Environment Friendly Agricultural Brand “Cool Vege” Through Carbon Sequestration by Biochar for Sustainable Management of Food and Water Cool The Earth from The Dining Table with COOL Vege

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ABSTRACT

The reduction of greenhouse gas to mitigate or adapt to drastic climate change are one of the most important issues for human beings. On the other hand, rural development is also important issue for sustainable rural natural resources to secure food and water. Then, we propose the new socio-economic scheme to solve these issues at the same time through biochar carbon capture and sequestration. This scheme contains 4 measure factors that 1) Carbon Capture & Storage(CCS) via biochar, 2) Biochar CCS should be carried out at agricultural lands for rural development, 3) Biochar CCS should be monitored and measured to generate carbon credits and social creditability, 4) The ECO-brand “Cool Vege” for agricultural products derived from biochar CCS. And, it consists of many stake holders and actors that local community, compost center, farmers, CCS local committee consisted by local governments and universities as scientific authority, companies, retailers and normal citizen as consumers. Therefore, when proceeding this scheme, it is needed to have holistic aspect like bird view.

Key words: Biochar, CCS, Carbon credit, COOL VEGE, rural development

INTRODUCTION

Mankind is facing serious threats that sustainable supply of food and water will not be able to be maintained in near future. In order to avoid these issues, sustainable management of regional natural resources such as “forest, mountain, river, sea, farmland” is essential. And, these resources as landscape have been sustained by rural area. Therefore, rural area is a very important actor to support sustainable supply of food and water to mankind.

Now in Japan, depopulation due to downturned industries and a decline of agricultural income in rural areas and the associated devastation of rural environments are major problems.

It has been quite a while since people started arguing for development of such areas.

While it is anticipated that businesses and companies will face restrictions on greenhouse gas emissions within several years in urban areas as a climate change mitigation measure, there are in fact only a few specific and effective methods for greenhouse gas reduction. In addition, although general consumers (citizens) may be highly conscious of the necessity of cooperation regarding environmental problems, they do not have many avenues via which to take action.

The reduction of greenhouse gas to mitigate or adapt to drastic climate change is an urgent issue. The transformation of biomass into a form not easily biodegradable without burning it, that is, carbonization of organic substances in an oxygen-free or low-oxygen atmosphere to create inorganic hard decomposed carbon (hereinafter referred to as “biochar”), and the physical utilization of the biochar as a soil improvement agent for agricultural lands, etc., enable us to sequester carbon under the ground for a long time and reduce the amount of circulated carbon above

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the ground. In other words, it is a system of carbon capture and storage (CCS) by biochar (hereinafter referred to as the “biochar CCS”). This system can be an effective and convenient method of reducing carbon dioxide in order to mitigate climate change.

Accordingly, we would like to suggest an outline and identify the issues associated with a general social scheme of sequestering carbon through biochar CCS on agricultural lands in farming villages for agricultural revival and other regional development. More specifically, the biochar CCS should be carried out for agricultural lands to generate carbon credits, and simultaneously a regional brand should be established for agricultural products from the agricultural lands as COOL VEGE TM, which means “vegetables that cool the earth by carbon sequestration with biochar” to increase their commercial value and sales appeal to consumers as “Environment conscious agricultural brand” and/or “Environmental Friendly”. This is a new concept, because normal consumer understands concepts of “safety” and “taste good”.

MATERIAL AND METHODS

Specific proposal “Carbon Minus Project Scheme” for establishing the social framework. The specific proposal of the social frame work named “Carbon Minus Project Scheme” is showed the structural scheme on Figure (Figure.2) .

Scenario flow.At this scheme involves the following scenario, 1) local community produces biochar using local un-used biomass, 2) compost center mixes compost and biochar which is purchased from local community, 3) farmers buy compost char which was produced under quality control from compost center to put into farmland and produce and sell “Cool Vege”, 4) CCS local committee consisted by local governments and universities as scientific authority certify the carbon sequestration by biochar compost at farmland by the documentation from compost center, and issue the carbon credit and deliver the sticker of “Cool Vege” to

farmers , 5) companies buy the right of carbon credit and advertising space on “Cool Vege” sticker and signboard from committee, 6) retailers sell “Cool Vege” as special eco and regional product, 7) normal citizen as consumers are buy “Cool Vege” with the consciousness of participation in eco activity of Carbon Minus Project.

Figure.1 Sustainable Low Carbon Society

Factors of Carbon minus project. Carbon minus projects contains 4 measure factors as follows;

Carbon Capture & Storage (CCS) via biochar. The most important and basic factor is CCS as long as this project insist “carbon minus”. This should be verified below zero (carbon) minus) by LCA-CO₂ (Life Cycle Assessment by carbon dioxide) from local biomass collection up to farmland CCS by biochar compost such as Processes from collection, storage, carbonization, transportation and input in agricultural lands.

Biochar CCS should be carried out at agricultural lands for rural development. As long as proceeding the biochar CCS, the cost of biochar producing and its input at farmland in rural area, should be shouldered by somebodies such as companies and/or consumer in urban area. In this scenario, It is not enough to covered by only carbon credit, as its price is so cheap. Therefore, such not covered cost should be shouldered by the products sales which are grow at CCS farmland.

Biochar CCS should be monitored and measured to generate carbon credits and social creditability. In order to proceed this eco-socio scheme, biochar CCS have to be convinced effective method to mitigate CO₂

by the stakeholder and actors, especially companies and consumer as cost shoulder. Therefore, to maintain the quality of carbon credits and social creditability, it is needed to system of monitoring and proper quality control.

The ECO-brand “Cool Vege”. As long as the price of carbon credit is so cheap, the cost

of CCS should be shouldered by selling of products generated by CCS farmland. In this context, the measure method is the new regional eco brand “Cool Vege”. This brand involves the clear context of “Ecological” for easier purchase by companies and consumer.

Figure.2. Carbon Minus Project Scheme

RESULTS

As a result, the system will promote the purchase of carbon credits and Company Social Responsibility by businesses and companies in urban areas and other entities, as well as the sales of regional brand agricultural products with high additional value to regional and urban consumers.

We can consider this fund reflux method from urban to rural areas by greenhouse gas reduction by utilizing biochar as an effective measure in creating a sustainable low carbon society (Figure 1) where urban and rural areas can coexist.

CONCLUSION

It would be our utmost pleasure if this social scheme for sequestering carbons in agricultural lands by using biochar produced by carbonizing unused local biomass were to be realized soon, and reduces greenhouse gases, and at the same time contributes to solving regional problems and poverty not only in Japan but also in other countries around the world.

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