

The Construction of a Sound Material-Cycle Society at a Regional Level with Atsugi as a Model City

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Introduction

Japan's high economic growth period, which followed the conclusion of World War II, constructed a mass-wastage society, with a mass-production and mass-consumption style of living. The mass-wastage society made Japan's great economic leap possible; however, it is worried that the nation will eventually run out of both natural resources and room for waste materials if this type of society goes on. *The Basic Act for Establishing a Sound Material-Cycle Society* was approved in the year 2000 at the 147th ordinary session of the Diet. This started the Japanese Government to reconsider the mass-wastage society, and construct a society which will improve the level of the environment and also activate both the community and economy. Atsugi ISF will introduce the main actions to environmental problems taken in Japan, and will select those that could be possibly be done in the hands of us students, and present the creative solutions of the actions.

Japan's awareness on environmental problems

Japan is taking environmental actions based on the following five points:

- global warming
- the current situation of the world's environment, ozone layer, water system and soil
- the production of waste materials
- the risk of chemical materials in the natural environment
- biodiversity

From these points, we have chosen the production of waste materials, which is an issue that everybody needs to be concerned of, and have worked on the creative solution to it.

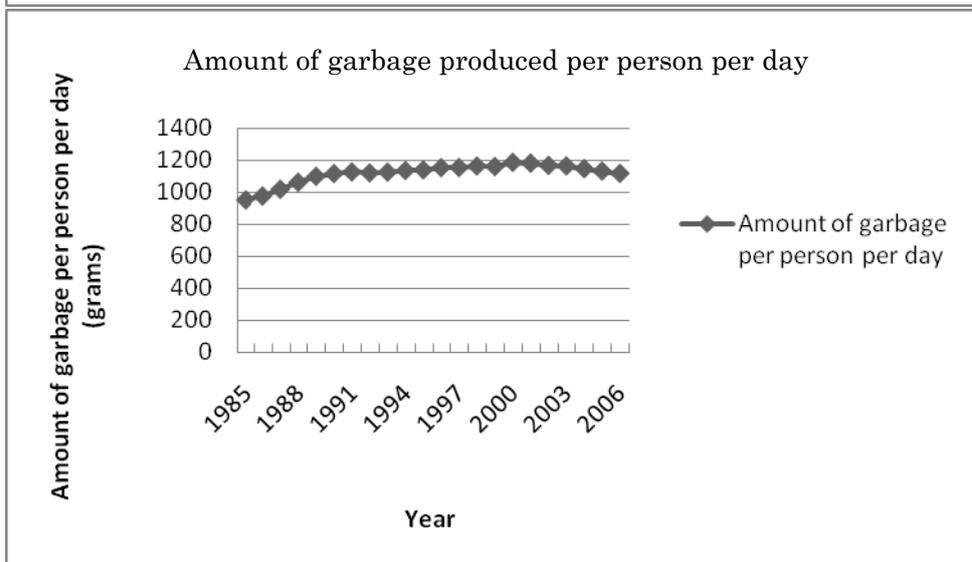
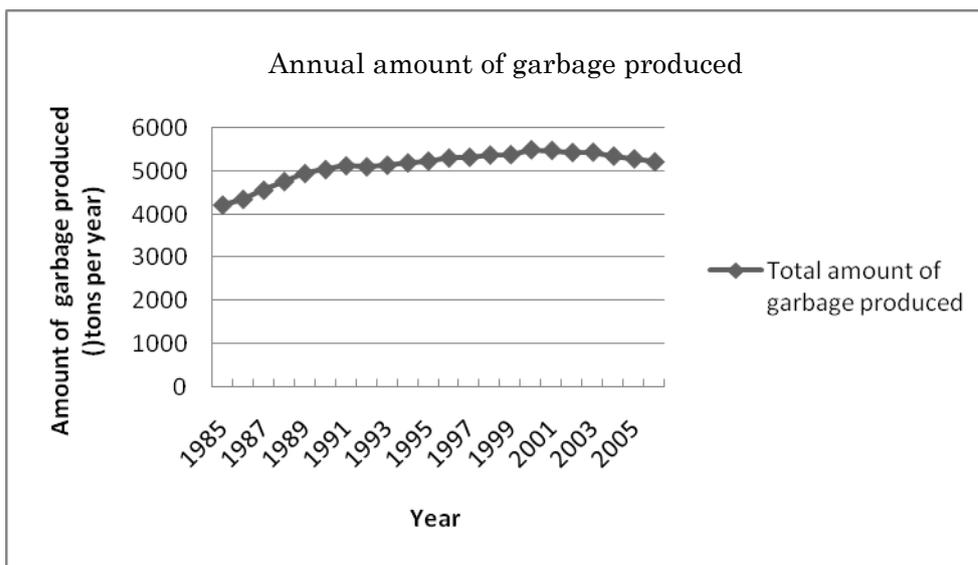
Japan's garbage matter and its solutions

When the course outputs of waste materials per citizen are compared, the number rises from years 1985 through to 2000; with a noteworthy rise between years 1985 and 1989, and later gently decreases from year 2001. *The Basic Act for Establishing a Sound Material-Cycle Society* was approved in the year 2000, and this year is therefore known by the name of *The First Sound Material-Cycle Society Year*. *Waste Disposal and Public Cleaning Law* and *Act for Resource Recycling of Electrical and Electronic Equipment and Vehicles* were re-considered after the *The Basic Act for Establishing a Sound Material-Cycle Society* came in act from year 2001.

The *Recycling Act*, which were limited to disposable containers in the past, were strengthened in the respective fields of household electronics, food, construction, and automobiles. The regulations by the law were strengthened hence, however, the

problem will not be solved unless local and public self-governing bodies, enterprises, and us citizens, start to work hand in hand to reduce the amount of waste produced. The charts below describe the following points:

1. Measures taken internationally
2. Measures taken within the Japanese government
3. Measures taken by local and public self-governing bodies
4. Measures taken by Atsugi ISF
5. What us students can do



An international measure ~the MOTTAINAI Campaign~

Wangari Muta Maathai, former Assistant Minister for Environment and Natural Resources of Kenya, who was honored with the Nobel Peace Prize in 2004 as the first African Woman for her contribution in environmental conservation activities and

improving rights for women, introduced the Japanese phrase *Mottainai* to the world. Maathai visited Japan in year 2005 to take part in an Kyoto-protocol-related event, and was deeply impressed by the phrase. *Mottainai* is used to describe a situation when items are not made use to the full and are wasted, and to warn those who attempt to do so. The *MOTTAINAI Campaign* is taking international actions to construct a Sound Material-Cycle Society by spreading the Japanese spirit of *Mottainai* to the world, and by spreading the lifestyle that reduces the burden on the environment.

Second-hand clothes and books, are collected and sold at charity bazaars around the world, and its proceeds, along with donations and proceeds from environmentally friendly items such as recyclable lunchboxes and chopsticks, are given to afforestation projects led by Maathai, including those greenbelt projects, that act against desertification. The campaign also promotes actions related to constructing a Sound Material-Cycle Society that are done in Japan, along with traditional Japanese lifestyles that reduce the burden on the environment. 70,962,087 yen has been donated, as of April 2009, since donations for afforestation projects started in March 2005.

Shibuya City in Tokyo, Japan, carries out creative solutions to environmental problems, such as *Shibuya Umbrella Campaign*, which was started in December 2007 by SOL (Symbol of Life), an organization lead by university and college students in Tokyo. A hundred and thirty million umbrellas are consumed annually in Japan; which ranks in first place in the world, and ninety percent of the umbrellas are disposed after used only once. *Shibuya Umbrella Campaign* collects dumped umbrellas, and lends them at cooperating stores, mainly cafes and bookstores. These actions of lending and borrowing umbrellas also has the effect of recovering the communication between citizens in major cities, which is now lost. MOTTAINAI Campaign has started to support this campaign since June 2009, and provides umbrellas that were collected charity bazaars. Celebrities in Japan also support this campaign by designing original umbrellas, and calling people to construct an environmentally friendly society.

A domestic measure by the Japanese government ~Biomass Nippon Strategy~

Biomass is defined as “a reusable, life-originating organic resource with the exception of fossil resources”, and has the concept of expressing the level of life resources. Biomass is a resource that can be continuously regenerated as long as life and solar energy exists. Biomass is mainly utilized in the following three ways: utilizing energy into fuel, utilizing material into fertilizers and food for domestic animals including fishes, and creating lignified plastic from the material. Biomass Nippon Strategy declares to promote biomass utilization for the following points; to prevent global warming, to construct a sound material-cycle society, to train a new strategic industry with competitiveness, and to activate rural areas that depend on agriculture, forestry, and fisheries as its income.

Local governments have been working, as part of the Biomass Nippon Strategy, since year 2004 to construct a *Biomass Town*. The plan promotes to utilize either more than ninety percent, on carbon conversion, of wasted biomass, or more than forty percent of unutilized biomass. Biomass is produced from life, and therefore has the characteristic of existing “in small numbers but widely”, which leads to the need of effective conversion of materials into energy at a local level. The role of a *Biomass Town* is to construct the system that makes these plans into real life.

A Biomass Town, with Miura City, Kanagawa, as an example

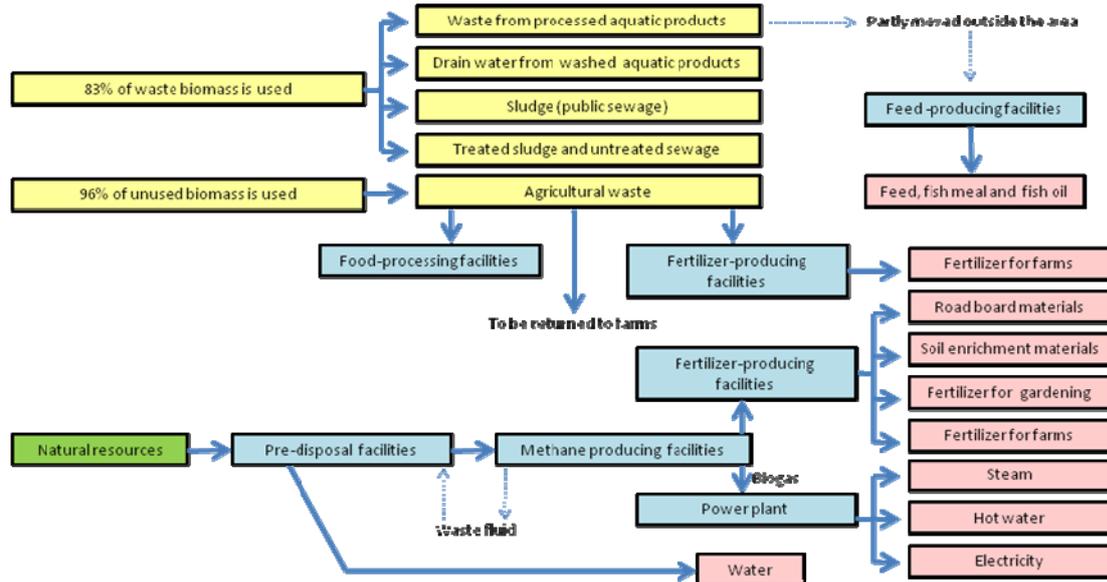


Chart 3: *Miura City's Biomass Town Plan*, edited by Atsushi Kimishima

A *Biomass Town* is a town where wise and practical use of biomass is performed stably, either now or in the near future. Persons and parties concerned must be gathered before the authorization of *Biomass Town* can take place. Persons and parties concerned, in this case, refer to administrations, local and public organizations, educational institutions, private enterprises, and citizens of the involved area. The second step is to investigate the amount of biomass in the area, collect information on advanced industries and technology, propose a *Biomass Town* plan that is unique to the area, and submit the plan to the district's agricultural administration and prefectural authorities.

The plan will then be examined by The Conference for the promotion of Biomass Nippon Strategy, and will be announced as a *Biomass Town* if the plan agrees with the standards. New environmental business models, such as financially-considered continual local system models that fit into local conditions, are hoped in the plans, along with creation of employment opportunities for the construction of new facilities for biomass utilization. Local areas, related governments, and municipalities around the nation will merit by sharing and exchanging information related to *Biomass Towns*. The government plans to recognize three hundred municipalities around the nation by year 2010. As of June 2009, Miura City is the only city in Kanagawa that is recognized by the Ministry of Agriculture, Forestry and Fisheries.

Miura City used to be a popular destination for tourists, mainly day-trippers, due to its local brand of tuna, known as *Misaki Maguro*. It was also famous as Japan's top tuna landing spot. The decrease in catch amount and price of marine resources, however, caused *Misaki Maguro* to drop from Japan's top tuna brand, which caused the depression in the fishing industry of the city.

In order to recover the brand of *Misaki Maguro* and to get back the status of Japan's top tuna landing spot, Miura City began to move towards equipping a

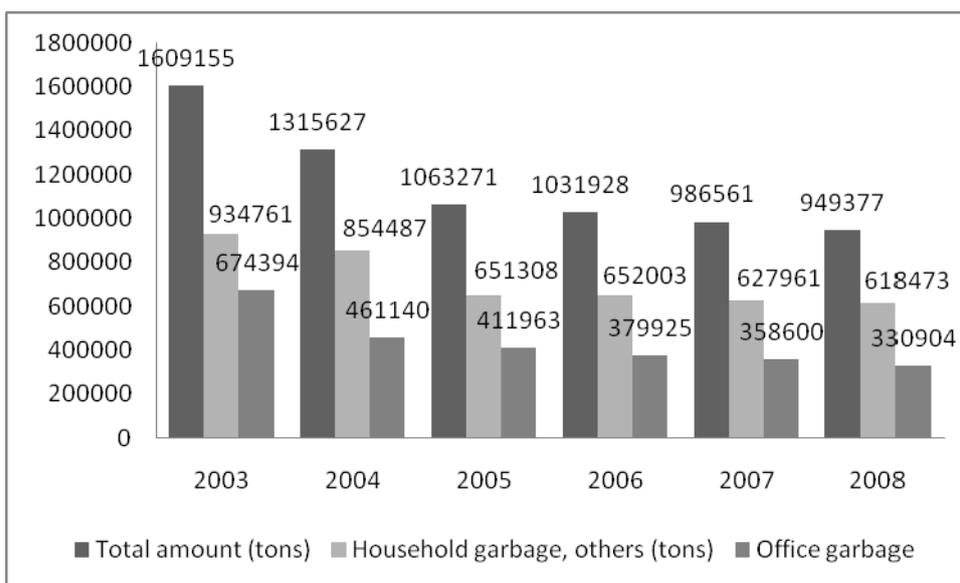
resource-recycling-type energy centre, using biomass technology, to create a *zero-emission* fishing port. *Zero-emission* refers to a system that ends up not producing waste materials during the process. This is made possible by applying waste materials and by-products that are created during the process of production into resources in other industries. In the case of Miura City, remains of tuna, which are waste materials from the fishing industry, along with leftover agricultural products, are converted into compost and fuel at the resource-recycling-type energy centre, leading to the abolishment of waste materials.

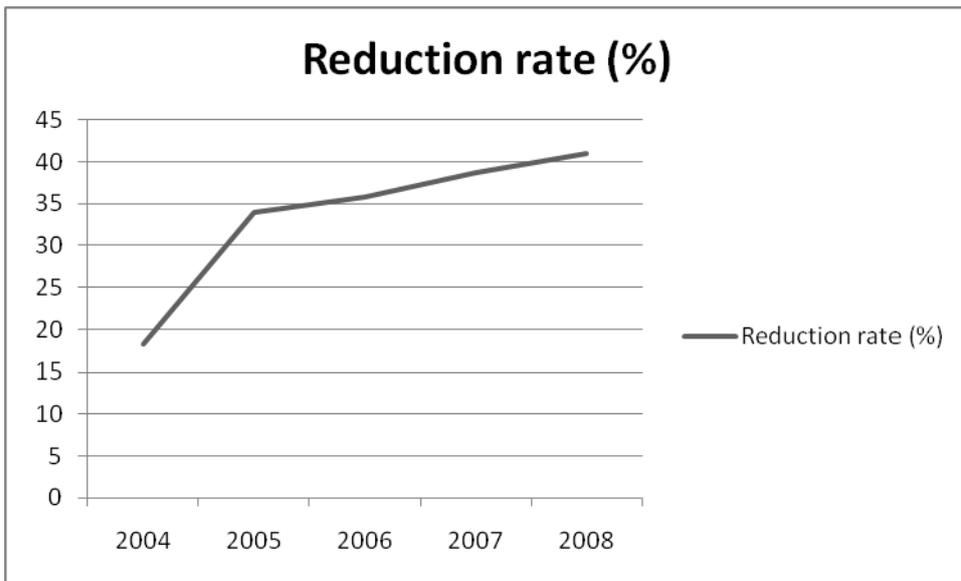
In reality, however, the transportation of leftover agricultural products collected around the city will produce carbon dioxide, which will be a burden for the environment. Also, the resource-recycling-type energy centre, which was planned to be built near the fishing port, was dispersed in the area due to unavailability of a large piece of land near the port.

A measure by Yokohama City~G30~

Chart 4 (Above): The annual changes in amount of garbage produced in Yokohama City, from Yokohama City’s website.

Chart 5 (Below): The effects of G3, from Yokohama City’s website.





Yokohama City in Kanagawa has a population of 3,651,428, as of year 2008, which ranks in second place in Japan, after Tokyo. Yokohama City had a high ratio of garbage per citizen until year 2001. If the amount of garbage kept on increasing at the same rate, the city had to construct new facilities to process the garbage. In order to reduce the cost of facilities, conserve the environment, create a comfortable urban environment, and to keep a rich natural environment, Yokohama City announced *Project G30* in 2002, which proposed to reduce the amount of garbage produced in 2010 by thirty percent, when compared to 2001.

As a result, the amount of garbage in 2005 was 33.9% less than that in 2001, which achieved the goal. The amount of garbage kept on reducing after this, and the amount of garbage in 2008 was 41.0% less than that in 2001.

A major characteristic of the Japanese system is that it introduced a system to encourage enterprises that does not follow the regulations. In order to spread the phrase of *Project G30* amongst the citizens, the administration organized booths at local events, and gave advice on how to properly sort garbage. Primary schools in the city are giving out side readers related to *Project G30*, which were created independently by schools, as part of environmental education. Original theme songs for the project, sung by famous Japanese artists, are played at garbage collection times, aiming to promote the project for the citizens.

The characteristic of this plan is that it does not have the need to construct a large-scale facility, which leads to making this project possible within a smaller budget, unlike Miura City, mentioned earlier.

A measure by Atsugi City ~Mission 35

Atsugi City, only 15% of garbage was converted into resources in year 2006, and the amount of garbage per person per day was 1108 grams. These numbers ranked in 18th place out of 19 cities in Kanagawa. In order to improve the rank, the city will be promoting a measure, known as *Mission 35*, from October 19, 2009. Districts of Morinosato, Tamagawa, and Nanasawa were selected as model districts, and *Mission 35*

has been going on since October 2008. As a result, the collection rate of resources almost doubled, with a rate of 187% compared to that of 2008. The percentage of garbage converted into resources was not mentioned.

The model districts of Atsugi City improved the system in the following ways:

1. The collection dates of combustible garbage were reduced, and the collection dates of resources were increased.
2. Plastics, which were sorted as *combustible* garbage, were changed into resources.
3. Combustible garbage and resources were collected at the same points.

A survey was taken in the model districts in order to find an explanation to the rise in collection rate of resources. The survey was conducted to 1200 citizens living in the area, aged over 20, and was selected randomly. The survey was conducted between the 6th and the 28th of February, 2009, and the collection rate was 46.1%. The results of the survey are as follows:

1. 77.6% answered that the increase of collection dates of resources made it easier to sort resources.
2. 83.4% answered that they dumped plastic every week, and 68.9% answered that the amount of combustible garbage decreased, since plastic was now sorted as resources.
3. 47.9% answered that the unification of garbage disposal points made it easier for them to dump resources, and 36.0% answered that the disposal points were already unified from the past.
4. 80.1% answered that they are looking for “the distribution of easy-to-understand leaflet”, following the start of *Mission 35*, in order to decrease the confusion that could come from the changes of garbage disposal points.
5. Atsugi City aims to decrease the amount of garbage by more than 30%, and to convert 35% or more garbage into resources in order to construct a sound material-cycle society. The citizens were asked to pick up to three actions that they thought were important for the city to take part from now on, and the results are shown in the chart below.

Action	Votes	Percentage
Promotion of a new system to reduce garbage and convert them into resources	274	49.5%
Addition of new items to convert into resources	81	14.6%
Promotion of the 3Rs	288	52.1%
Promotion to spread kitchen garbage processors	168	30.4%
Promotion of shopping at environmentally friendly stores	56	10.1%
Education in awareness to sort garbage and resources	329	59.5%
Public relations, including posters	121	21.9%

Others	30	5.4%
Unanswered	8	1.4%
Total	1355	244.9%

The results from this survey, along with examples from the succeeds in Yokohama City, mentioned earlier, resulted that public education in awareness to sort garbage and resources lead to the reduction in amount of garbage.

A second measure by Atsugi City ~Kitchen Recycle Project~

Atsugi City, in the past, was only taking measures for commercial activation. Since 2001, however, the reaction of customers became negative against measures for commercial activation. Atsugi City aimed for an urban husbandry that is compatible with both commercial activation and environmental conservation, launched ecological projects, and gained awards.

Year	Content	Award
2001	Installation of collectors for cans and bottles	
2003	Installation of solar and velocity-powered hybrid streetlamps	Kanagawa Environmental Award
2005	Launching of Kitchen Recycle Project	Ministry of Environment's public participation business

As a result, six hundred citizens brought kitchen garbage monthly, and 1.3 tons of kitchen garbage was collected. It was also promotes through the media, including television and newspaper, lead to the promotion of the shopping district, and numerous observation offers were made from around the nation.

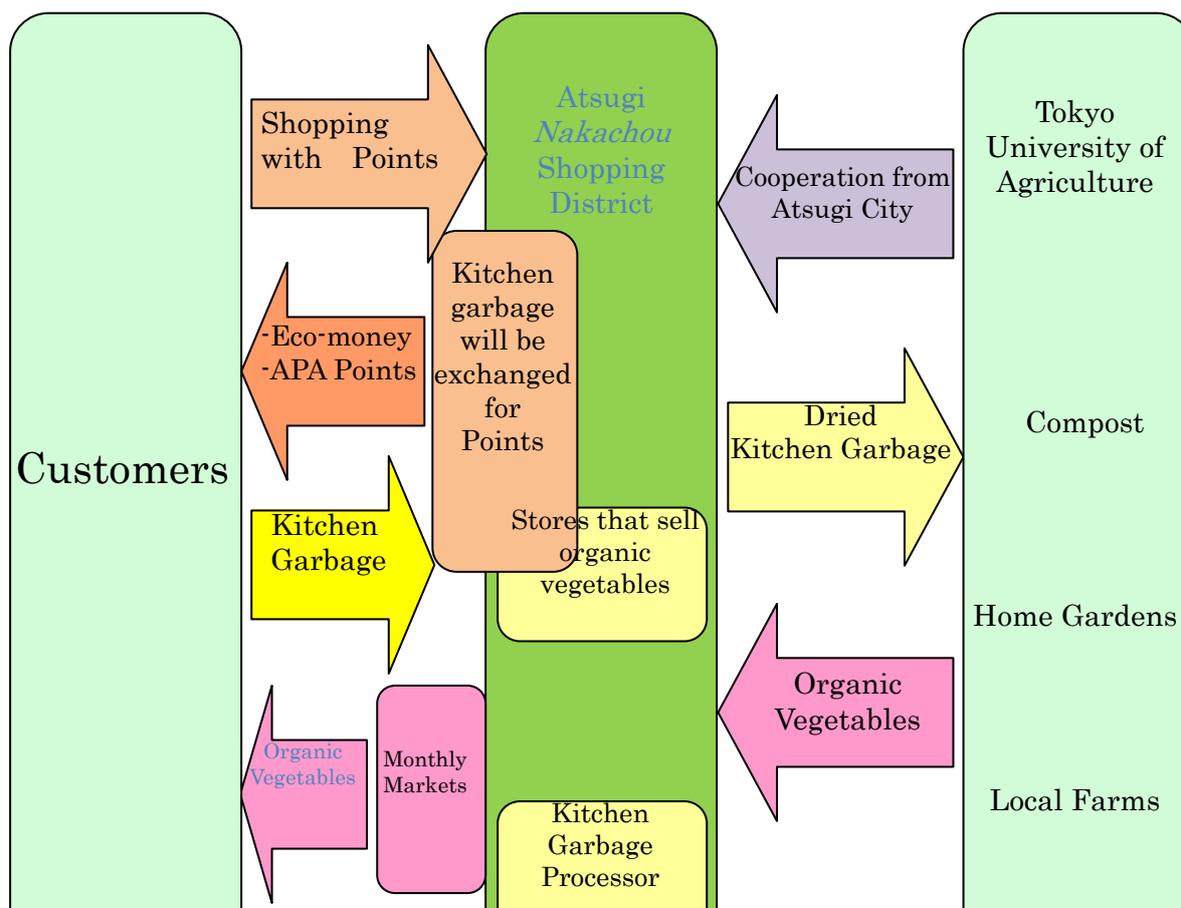


Chart 6: The contents of the Kitchen Recycle Project, from Atsugi *Nakachou* Shopping District's website.

Atsugi City planned and invested to the Kitchen Recycle Project. *Eco-stations*, which dehydrate and dry garbage, were installed by ATSUGI GARDEN CITY BUIL. Inc., and Tokyo University of Agriculture's Laboratory of Crop Production managed the project and produced compost from the provided garbage. The precise plan of the project is shown below.

1. When kitchen garbage is brought in by consumers, they will be given *eco-money*, which can be used at local shopping districts. The exchange rate is one yen for every hundred grams of garbage.
2. The collected garbage was then dehydrated and dried at *eco-stations*, and converted into compost at Tokyo University of Agriculture's Laboratory of Crop Production.
3. Compost, decomposed and fermented at a high level, created at the university will be provided to local farms, and its products will be sold at *Nakachou* Shopping District.
4. Consumers will be able to purchase the vegetables at *Nakachou* Shopping District using *eco-money*.

The Kitchen Recycle Project constructed a sound material-cycle model of farm products and *eco-money*. Students from Tokyo University of Agriculture also participated in this project, and took part in creating compost. The project, sadly, is not presently functioning, due to the odors from *eco-stations* and the damage to the facilities due to unpredicted alien substances in kitchen garbage. Tokyo University of Agriculture's Laboratory of Crop Production is thinking about installing *eco-stations* at local primary schools, but concrete measures are yet to be taken.

A measure by Atsugi ISF ~MYLORD Hon-Atsugi Rooftop Farm Project~

Considering the measures taken by local governments described above, we Atsugi ISF came to a conclusion that the solutions to environmental problems are effective at local levels. We believe that it is important to recognize the problem, and for local citizens, enterprises, universities, and administrations to work together for the solution. Continuous urban husbandry can be achieved by making "the solution to environmental problems" and "the activation of local economy" be compatible with each other. With these thoughts in consideration, *MYLORD Hon-Atsugi Rooftop Farm Project* was started in May 2009, in collaboration with Tokyo University of Agriculture, Atsugi City's Department of Commerce Prosperity, and MYLORD Hon-Atsugi Inc. , lead by Atsugi ISF.

The goals of this project are shown in the following four points:

1. To create a foundation for city offices, enterprises, and universities to work together in future projects to construct a sound material-cycle society.
2. To secure a sound material-cycle system for feces and urine produced from domestic

animals kept at Tokyo University of Agriculture, and to utilize Moso Bamboo (*Phyllostachys heterocycla*) that grow naturally at countryside landscapes within the Atsugi City.

3. To develop urban hospitality through “local production for local consumption”, by asking local restaurants to make use of the products.

4. To educate the next generation to take over the projects for local activation, by conducting food education programmes, mainly targeting primary school students, at the rooftop farm.

Fifteen garden planters were brought into the rooftop farm from Tokyo University of Agriculture. Various plants are being grown at the farm; brinjal, tomato, gumbo, beefsteak plant, celery, parsley, bitter gourd, and basil are just to name a few. Brinjal, tomato, gumbo, and various herbs are being harvested as of September 2009. Of these, brinjal and gumbo can be harvested almost daily. Vegetation that was originally planted at the rooftop were trimmed and improved, and a farm with more than fifteen species of plants is being developed. The farm has various species of plants, with only a few roots each species. Flowering plants, such as Japanese morning glory, globe amaranth, and sunflower, are being planted in addition to vegetables, and the flowers are blooming, as of September 2009.

Projects that are based on the rooftop farms are planned, at this moment, as follows:

- Flower beds, made out of moso bamboo, will be placed by October.
- A food education programme, including harvesting experience and a seminar for “local production for local consumption” will be conducted for primary school students in November.
- A wall surface gardening project will be managed next year.

Atsugi City is putting in an effort for the construction of a sound material-cycle society, due to the earlier mentioned *Mission 35*. Atsugi City’s Department of Commerce Prosperity is developing the *Atsugi Prosperity Adventure Project*, in cooperation with the five universities located in the city. This project aims to activate local economy using creative ideas from students.

Tokyo University of Agriculture, along with several members of Atsugi ISF, is participating in this project, and the university has a close relationship with the city. Odakyu Electric Railway Co. Ltd., the parent company of MYLORD Hon-Atsugi Inc. , declares that the enterprise will “contribute to the development of local societies and the enrichment of people’s lives through its business” as part of its corporate social responsibility. MYLORD Hon-Atsugi Inc. therefore positively cooperated with the project.

The roles of each organization are as follows:

- Tokyo University of Agriculture: management of the rooftop farm and planning of events
- Atsugi City: investment into projects, public relations within the city
- Odakyu Electric Railway Co. Ltd.: provide rooftop of *MYLORD Hon-Atsugi*,

cooperative management of projects with department stores, public relations outside the city

Conclusion

In order to solve the environmental problem, there is a necessity to prepare a structure where the entire local population can cooperate with each other. To do so, it is essential to prepare an environment where local citizens, enterprises, universities and the administration can have connections with each other. The garbage collection campaign, lead by Atsugi City's Department of Commerce Prosperity, can be given as an example of a project that connects the local population. It is taken place every Friday from 3P.M., and a lot of local citizens and workers participate in this half-hour-long campaign. This campaign will keep the town clean, and at the same time prevent crimes in the area. The interchange between participants will also lead to the increase of local power.

Students need to take a step forward into the society, and act in it in order to take measures for environmental problems. Students absorb information faster, and have a higher chance of suggesting innovative ideas. A volunteer's spirit and willingness to sacrifice one's private time to contribute to the society are needed in order to take actions in the society; however, students will be able to spend one's student life to the full by doing so. The construction of a sound material-cycle society at a regional level around the world will lead to the improvement of environmental problems at a world level.

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