The Eight-strategies for regional growth assisted by the utilization of “Soil microorganism and advanced information technology”

Executive Summary

We propose the following Eight-strategies based on our recent development of new technologies.

1. Starting the survey of abandoned farmlands to measure the degree of soil microorganism diversity (‘Heisei Kenchi’).
   Creating big data file(B/S, P/L) of farmland value concerning soil microorganism diversity.

2. Promoting financial innovation by creating "farmland debt and credit market" initiated by local financial institutions.
   ‘Farmland value rating’ will save costs for local financial institutions which are facing the lack of lending opportunities.

3. Promoting the advantage of ‘Traditional Japanese way of farming’ re-affirmed by information technologies.
   Aiming at 3 birds (growth, education revitalization, and environment diplomacy) with 1 stone all together.

4. Creating various industries which have been brought by biogas and electricity generating system with enhanced productivity.
   Aiming Reforestation, Materialization of garbage, Securing 10% of primary energy.

5. Increasing the productivity by promoting 5F natural industries (Food,Fiber,Feed, Fertilizer,Fuel).
   Promoting ‘Recycle of all earth surface resources’ by utilizing microorganism and enzyme.

6. Creating the ‘New Garden City State’ of 30,000,000 people working as ‘Veranda Farmer’ and ‘Air farmer (who input agriculture information into a cloud)’ connected by SNS.
   Bringing up main players by forming the network of 400 agricultural high schools.

7. Promoting the new Renaissance movement at construction the defences of peace in the minds of men as the Constitution of UNESCO describes.
   Reinforcing the education of 3 social conditions (nature, culture and science technology) together with their correlation and diversity.

8. Sending a message about 'Start of the 8F lifestyle innovation' at the Ise-shima Summit and Tokyo Olympics&Paralympics and other occasions.
   Realizing Japan originated 21th century lifestyle(8F lifestyle) brought by natural industry and the new Renaissance movement.

(Crisis of the earth life and the revival of the Japanese natural industry)

The continuation of the earth life is impossible at present. Main reasons are the deterioration of soil microorganism diversity, the acceleration of urbanization and the intensification of global warming.

However, Japan possesses possibility of continuation even under this crisis. Because we are blessed by rich forest water and various soil minute living resources. The traditional way of farming and high technology make Japan achieve 'organic material recycling' 'carbon circulation' and 'the revival of natural industry'.

At the same time, natural industry revival is a strong engine of economic growth. In other words, net export ('export'− 'import') expands, and we can expect to press economic growth forward.

The domestic resources are (1) fossil fuel, (2) product of agriculture, forestry and fisheries, (3) recycling metallic resources. (1) and (2) are the resources recycled by sunlight, water and a soil microorganism. And (3) is included in the category of the earth surface resources.

If we are utilizing these resources and doing 3R(Reduce, Reuse, Recycle), we can realize remarkable 'product innovation' ,'market innovation'. Examples of 'market innovation' are measurement, branding, filming and story-making which is directly connected to consumer groups, through IT and technology of SNS. Moreover, if industries, academia, government and financial institutions cooperate, we can achieve 'systems innovation' and create new 'national wealth'.

(Two Ultra modern technology systems to contribute to life maintenance<food and energy>)

The two ultra modern technology systems, which are main subjects in this work shop, were both discovered by Japanese researchers. One is the evaluation system of 'soil microorganism diversity and the activated value' and the other system is

'the high speed, high-efficient biotechnology system to produce methane gas', which was a core project of the workshop last time. After the workshop, this system was examined by various experiments, plant business and 'Feed-in Tariff Program(FIT)'. Moreover, it was also checked about the real situation of the methane gas electricity generating system in Hokkaido.

Consequently, we found that organic resources except for the citrus skin become feed of methane bacteria supported by 'water nano technology'. Compared with the system of the usual type, it was confirmed that the productivity of the methane gas is 2 times higher. And drainage after processing was harmless and it was revealed to contribute to improvement of a natural environment. Local governments including Ishikawa prefecture consider adopting this system aggressively.

When it is judged from a macroeconomic point of view, we can get 10 percent of the Japanese primary energy supply. And it will be able to be profitable within 10 years payback of initial investment. It is a very big business chance in the area for financial institutions which face difficulties in finding lending opportunities.

Another technology is the evaluation system of 'soil microorganism diversity and the activated value'. It was not possible to visualize soil microorganism diversity in the past, but this technology has enabled to visualize soil microorganism. We discovered about 1,000,000,000,000 microorganisms exist in the soil of 1 gram. The Japanese soil is very rich and abundant by 'Japanese traditional organic farming'.

This way also has been strengthening 'soil microorganism diversity' and making them maintain the high productivity. Therefore, Japanese traditional way of farming is a very advanced way of farming.

Moreover, we discovered the fact that 'soil microorganism diversity' in the aband oned cultivation place was estimated as rich soil as around 1,900,000 unit (above 80 deviation values).

On the other hand, the Agricultural Co-operatives law was revised in August, 2015, so corporate investors including foreign corporates will be able to possess as much as less than 50% of a Japanese farmland (effective April, 2016). We should recognize our farmland has the best value in the world.

(Policymaking for local area development through by big data gained from soil)

The first thing we should do is to check soil in the whole country and build the 'big data of farmland value' (we name it 'Heisei Kenchi').

At the same time we should make the 'farmland debit and credit market'. This market will increase a financing innovation. This innovation and new loan to biotechnology methane gas industry will strengthen the local financial institutions. Eventually, local economy will be strengthened as well.

Next step is to export this technology to foreign countries as 'Traditional Japanese way of farming'. By this way we can aim at 3 effects, namely 'growth', 'education revitalization' and 'environment diplomacy'. Especially about rapid soil degradation (So-called food problem in 2025<Point of No Return Problem>), it seems that our technology is the strong solution to solve this problem.

Japan is blessed with the various natural wealth such as 'Forest, Village, River and Sea<Mori Sato Kawa Umi>'. And we have developed 5F natural industries (Food, Fiber, Feed, Fertilizer and Fuel). With 2 big technology systems mentioned above, we can develop into strong movement of 'Recycle of all earth surface resources'. This also cordinates with the destination of the 'Mori Sato Kawa Umi project' of the Ministry of Environment.

Moreover, this innovation would also contribute to construct the 'New Garden City State'. By 'Traditional Japanese way of farming' we will be able to build an agriculture personnel system 'So-called SNS 30,000,000 farmers'. We call them the 'Veranda farmers' and 'Air farmers (who input agriculture information into a cloud)'.

Of course, to realize this project, we need the cooperation of the 400 agricultural senior high schools in Japan. These students' effort is necessary for realization of such plan.

(The revival natural industry and the importance of the new Renaissance)

Philosopher Imamichi Tomonobu, Honorary Professor at University of Tokyo, proposes the importance of '3 environments (nature, culture and the technology) combining' which are based on the critical aspect of nature, Western liberal arts to succeed philosophy of Greek and 20th century science and technology.

At this workshop we were suggested the practice of this philosophy from Hideaki Koizumi who is a cerebral scientist .

First, the importance of the unity and the diversity which are gained by cerebral science (nature, culture and scientific technology). Second, the importance of the agricultural experience and the child education. And third, the relationship between the revival of natural industry and the traditional cultures. This is the latest knowledge.

Moreover, Yoshiyuki Matsuda and Koichiro Matsuura suggested 'Diversity is the most important word'. The most important concept is 'diversity of a microorganism' and 'diversity of living things' for the revival of natural industry. 'linguistic diversity' and 'cultural diversity' are also important for the revival of traditional cultures.

Therefore, an important thing is to develop the world's cultural and natural heritage movement at construction the defences of peace in the minds of men as

the Constitution of UNESCO describes.

If we are developing such movement, the Japan-originated "8F lifestyle Industrial Revolution" will be embodied. 8F is the concept that 5F(Forest, Fuel, Fashion, Family and Felicity) is additionally combined with 3F(Farm, Food and Festa) current movement.

We should promote these concepts at the Ise-shima Summit or Tokyo Olympics& Paralympics, in the hope that these concepts expand internationally and are recognized as the 21st century lifestyle innovation.

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