering regulations
- Banned fishing practices that put marine resources and species at the risk of depletion or exploitation
- Market controls to prevent illegal fishing and overexploitation
- Closed fishing seasons and breeding grounds
- Minimized clean water utilization to contribute to the development of waste management technologies
- “Designing, packaging, marketing and recycling” materials are considered with the purpose to reduce the environmental impact

Even though the fish catches have been stable for the recent years, there is the threat of the decline in the fishery production due to lifestyle changes and decrease in local demand. Fishery has the potential to contribute more to Japan's GDP and for further sustainable fishery practice some recommendations were suggested as well;

- Exporting more fish to other countries
- Secure sustainable small-scale fisheries with more employees
- Reduce the amount of unnecessary mortality of non-target marine species
- Consider the aquaculture

### **Forestry, Goal 15 - Life on Land**

In Japan, gradually the number of the people involved in forestry are decreasing because wood utilization is decreasing. However, in Kanazawa wood still remains as an important part of the local economy of the local economy and plays a multi-functional role for environmental preservation. During the forest field trip students noticed a good environmental habitat for the species. Non-timber industries are still abundant in the city

such as; charcoal production, mushroom (shiitake) production, rice production and vegetable farming, and traditional paper (washi) production in the mountain area of the city. The municipality provides subsidies for the local people for the forest management. However, problems with the population decrease, out-migration and lifestyle changes are strongly felt in the city.

Some recommendations were given for the future forest management in the City

- Empowerment of the local communities for the land use
- Skill transfer through training
- Promotion of non-timber products for outside markets
- Creatively revitalize the interest of wood and non-timber products in youth through art
- Empowerment of women for forest management and/or conservation
- Cultivating values of sustainability and maintaining forest ecosystems in Kanazawa  
Environmental education about forests and citizen-oriented activity
- Involve different stakeholders from different backgrounds
- Continue to promote biodiversity-friendly strategies of forest management

#### **Education, Goal 4 - Quality Education**

One of the strongest points observed for environmental conservation and sustainability in Kanazawa was the education. Each of the environmental sectors that we visited in Kanazawa provided videos for environmental promotion at the elementary level. Nature appreciation starts from the kindergarten level, and academic institutions together with the local government create local environmental activities through nature-based and hands-on experiences. Also, the city supports the activity as "Kanazawa school eco-project", which educates the children about limited resource control and utilization, natural values, energy saving, waste reduction, and many others. Besides, the municipality promotes special public education for waste reduction and recycling, and due to the local willingness in environmental preservation activities, the amount of the waste was reduced in the entire city. Citizens and private bodies are actively taking parts in the nature observation events organized by the city during all four seasons and monitor the local habitats around the city's ecosystem.

### *Spiritual practice and rejuvenating humanity, Goal 11 - Sustainable cities and communities*

Students have experienced that for the sustainability and achievement of SDGs, spiritual practice and creating values and morals are very important. They emphasized that the new era humans became the drivers for the environmental changes with many "anthropogenic" activities that created the accelerating socio-economic sectors, with many negative consequences. The traditional culture started to deteriorate with globalization and modernization. Kanazawa has preserved its traditional culture, which includes practicing Zen, gardening, crafts, and the tea ceremony, along with many others. The traditional culture of the city teaches about harmony, respect, purity, tranquility and is strongly connected with the appreciation of nature. Sustainable development should start at the personal and individual level. Looking at everything with more aesthetical and spiritual values can change our perceptions and help to bring sustainable practices into our daily lives.

## **IV. Challenges of the SDGs and future suggestions**

From the fieldwork, it was clearly observed how the integrative work of different urban sectors helps to achieve sustainable results in practice. We were able to observe the strong relationship of water with the energy sectors and how those facilities emphasize the importance of the collaboration between the local residences. Those sectors provide the devotional works and efforts to raise awareness of the environmental issues among local residents by creating many educational training programs. It was clearly observed that not only the integrity between the social, economic and environmental sectors is important, but personal and individual commitment to a sustainable lifestyle is essential in achieving the SDGs.

During the course we also faced some difficulties, as we found that not all SDGs can be appropriate for every region. Each region has its own characteristics, which do not always face the needs of SDGs. The other challenge that we faced was the difficulty to encompass all the SDGs in one course and also separate the goals due to their strong connection with each other. Moreover, after the fieldwork, several questions were raised such as; 1. Whether a sustainable city model similar to Kanazawa can be implemented in developing countries, and what will be the main obstacles achieving sustainability in those countries? 2. How can conservation and responsible utilization of natural resources be balanced in a sustainable

manner with the decreasing population?

To address those questions, in our future studies we are going to develop an integrated educational framework towards SDGs.

#### Notes

- 1) Kanazawa University, International Student Center

#### References

1. The Sustainable Development Agenda. Retrieved from <http://www.un.org/sustainabledevelopment/development-agenda/> (February 2017)
2. Aida, M., & Iida, Y. (2016). Development of educational fieldwork activities for the International Students: Case of awareness raising in biocultural diversity of Kanazawa City. *Research Bulletin, International Student Center Kanazawa University*, 19, 88-106.
3. Weitz, N., Nilsson, M., & Davis, M. (2014). A nexus approach to the post-2015 agenda: Formulating integrated water, energy, and food SDGs. *SAIS Review of International Affairs*, 34(2), 37-50.
4. Sasaki, M. (2003). Kanazawa: a creative and sustainable city. *Policy Science*, 10(2), 17-30.
5. Mammadova, A. (2016): "SUSTAINABLE DEVELOPMENT GOALS: Learning from Kanazawa City." 1-48.
6. Ministry of Agriculture, Forestry and Fisheries. Retrieved from <http://www.machimura.maff.go.jp/machi/contents/17/201/index.html> (in Japanese) February 2017

## 持続可能な開発目標を教育実践に導入； 金沢市から学んだチャレンジとチャンス

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### 要 旨

この研究では、金沢市で持続可能な開発目標（SDGs）に向けて集中コースを作成した。市の環境・社会経済分野を視察することにより、この目標の課題をフィールドワークで実地学習した。フィールドの目的地は、水、エネルギー、農業、林業、漁業、工芸と教育分野に分かれている。各分野は強い相対的な関連性を示し、持続可能な協力が明確になった。しかし、コースを作成する際、次のような課題と直面した；すべてのSDGsは地域に適切ではないこと、また各SDGsは相対的に関連し、個別な目標として考えられない。金沢市から学んだ持続可能な教育モデルは教育実習や途上国の教育モデルとして採用できるかなどを次の研究で調査する予定である。

キーワード：持続可能な開発目標，教育モデル，意識向上，フィールド実習，環境セクター