New Tool for Improving Planning Capability of Local Government Staff

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Abstract

The key issue facing local Japanese government is improving the planning capability of local government staff; municipal governments in particular want to do more but lack the geo-political power. For example the city of Tatebayashi, as well as the towns of Itakura and Meiwa located in the Gunma prefecture are not well known to many Japanese people. Those areas are located in the Nikko city suburbs, a beautiful area known for the famous Toshogu shrine and Kinugawa ravine, in addition to popular hot springs. Developing the tourist industry may trigger further development of other industries and boost the economy in those cities and towns. These areas also have quality resources for promoting tourism including rare regional wild flowers, beautiful flower gardens, and Japanese festivals. Unfortunately, these areas have long been ignored and without any serious political representation mainly due to their geo-political location, which is outside the famous tourist sites. Under such conditions, improving the planning capability of those municipal governments is required to further develop the local economy using the present resources of the tourist industry.
Another key subject facing local governments are environmental issues such as solid waste management, which requires extensive preparation capabilities by staff, specifically efficient in arranging and executing plans. However, there are very few useful tools to assist in effectively formulating plans, projection of quantitative effects to acquire the necessary budget, or successfully incorporating the participation of local citizens.

Professor Makoto Ikeda and Mr. Kunio Nakamura developed a new Japanese ST tools, SimTaKN, for support planning which is intended to assist developing models more easily by conducting simulations without knowledge of many common rules used in ST/SD modeling. Using this new software in alliance with municipal governments, referred to as MIT, an abbreviation of the towns of Meiwa and Itakura, in addition to the city of Tatebayashi. Professor Makoto Ikeda conducted a series of two-days workshops of capacity development for the staff of the MIT alliance governments during the summer of 2003. Participants of this workshop created very clever plans including tourism industry development; such as solid waste management and protection of rare species with only minimal training using these newly developed tools. This software makes it possible to formulate plans for a municipal government with very little training while improving the planning capabilities, including qualitative and quantitative simulations with minimal effort. The quality of those studies were so successful that the municipal government of Tatebayashi city decide to actually carry out plans to find quantitative effects to be realized in 2004.

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In this paper, we hope to introduce how new SimTaKN software is useful for developing ST/SD model and how it could improve the planning capacity of Japanese local government staff using the case studies of MIT.

Key Words: capacity building, shareware, software, training

1. Background of this study and why strengthening the planning capability is necessary?
Japan's economic recession started in the 1990s and has continued for nearly a decade. During this recession, structure for economic development especially in rural area is completely changed. In 1970s and 80s, when the Japanese economy achieved high growth, agriculture, manufacturing and construction contribute to rural area development. Japanese manufacturing plants were constructed in rural areas during the 70s and 80s because of cheaper labor. This also contributed to the economic development of rural areas. However, during the 1990s, Japanese manufacturing companies shift their plants to overseas, mostly to Mainland China for reduced labor costs. Turning to the 21st century, the Japanese central government could not provide an affordable financial budget for infrastructure development in rural areas and changed the decentralization policy. This contributed to a rapid reduction in construction of infrastructure development in rural areas to as much as 60% or more.
The agriculture businesses are faced with poor performance as farmer's become older and the younger generation migrated to urban areas for work. Economic development in rural areas is necessary to maintain people's quality of life. And the planning staff of local governments must prepare for this difficult economic situation.

In this changing environment, local governments must modify their strategy and plans of rapid development using investors and financial assistant of outsiders (such as manufacturing companies and the central government) to modest and sustainable development using resources within the regions. If the jurisdiction of the municipal government has rich resources, such as a famous tourism spots, or close to a big city, planning staff of the municipal government can easily compose a quality development plan.

We will introduce how the virtual planning staff of three municipal governments in the city of Tatebayashi and the two towns of Meiwa and Itakura, located in the Gumna prefecture did in a case study named MIT. These two towns and city are far from Tokyo, the capital city of Japan, and also far from the capital city of Gunma Prefecture. In addition, these areas are a suburb of the famous tourism spot of Nikko and Kinugawa. Even though these two towns and city have attractive tourism resources, most tourists only pass these areas on the way to famous sightseeing spots such as Nikko Toshogu, or the hot spas of Kinugawa. The governmental body of the Gunma prefecture does not help with tourism promotions and campaigns, they focus on more popular tourist spots in the prefecture. The two towns and city that we refer to must make an effective economic development plan by concentrating on their areas resources.

In early 2003, MIT (Meiwa Town, Itakura Town and Tatebayashi City) created joint planning groups to develop and collaborate plans for the three municipalities. Professor Makoto Ikeda was asked by this group to conduct training for capacity strengthening and introduce SimTaKN, a newly developed SD: System Dynamics modeling software for improving their planning capability.
For the duration of June to August 2003, members of the virtual planning group were carefully selected for covering all functionalities of municipal government.
During September 2003, two days training on how to use SimTaKN, how to formulate socio-economic development plan using the SD model, and confirming the performance with simulation by Professor Ikeda was conducted; following the training and with the help of Internet support, three planning groups constructed excellent plans.

On November 14th, 2003, planning groups put together a presentation at the Symposium for Revitalization of the Local Society at Toyo University and held discussions with attendants about

their SD model and simulations. Their plans were well received; one of those plans was selected and implementing in Tatebayashi City during the fiscal year of 2004. Now, this plan is actually being measured and monitored under real circumstances.

After training and completing models, trainees understand different perspectives are necessary for success. Before attending this training program, many thought to influence traditional socio-economic development using force from outside sources such as cash from tourist or financial assistance by the central government. However, after concentrating on sustainable and participatory development planning, they clearly understood that the real engine of development is in the wisdom and willingness of local people (participants), planning staff support, and maintaining human resource networks. This helps to incorporate the ideas and activities of participants, leading to an ideal situation for achieve the goals and objectives of the plan.

Before explaining the plans in detail, we will briefly review a process of local socio-economic development. Toru Suetake, one of the authors of this paper submitted "Government Reform in Japan – An Application of SD National Model Based on SNA" to ISDC1999, New Zealand. In this paper, the author insists the capability and performance of planning staff in local government is a key issue for sustaining and further development of local economies. He has contributed to socio-economic development of developing countries, conducts technical transfer and advises on how best to strengthen the planning capability of government institutes. He mainly uses Vensim PLE and also encourages staff to use this software. Unfortunately, after the planning staff has mastered the SD modeling techniques, allowable features are limited with this free version, which also lack the necessary support features and concept of those existing SD modeling tools. Professor Makoto Ikeda has experienced similar issues when training several municipal government staff members. We know the SD modeling tools help to improve the capacity and performance of planning for local governments; however, we have experienced problems with existing SD modeling tools. They have poor Japanese language support, high cost and do not have a useful archive of Japanese language based sample models. English is not the first language of Japanese users, so manipulating the modeling tools was a difficult task without the use of an English dictionary. To address this situation, Makoto Ikeda and Kunio Nakamura developed new SD modeling tools to support in the designing of local socio-economic development plans, improving the language barrier for Japanese users. In the following paragraphs we will explain in greater detail how the planning staff of local governments can achieve a quality plan by using this new SD modeling tool, SimTaKN.

2. Process of socio-economic development

The areas of socio-economic development, especially for the planning staff of municipal governments, are usually in poor condition. Socio-economic development tools and methodologies such as PRA: Participatory Rural Appraisal or APA: Appreciative Planning and Action prove to be very useful and were developed on the experiences of assisting in the development of countries. For example, APA, one of socio-economic development methodology suggests to do as following spiral steps known as 4D model and planning covered mainly by Step 1 to Step 3.

1) Discovery: find useable resources in the area. Normally start to inquiry about their favorite place, culture, tradition and/or things their proud of. Thorough such inquiry, find useable resources candidates.
2) Dream: create birds-eye view of ideal future status and share this vision among participatory members. Normally, start to talk about the dream, desire or vision of individuals and community and share that dream or vision among participants. And then shape those to the shared vision
3) Design: create plan for achieving the vision with participation of people in the target area. Sometimes it may be necessary to do feasibility study or assessment study preceding the implantation stage. Normally, start to ask about idea of key success factors and how to realize the vision. Integrate many idea and suggestion to implementation plan.

4) Delivery: implementing plans with collaboration and contribution of stakeholders as first step in pilot project. Then review and evaluate the results and impact of pilot project. Lastly, extending the implementation.

In this process, the following methods are key issues for success:
a) Modeling: develop a simple but clear model of development to explain and get consensus among participants.
b) Visioning: improve or present the impact and results, sometimes outcome comes from the implementation of the project plan.
c) Human resources networking: develop the human resources network, especially collaboration of experts network to improve on the plan as well as extending information and expanding participation.

In this process, planning staff of municipal governments must carry out Steps 1, 2, and 3. However, Step 4 may be left to participants while planning staff works as backup or in a support role. Planning staff design and construct the system to smoothly carry out plans automatically. In this term, two kinds of capabilities are mainly required for planning staff. First, capability is prospecting as birds-eye view, or capable of gripping outline and explaining the big picture to participants. The second one is to carry on the plan strategically on a long-term basis. SD modeling is quite useful for both purposes. It presents a birds-eye prospective and strategy, and could explain outputs, impacts, effects and necessary activities for carry on the plan clearly to participants.

3. New Japanese modeling tool SimTaKN
Existing modeling tools such as Powersim and Vensim are excellent products and we do not intend to identify negative characteristics of those tools, but rather point out the importance and need of Japanese language friendly planning tools.
Some models insist that they have Japanese language support, although this is not necessarily true. Screen menus and manuals are written in English, leaving many Japanese users who are not fluent enough in English without support; especially locally hired planning staff of municipal governments.

An additional problem that exists is the high cost of the software. The price of Powersim and Vensim is around six thousand dollars, which proves to be quite a difficult expense for a local governments very limited budget. Some modeling tools provide a free trial period but users occasionally experience problems during installation. Again, please remember that the instructions are written in English only.

The final issue we would like to mention concerns ST: System Thinking modeling, which is more important than the rigorous SD modeling for planning staff in the early stages of their planning activities. Existing modeling tools focus on SD modeling with a rigorous approach. However, the planning staff has limited quantitative information during the initial stages and do not necessarily need a precise picture or simulation results. They tend to need a quick draw of the picture to find the impact and brief outcome of the plan. Rigorous and exact quantitative data is not essential to get to the pilot project stage or feasible study stage. During the early stages of planning, the need for flexible visualizing modeling tools to incorporate many ideas proves to be essential.

Kunio Nakamura developed the new SD modeling tools, SimTaKN, abbreviate from "**Sim**ulation **T**ool **a**nd **K**nowledge **N**etwork" which stands for " **S**ystem Th**i**nking Dynamic **m**odeling **T**ool and **K**nowledge **N**etwork". Professor Makoto Ikeda (referred to as Sensei in Japan) advises and is also involved in the development. Names of this product incorporate his initial, initial of his wife (Mrs. Takako Ikeda) and initial of Mr. Kunio Nakamura. In addition, the sound of this products name is very familiar for Japanese as a nuance of "my little boy Simta", and last syllable "-ta" is also a popular abbreviated name of first boy, "taro". This product is like their first child for Mr. And Mr. Makoto Ikeda as well as Mr. Nakamura.

This new product has interesting characteristics.
1) ST based modeling features: these modeling tools are placed between ST modeling tools and SD modeling tools because of limited functions for SD modeling tools. SimTaKN has layer structure of the sheet and can show either a brief or detailed model. Relation of elements can be determined as both equation and graph, but it is also possible to describe the relation with free draw graph. Kim Warren used this technique for business strategy development in "Competitive Strategy Dynamics". He makes a strategy model showing only determined relation with graph behaviors. In the early stage of planning, it is necessary to create a model with simple behavior graph relation, because of the lack of quantitative data and time for collecting the data. This helps to quickly incorporate ideas that are brought to the attention during brainstorming sessions. In such a situation quick determination is necessary for successful use.
   Though SimTaKN supports ST modeling and makes simulation possible with determination of elements with graph relation; for users who wish to make SD modeling with a rigorous approach, this software also supports that with determination of elements relation with equations.
2) Dynamics play mode: reviewing simulation results with graphical output is very important; this type of visualization helps participants to understand. Of course SimTaKn has such graphic outputs feature. However, the problem is that it is complicated and difficult to see all elements at once on the results graph. In addition, existing model do not allow you to see the model structure and simulation results at the same time. Dynamics play mode allows you to see how elements of the model could affect the simulation on the model structure. If elements of the model are affected rapidly, size of the elements change rapidly and user can easily find most effective elements directly on the model structure.

Moreover, the price of the products is quite attractive. SimTaKN is provided as shareware and priced just around 30 US$ after a free trial period. Existing SD modeling tools provide academic pricing, yet it is not adopted for governmental staff members. They have no choice but to pay full price which is quite expensive; more than two months salaries for locally hired planning staff of the local government.

SimTaKN supports the Japanese language with a users manual, on-screen menus and through the use of Japanese characters on the model; in addition, SimTaKN has a model database and Internet based forums to support model builders. The model database archives many models and interesting discussions, from socio-economic development model of various area in Japan to mental model such as Shakespeare's Hamlet. It is very useful when planning staff need a variety of ideas for modeling or solution and users may find these helpful. Professor Ikeda manages this archive on his home page; access to this archive is possible through the Internet.
The Internet forum is also a very attractive support feature of SimTaKN. On this forum users can get advise from experts and find solutions on the discussion log forum. Even student of Professor Ikeda participate on this forum and discuss their modeling homework. Of course, the municipal government planning staff joins this forum to discuss and exchange their experience on planning of socio-economic development of their local government. Through the use of this forum some users have made virtual planning staff groups and create joint events on the network, such as exchanging tours of their local festivals and joint product development by combining attractive but not well-known local products.

The Local and Global Department, Toyo University and Professor Makoto Ikeda support socio-economic development in rural area in many ways, including Internet support of modeling archives and SimTaKN forums. He and his colleagues also provide useful information for planning staff of municipal governments through seminars, training and summer schools. Professor Ikeda organizes a highly praised socio-economic development study course that incorporates the use of actually field research and discussions with local participants; local governments have already adopted the results of some studies.

4. Models developed by planning staff of local governments

During this session, we hope to introduce some of the models developed by virtual planning staff groups of Japan's MIT governments. At present, three municipal governments, Meiwa Town, Itakura Town and Tatebayashi City are independent government bodies. They are all located by each other in the suburb area of Gunma Prefecture.

Gunma Prefecture has very attractive tourist spots including Ikaho spa and Kusatsu spa that are seldom picked-up by the Tourism Association of Gunma Prefecture for their campaigns. MIT has tourism resources such as iris gardens, azalea gardens, autumn festivals, and firework festivals during the summer months, as well as cherry blossoms and sporting events. Those resources are known to local people but not well known by others. Furthermore, these three areas are located outside the center of Gunma Prefecture and Tokyo. People pay little attention to these quiet rural, agricultural, less commercialized areas, and end up passing through on their way to other destinations. With the on-going economic recession and change of the socio-economic structure in the 1990s, these areas have suffered a decline in local economic development.

In 2003, the three municipal governments created a virtual planning staff group and asked Professor Ikeda to conducting training for capacity building. Professor Ikeda made several planning groups with joint members of planning staffs and provided development themes of economic development, tourism industry development and addressed environmental issues.
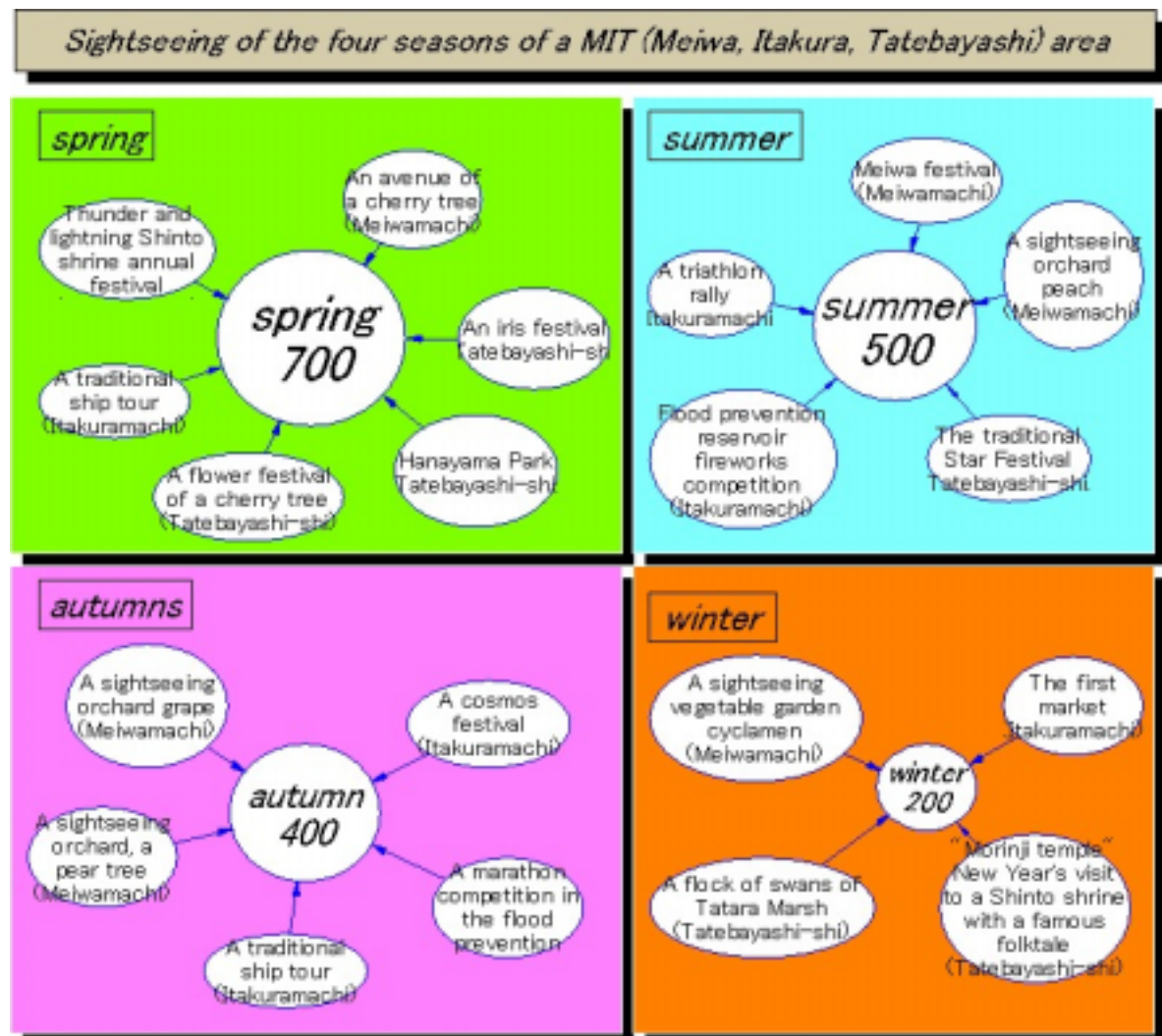

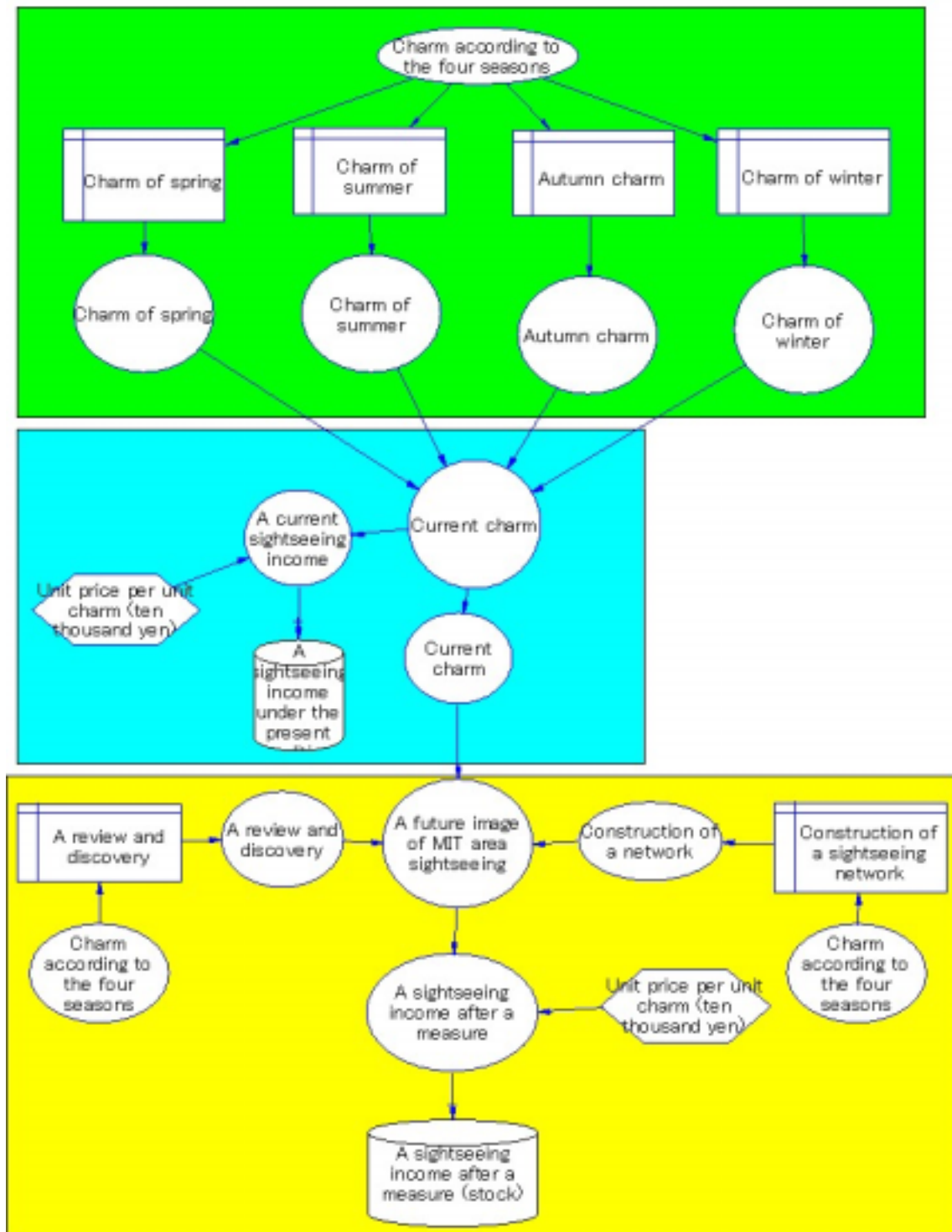Figure 4.1.1: Local resources of the MIT area in four seasons

Figure 4.1.2: Tourism Industry Development Plan

4.1 Model for tourism development plan
MIT areas key development plan is the tourism industry, as these areas are not very industrialized, making them pristine vacation locations. Tourism brings hard money to the local economy, which also improves opportunities to build good human resources between local people and people living

in urban areas. Enthusiasts of MIT prefer to purchase local products including agricultural-products from the MIT areas.

(1) Discovery
The planning groups first step is to list resources that may be use for tourism industry development in the area all through the four seasons. During the springtime, flower enthusiasts can enjoy the Cherry Blossom Festival of Tatebayashi City in April and can return again in May for the Sweet Flag Blossom Festival. In the autumn season, there is the Cosmos Flower Festival, and in the winter the Cyclamen in the Tourist Garden of Meiwa Town. Local festival lovers who enjoy the Meiwa Festival in early summer may return to the Tanabata Festival of Tatebayashi City and Firework Festival in Itakura Town. In autumn, the harvest of grapes and pears at the open garden is fun especially for family living in urban areas. They can take pleasure in the fresh air and fresh fruits while enjoying a day with their family and friends. The First Market Festival in January is also very attractive and tourist can find rare but interesting local products and traditional items difficult to buy in urban markets. (Figure 4.1.1)

(2) Dream
The attractive spots and events mentioned are not known to outsiders, who may only be aware of artificially constructed areas such as Tokyo Disney Land or Nagasaki Huis-ten-bosch. However, in the MIT locations tourist could enjoy traditional Japanese culture, attractive seasonal landscape with traditional life styles, and join in local festivals and local events throughout the year. (Figure 4.1.2 and Figure 4.1.3)

(3) Design
After completing the first steps mentioned above, the planning staff group creates plans to link these festivals and events and develop tour programs to the local festivals and event areas. By using bus transportation between the city and MIT, tourist could easily visit and enjoy these festivals and events. (Figure 4.1.4)

Figure 4.1.1 shows a list of local resources useable for tourism industry development. And the planning staff group creates the links to these resources for tourism industry development show in figure 4.1.2. Figure 4.1.3 shows the link to local economic development with tourism industry development. Using the industry development model to expand to the economic development model, planning staff can develop and incorporate a total plan of local area economic development.

Looking at Model 4.1.2 shows that by integrating attractive tourism resources with future visions of tourism industry, human networks, and by re-evaluation new findings can lead to a more attractive tourism industry development plan in detail while increasing revenue.
Unfortunately, this model is in the training stages and the SD diagram does not have a feedback loop, but during discussions at the symposium presentation, trainees understood there were feedback loops between top green box (tourism attractive resources of four seasons) and bottom yellow box (re-evaluation and finding new attractive tourism resources, stock of income from tourists as financial assistance for activities to maintain attractive tourism resources).

(4) Delivery
Shown in model 4.1.3, development of the tourism industry gives impact to the mind and interest of local people and they will actively get involved in maintaining attractive tourism resources or socio-economic development plan of the local government. For example, by increasing the summer festival attendance by local people a festival becomes more attractive and may also help to increase the attendance of outsiders. Another example would be to increase the maintenance activities of flower gardens to help enhance the attractiveness, which in turn will increase more visitors. Local residents can make requests to their local governments for increased budgets to maintain newly found tourism and may even suggest more effective and efficient ways to maintain resources. Bus tour plan, as one of detail plans for realized the Tourism Industry Plan, aims to increase visitors to MIT tourism spots shown in 4.1.4. In this detail plan, rigorousness is increased and character of model shift to SD model for estimate necessary cost and expected revenue with simulation.
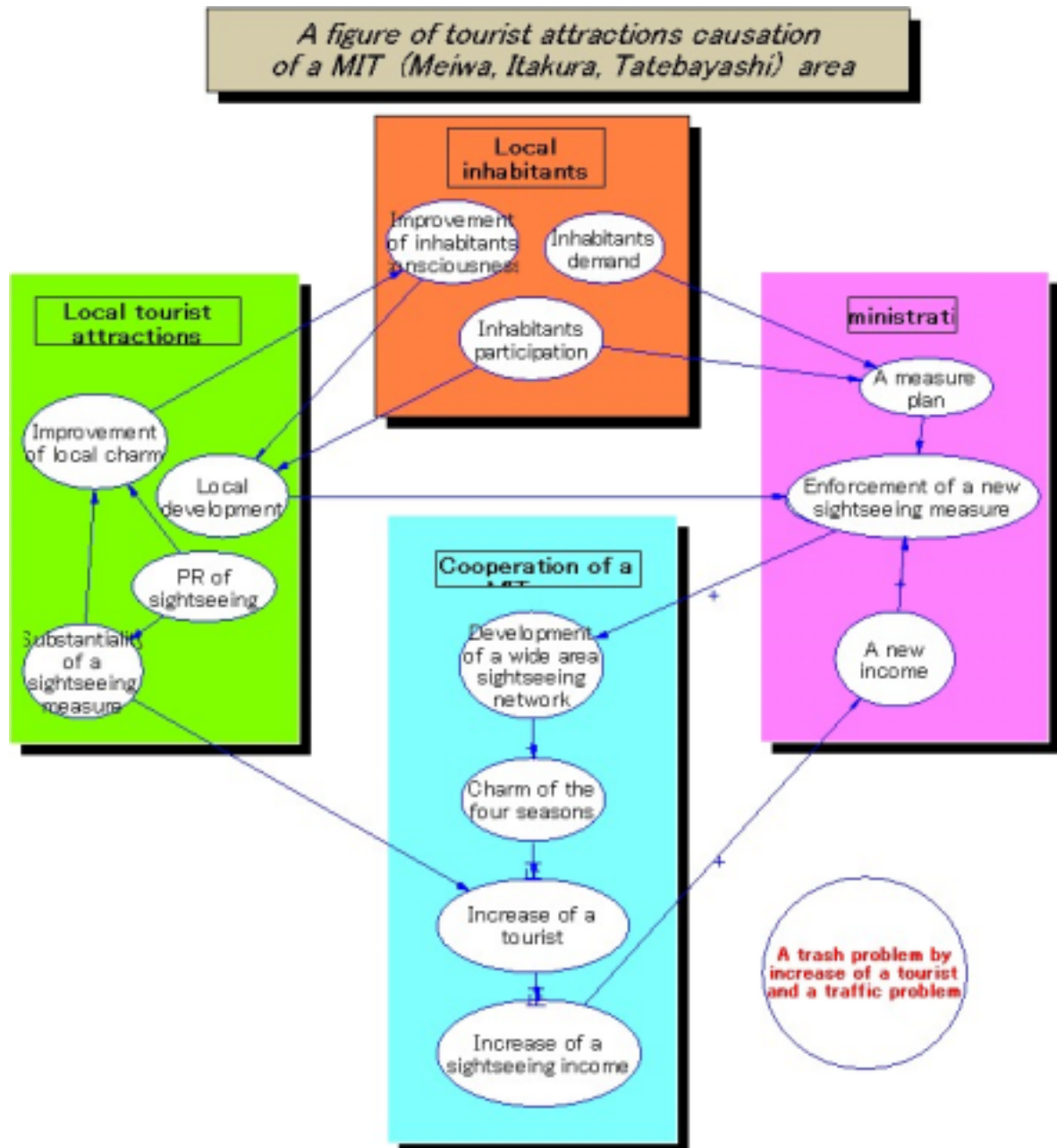
Figure 4.1.3: Local Economic Development Plan

Although the impact of these festivals and events are modest compare with other famous tourism spots, these festivals and resources are part of a local culture and daily life in an area sustained by generations. Outside participants, such as citizen of urban areas coming to join summer festivals are given the chance by local people to re-evaluate their traditional life.

In such re-evaluation or re-valuation situations, opportunities are very important for sustaining socio-economic development in the local areas. Planning staff noticed and understand that local economies not only earn cash but also sustain local culture and daily life with new valuation found through tourism industry development. This is clearly understood by drawing a birds-eye view using SD modeling tools.

In session 4.2, we wish to explain how to involve participants with a model plan for conserving rare spices. This plan starts for conserving a rare spice remained in the area.
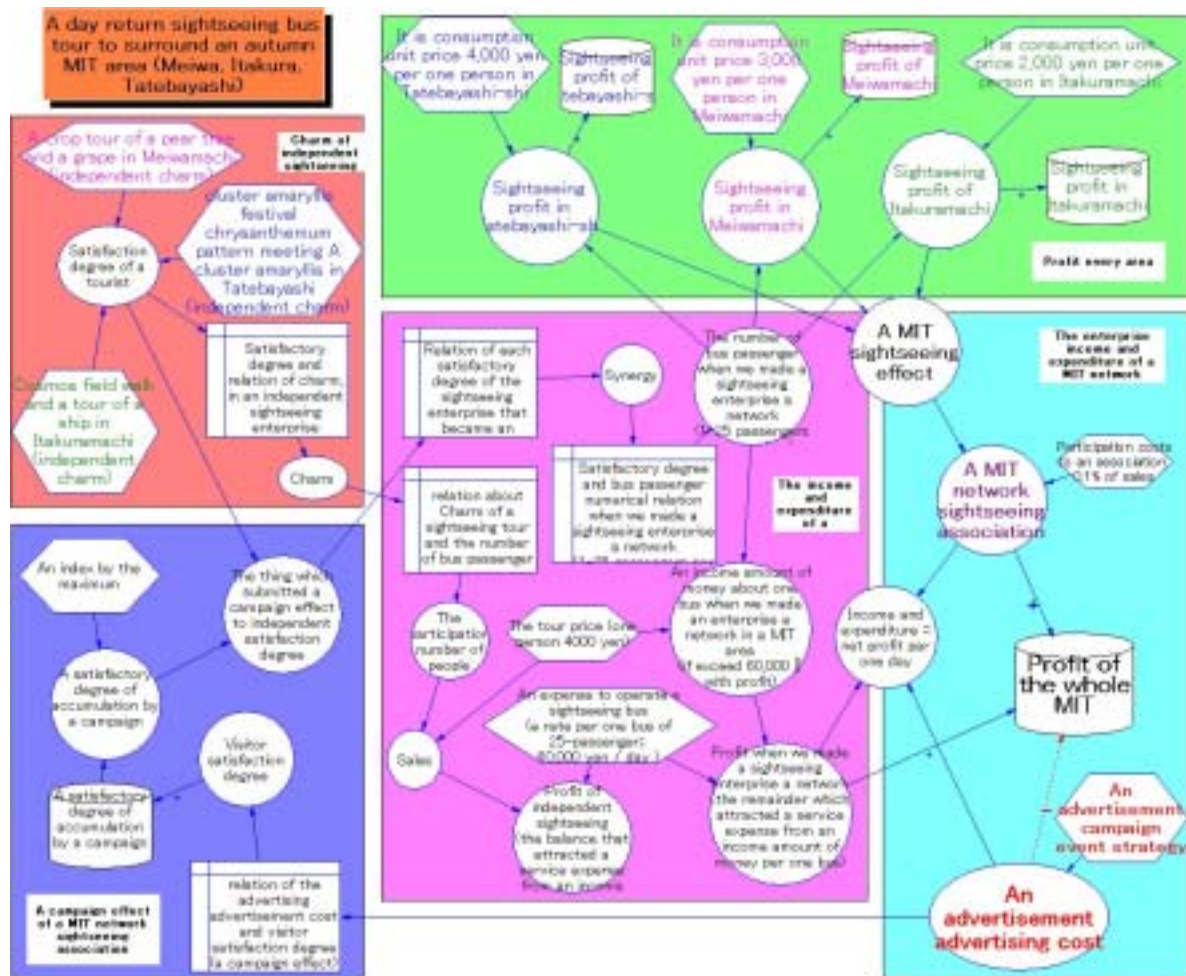
Figure 4.1.4: Bus Tour Project as one of detail plan of Tourism Industry Development Plan

4.2 Model for conserve a rare spice: Lithospermum erythrorhizon

Lithospermum erythrorhizon, a rare spice with a small white flower and a root used as a purple dye for clothing, was once harvested throughout Japan. This age old spice is also famous as a Chinese remedy to effectively reduce high fevers, digestion problems and food poison. MIT area still has a rich gregarious colony of this spice.

As conservation measures to preserve this rare spice in Japan; it is necessary to extend the knowledge of this spice while participants take a more active role in providing space for the colonies to thrive, in addition to encouraging farmers to plant and create products including Chinese remedies, dye goods and souvenirs.

Figure 4.2.1 shows a concept chart or outline of the conservation project in ST mode. During preparatory discussions the planning team found the quantity and quality of participatory involvement important, including the dissemination of knowledge regarding this spice to a wide range of people through a business linkage of products. For example, if product development and sales do not continue to increase, farmers hesitate to plant and grow the spice. In addition, promotion of products using this plant and new product development are necessary to increase the demand of goods. Food containing lithospermum erythrorhizon is a natural food thought to be good for health. The SimTaKN ST model shows who should contribute and how it will be affected with regard to the visionary manner. It is also useful to explain to planning staff why and how participants need to contribute. Figure 4.2.2 shows the time flow of participant's involvement. Academia such as Faculty of Life Science, Toyo University will contribute to research and development as well as provide knowledge of bioscience about this spice. Older citizens

contribute by providing knowledge about products using this spice and techniques of production. The younger generation is expected to create new products to attract their age group. By creating a strong linkage with those participants the demand for this spice will increase, protecting, preserving and extending the chance of economic-development.

Figure 4.2.1: Project overview chart for conservation of lithospermum erythrorhizon

During this preparation process, the planning staff understood the importance of creating a system of cooperation by incorporate many ideas on charts and identifying linkage between participants. If they considered only conserving a rare spice, ideas of tourism industry development or the involvement of the elder generation with the younger generation may have been overlooked. While the idea of constructing a fence to protect the preservation of a flower seems like a solution, in turn it is actually not an effective method without the support and care of people. Historically, Japan has many experiences of vanishing rare spices even after the central government spends huge amounts of money to construct facilities of conservation. In order to assure the preservation of future spices it is important to spread knowledge while incorporating a wide socio-economic development of use by involving people living in the areas.

SimTaKN's new SD modeling tools makes it possible to see the whole picture of development, and if necessary, presenting simulation results of the plan. Also, in the formulating process, planning staff can understand character and opportunities of participants. With this understanding, they can work to support the contributions of people participating in the plans.
Again, unfortunately, the SD model shown in figure 4.2.1 and 4.2.2 were developed in the training session and lack the feed back loop.
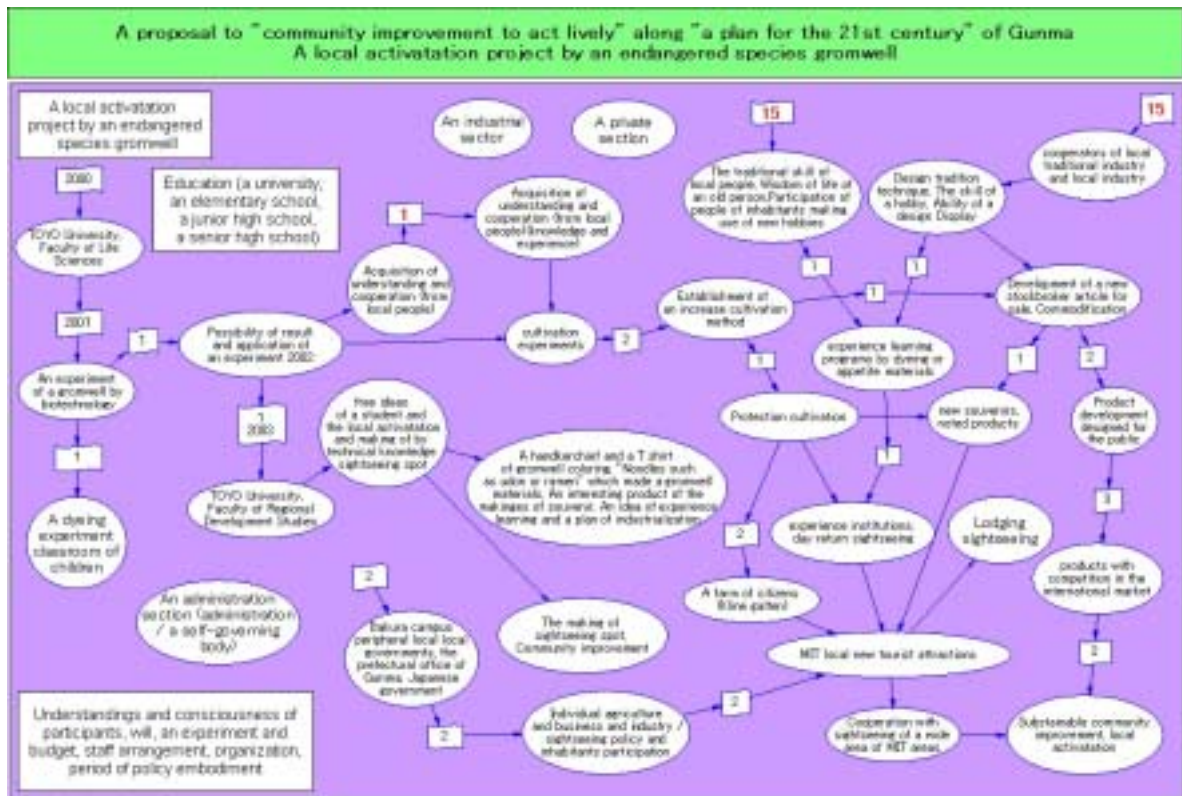
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Figure 4.2.2: Lithospermum erythrorhizon conservation project plan

5. Further study

The SimTaKN product was developed for Japanese user to help with the difficulties of using existing SD modeling tools. However, it may also assist in lending some ideas to SD model builders in other countries where English is not their first language.

This software is a card-based structure and can be use as a memo writer or concept drawing tool. Kunio Nakamura has already developed an English version of this products and user can easily download it from his home page.

Although Vensim and Powersim provide a lot of sample models in the products, we hope someone will build a richer and easy accessible model archives for covering all study areas of System Dynamics.

SimTaKN has discussion forums and asks members to assist when help is needed to formulate, develop, or implement socio-economic plans. It is a good opportunity for further study on how to make participatory development using such networks. I myself have many exciting experiences when I assisted in the socio-economic development of developing countries. I aspire to make more structuralized theories on emerging creativity development.

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