A Smart Community Reflecting Residents' Wishes: The Awaji Green Future Project

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The many issues facing Japan, including energy generation, global warming, an increase in CO_2 emissions, an aging population, unemployment and underemployment, and regional depopulation, as well as the need for a stable and efficient energy infrastructure and the need to improve the quality of life in depopulated regions, have made it important to optimize the control of energy and to create opportunities for energizing depopulated regions. Such "smart" communities are based on a visualization of the issues affecting the region's administrators and residents and of their perceptions of those issues. Fujitsu has been using Field Innovation methods of interviewing people in an area and observing their activities to identify social values that are held by the regional administrative bodies and residents. From our analysis of the gap between them, we determine the optimal community for that area. This paper introduces the Awaji Green Future Project as an example of our Field Innovation activities.

1. Introduction

Japan is currently facing many issues, including energy generation, global warming, an increase in CO_2 emissions, an aging population, unemployment and underemployment, and regional depopulation. Among these issues, a need for a stable and efficient energy infrastructure emerged after the Great East Japan Earthquake of 2011. In addition, there is a need to improve the quality of life (QoL) of people living in depopulated regions.

These issues have made it important for communities to optimize the control of energy and to create opportunities for energizing depopulated regions.[1)] Fujitsu is supporting the development of such "smart" communities.

Fujitsu conducts "Field Innovation" activities as a local awareness-raising measure for companies and organizations. We have used Field Innovation in a smart community project and have applied it to efforts aimed at providing value focused on local communities. Specifically, we have proposed the implementation of a community suited to the region based on a visualization of the issues affecting the region's administrators and residents and of their perceptions of those issues.

This paper introduces our methods and findings from a practical example—the Awaji Green Future Project, which ran from April to December 2012.

2. Overview of Field Innovation

In Field Innovation activities, it is important to find seeds of change in the target locality while engaging with local businesses.[2)] When implementing a smart community, it is important to identify community values while living in the local area and engaging with the residents. However, if we continue to use conventional innovation methods, it will be impossible to fully ascertain the time constraints or the intrinsic nature of the information that can be obtained from surveys. Therefore, in this initiative, two points were incorporated from the survey design stage to make it possible to grasp the intrinsic nature of information within a limited time span.

1) Ethnography: A methodology for expressing and understanding a region's customs and for understanding the background and significance of those customs.[3)]
2) Cognitive psychology: A theory that finds relationships between behavior and cognitive functions

such as human consciousness and memory.[4)]

In this initiative, in cooperation with Hyogo Prefecture and Sumoto City, we are using a visualization of the current situation as a starting point for a close examination of the issues facing local authorities and residents, their needs, their ideas, and the gaps between the two sides. We have proposed how these things can be addressed by a community specifically designed for the region.

3. Background and practical issues

3.1 Background

The goal of the Awaji Green Future Project was to implement a sustainable environment on Awaji Island by exploiting its rich local resources. Various initiatives are being promoted in three categories: "sustainable living," "sustainable food and agriculture," and "sustainable energy." Special initiatives have been undertaken by a partnership of residents, local authorities, and businesses among three cities (Sumoto City, Minami Awaji City, and Awaji City) on Awaji Island in Hyogo Prefecture, which were nationally designated as a comprehensive special zone for local revitalization.

Awaji Island has a population of 144 000 people, of whom 30% are aged 65 or over (as of 2010). Its main industries are agriculture, fishing, tourism, manufacturing, and local products (such as incense and roof tiles). Awaji Island has a warm climate advantageous for crop production and is surrounded by the rich aquatic environment of Osaka Bay and the Seto Inland Sea. It also has many tourism resources such as places of historical and cultural significance. It is accessible by road from the mainland of Honshu and the island of Shikoku via the Akashi Kaikyo Strait Bridge. However, it also suffers the socioeconomic problems being felt in all regions of Japan, such as slow economic growth, sticky unemployment and underemployment, and a lack of successors to take over family businesses.

The Awaji Green Future Project was aimed at developing measures that address these problems within a limited region that take advantage of the island's unique geographical characteristics. If the model that is created is successful, it can be exported to other parts of Japan and to the rest of the world. The government is especially keen to promote the understanding of this project among the local population and to maximize resident participation.

3.2 Recognition of social issues by local authorities and residents

When putting the Awaji Green Future Project into practice, the Field Innovators conducted a preliminary survey that revealed issues that needed to be recognized by local authorities and residents.

1) Issues recognized by local authorities

The district of Goshiki-cho in Sumoto City is one of the key regions targeted in the Awaji Green Future Project. For some time, we have been working on biomass utilization, a rape blossom eco project, wind and solar power generation, and welfare-oriented urban planning. The combination of these efforts has raised the consciousness of residents to some extent with regard to renewable energy. However, businesses that are planned in accordance with the government's concept may not fully reflect the needs and feelings of residents, and there has been no evidence of the extent to which these efforts have improved the lives of residents or have stimulated the local economy.

2) Issues recognized by residents

Local authorities judged that opinions of the population as a whole on social issues had been comprehensively ascertained through interviews and questionnaire surveys conducted by the government (well-being, aging response measures, transportation, etc.). However, it was thought that not enough time had been allotted to frank, in-depth discussions with residents and that the residents had not been able to fully convey their opinions.

4. Activities and results

4.1 Purpose

In the Awaji Green Future Project, we visualized the issues facing the local authorities and residents and their awareness of these issues, and we made specific recommendations regarding how a community can be set up to address these issues.

4.2 Implementation method

We set up a framework for presenting not only the perceptions and ideas of the local authorities and residents respectively, but also individual histories, future ideas, and scenarios against this background (**Figure 1**). This framework consists of logic that presents the ideas of local authorities (the "promotion side") and of the residents ("cooperation side") together with reports on

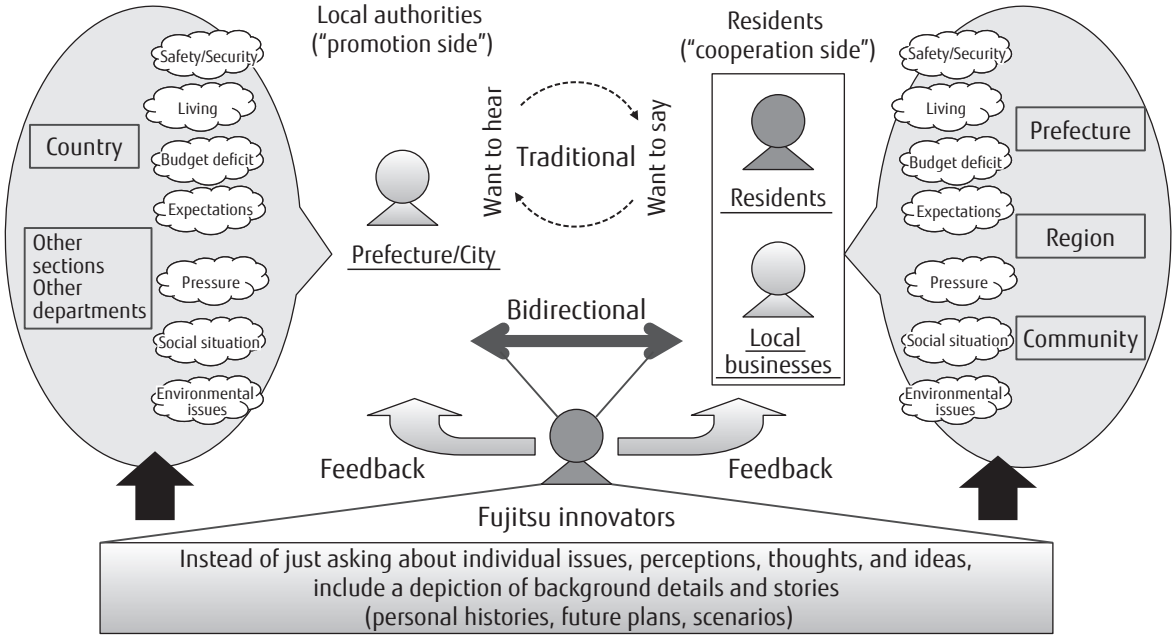


Figure 1
Model of gap in general understanding between the two stakeholders.

the empirical knowledge, history, future ideas, and intrinsic nature of each individual.

From this logic and after conducting a survey design identifying the information to be gathered and the ordering of questions, we acquired the information needed for implementing a smart community.

4.3 Investigation procedure

The investigation procedure comprised four phases—survey, interpretation, analysis, and action (**Figure 2**).

4.3.1 Survey

The survey was mainly conducted using individual interviews. However, the younger residents were averse to individual interviews, so for them we used a group workshop approach.

1) Selection of interviewees

The interviewees were selected from local authorities and residents to enable us to understand the way of life and customs of the residents. In particular, for residents, specific model cases were produced including their age/generation, environment and lifestyle, and the interviewees were asked to complete the survey form with an authority representative. The interviewees on the local authority side included people from prefectural planning, urban planning and agricultural administration (9 each) while on the resident side they included 40 people each from a wide range of sectors, including farming, fishing, dairy farming, and fertilizer production, as well as ones from trade associations and third-party sectors, former local governors, welfare officers and middle school students. Their ages ranged from 10 to 80.

2) Interviews and workshops

For the individual interviews, we designed a questionnaire requiring 1.5 to 2 hours to complete. For the group workshops, we produced progress charts and set a target time of 2 hours.

To ensure the quality of the data gathered, we made sure to gather sufficient information by using interview sheets based on knowledge of interview techniques.

3) Implementation and ordering of interviews and workshops

The words spoken during the interviews and workshops were converted directly into text documents (interview logs). As we overviewed the collected data, we collected the words that were relevant to understanding the contents during the next phase (summary

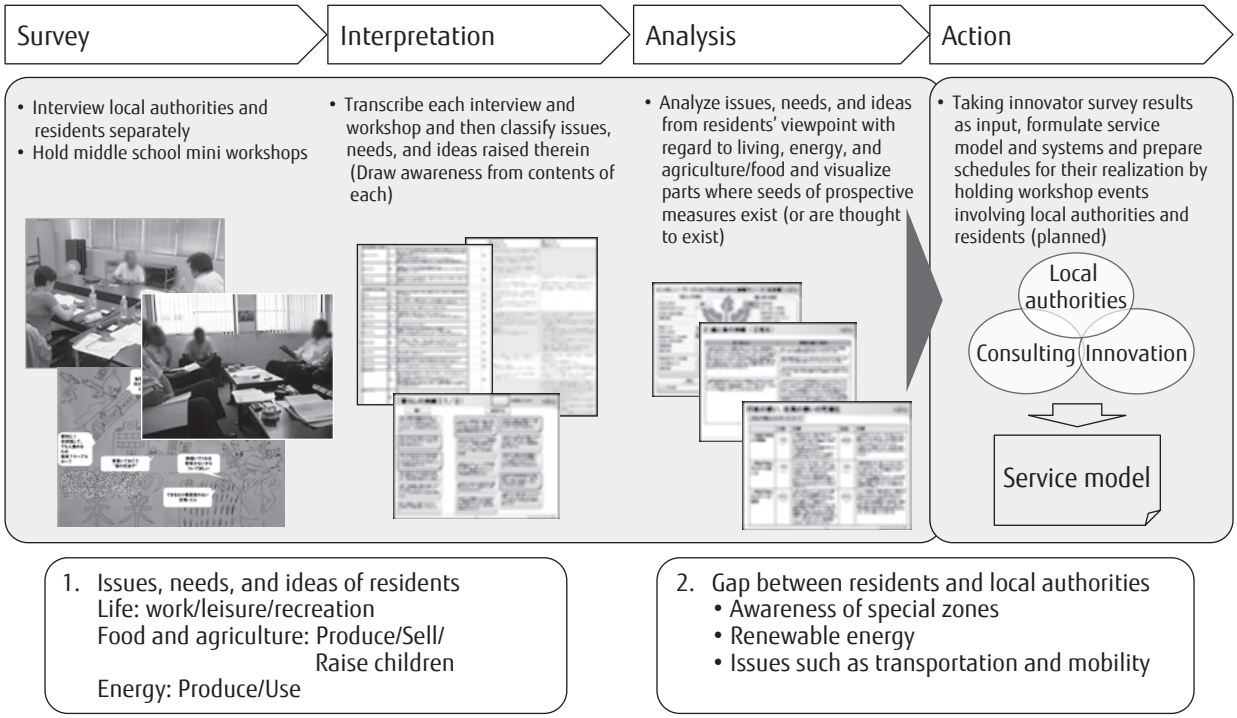


Figure 2
Research procedure.

points including actions, times, and miniaturization).

4.3.2 Interpretation (understanding and derivation of awareness)

Observations were made from various angles while brainstorming about the words collected by the innovators. Specifically, awareness was drawn from through an understanding of the context of the issues, needs, ideas, times, places, jobs, lifestyles and so on related to the three pillars of the Awaji Green Future Project ("sustainable living," "sustainable food and agriculture," and "sustainable energy.") In total 218 issues were identified, along with 109 needs and 123 ideas.

4.3.3 Analysis

With the three pillars used as a starting point, an overall image of the region was produced from conclusions drawn from the results. This image represented the desires of the residents and the form the region should take (**Figure 3**).

4.3.4 Action

Using the output derived from the interpretation and analysis results, we derived key terms and models for creating communities suited to the region.

4.4 Results

The three most important key terms we derived were "sustainable living," "sustainable food and agriculture," and "sustainable energy," which are the three pillars of the Awaji Green Future Project (**Table 1**). An example of the words connected with these terms and their interpretation is shown below.

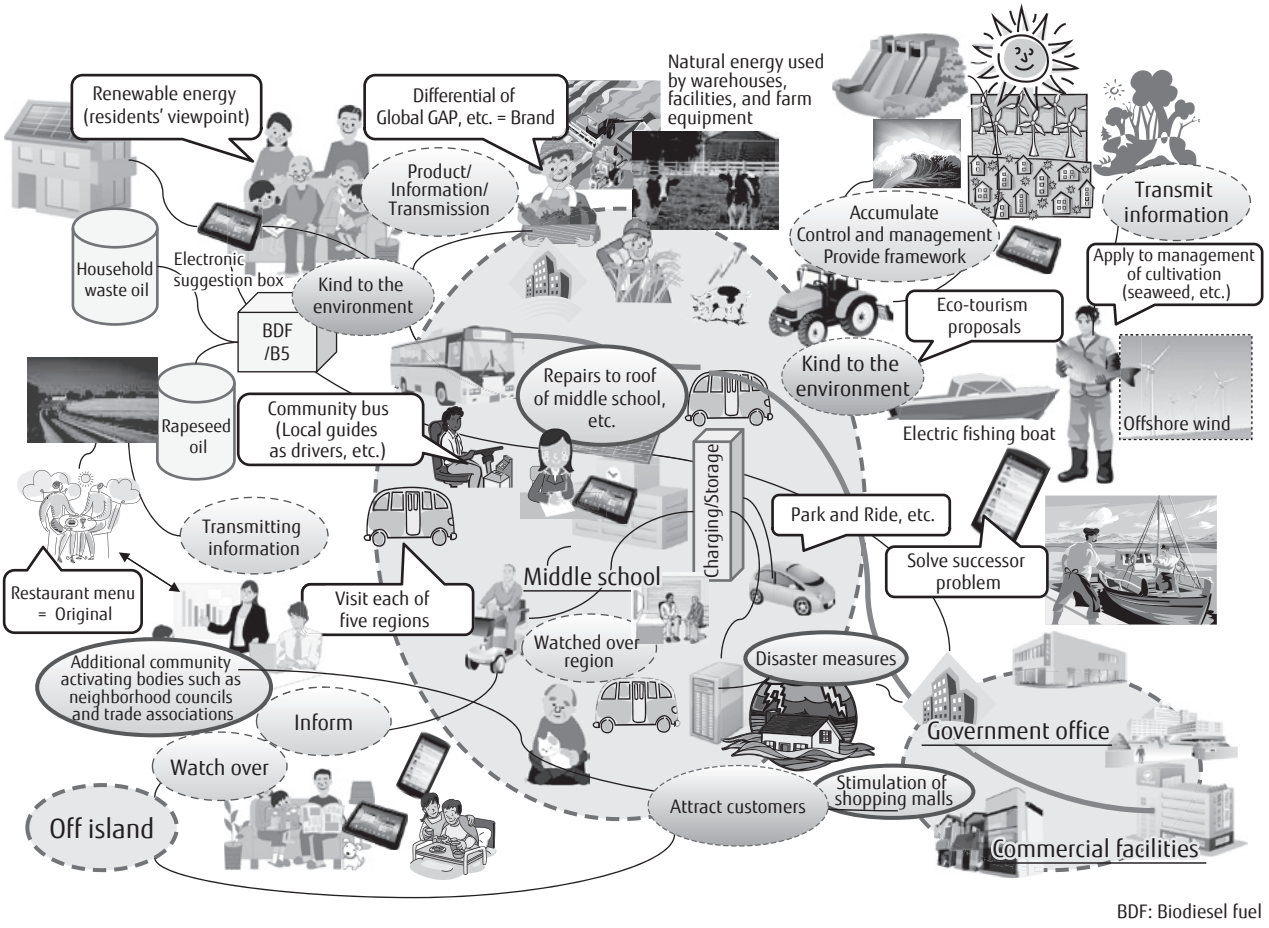
1) Sustainable living

Residents must ensure that their community actively involves a large number of people and not just a group of increasingly elderly people (welfare, local authority).

To respect the spirit of mutual cooperation between local residents, it is therefore essential to consider connections between people of all generations, and not just the preservation of physical connections.

What people (especially middle school students) want is to gradually develop local industries and other activities while preserving the natural environment.

This showed that people want to be able to



BDF: Biodiesel fuel

Figure 3
Overall image of region produced from conclusions drawn from survey results.

Table 1
Important keywords for community recommendations.

Connect	People, regions, things, information (objects)
Continue	Tradition, climate, customs
Cherish	People, nature, everyday, tradition, culture
Transmit	Customs, things, nature, ideas, workers
Change	Acceptance, adaptation, respect, awareness

continue living a rich lifestyle in a healthy environment while cherishing nature, the local culture, and its idiosyncrasies.

2) Sustainable food and agriculture

The eating of locally grown or caught food promotes the development of strong regional farming and fishing industries.

We found that, in regions where people's desires are manifested as a will to grow products and catch fish while thinking about the people who eat them, there are strong farming and fishing industries.

- I want many more people to know the town where I live. I want to make this the sort of town where I can grow up while keeping alive our traditional culture, fishing, farming, and businesses (middle school student).
- There are many things Awaji can be proud of—its onions, beef, fresh fish, its natural beauty—but they are disconnected. I'd like to see a single brand image for all of them (farmer).

These statements indicate a resolve to rediscover the strengths of the island's farms, fisheries, and the like, with the added benefit of a unified brand image.

3) Sustainable energy

- Energy is of no use if it destroys nature. An environmentally friendly system would be one where organically grown farm produce and fish caught using low-carbon fishing vessels are stored in refrigerators powered by electricity generated from

local natural resources (fishery/farm worker).

- Instead of concentrating on how energy is used and generated, we should use this as a way of improving lifestyles and stimulating the region (local authority representative).

These findings show that people want to make use of the natural environment without harming it and to use energy as a means of stimulating the region and improving the quality of life, both of which are closely related to improving one's own lifestyle. We also found evidence of "transmission" in the evaluation of new energy (including the growing awareness of the need to cherish the environment) and of "change" in people's opinions.

5. Recommendations that reflect intrinsic nature of residents

When the region's value is considered in terms of a starting point for its residents as in the above examples, it can be seen that the three pillars of the Awaji Green Future Project—"sustainable living," "sustainable food and agriculture," and "sustainable energy"—are not completely separate but are inter-related. (For example, equipment for agriculture and fishing is operated using locally produced energy, thereby sustaining the people living in the area.)

Furthermore, for these three pillars, we came to realize that being able to implement the five essential keywords shown in **Figure 4** ("connect," "continue," "cherish," "transmit," and "change") leads to the creation of a community matched to the region. It is therefore important to promote the Awaji Green Future Project in two regards: awareness of the continuation of traditional values so that the residents can connect with the next generation while cherishing the island's good qualities, its nature, culture, character, and so on and awareness of the creation of new value (as an island) by residents adapting flexibly to new social trends and making changes to improve the region and their lifestyles and livelihoods.

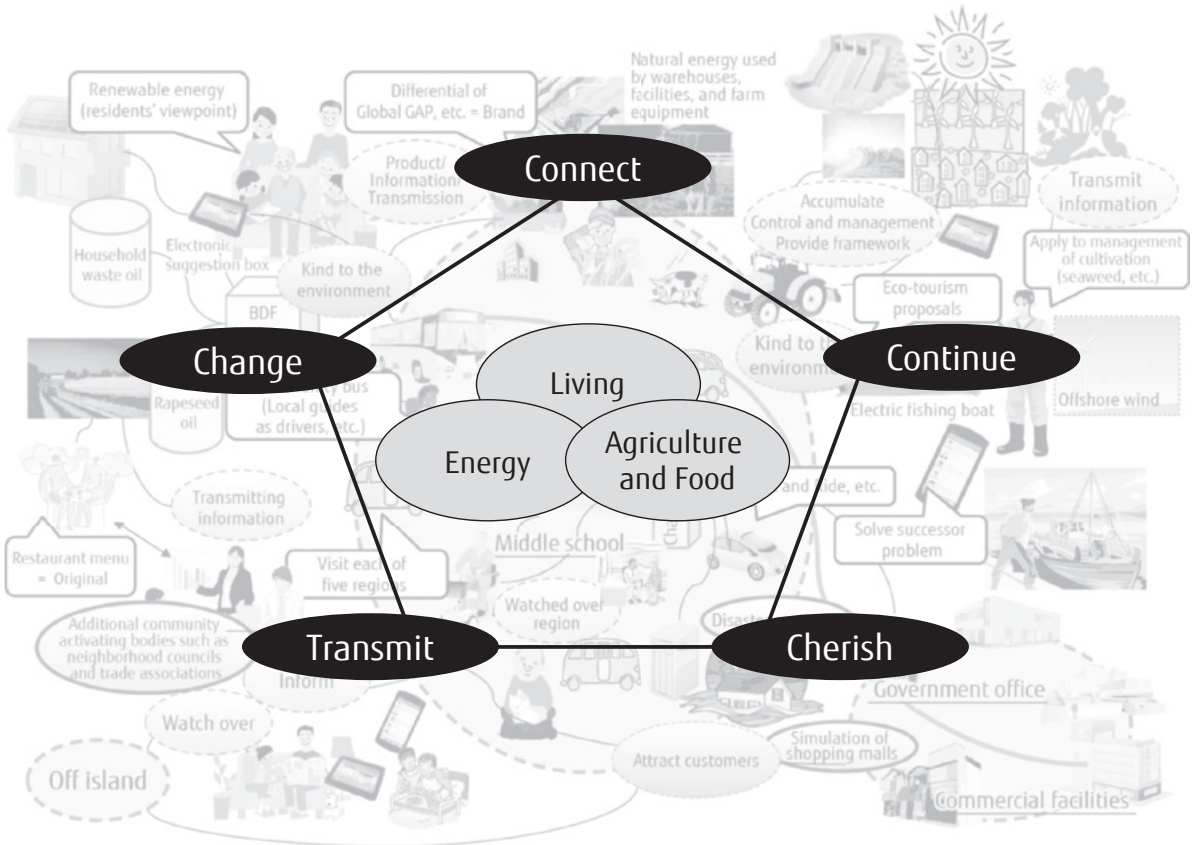


Figure 4
A model community that is both sustainable and open to innovation.

6. Conclusion

As a preliminary trial, we have carried out activities involving the application of new frameworks and survey methods based on the concept of Field Innovation in the Awaji Island region. By obtaining a clear grasp of the true nature of the background and the opinions of the stakeholders on the various issues that affect them, we have recommended the form that a community suited to the region should take.

The local authorities have accepted these results, and we hope that the results of this survey will in the future be effectively utilized as basic materials relating to all aspects of regional planning from the initial formation of smart communities in the fishing and agricultural villages of the Goshiki-cho district of Sumoto city.

Through these activities, we have ascertained the intrinsic nature of relevant issues and connected them to proposals. Moreover, the participants gained a certain understanding and a certain appreciation of Field Innovation. We have thus shown that incorporating Field Innovation methods is effective for implementing smart communities.

In the future, we hope that the ongoing implementation and application of these methods will lead to the realization of smart communities by local authorities, residents, and Fujitsu at targeted locations.

Finally, we would like to acknowledge the generous cooperation of the residents in completing this survey. Thank you all very much.

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