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ASIA GROWTH STRATEGYIN AGRICULTURE

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ABSTRACT

ASEAN Economic Community is established in 2015. It is obviously knownthat the main purpose of the establishment and role to play are to activate and revitalize Asian economy under theslogans of one vision, one identity and one community, however a little bit difficult to understand clearly to findhow it can be tightly united focusing atwhat project should be aimed as the main framework for the final goal achievement. Inthis paper the authors would like to introduce and propose one of the ideas on what the project should be focused and how it should be promotedin sharing the understanding commonly among the ASEAN countries involved in the community.

Keywords: Asian agriculture, Growth strategy, Smart agri, Food giant, Asia brand food

INTRODUCTION

We human beings are already facing two global issues of energy and environment since the climate change issue was closed up as the global warming due to the huge amount of CO2 production mostly caused by the combustion of fossil energy, therefore the CO2 production is directly proportional to the fossil fuel consumption based on the industrialization for economic promotion. In recent years various possibilities of energy resources different from fossil energy are proposed. Renewable energy hasbeen closed up from the environment friendlyviewpoint. Bio-based energy resources are closed up and recommended due to carbon neutral concept. Plant is grown up based on the photosynthe-sis absorbing CO2 and discharging O2andthe discharged CO2 is always less than the absorbed one while growing. As far as bio-resources areused as the energy resource, the total amount of CO2 is not increased, but keptalmost constant. This situation can be maintained as far as the bio-based energy resourcesare utilized.

ASEAN Economic Community establishment is scheduled in 2015. How Asia can be united by this community establishment depends totally on how ASEAN can get together and cooperate in which industrial sector. ASEAN consists of totally 10 countries and agriculture is one of the common primary industries in most of the countries involved and they are relying on the national income from agricultural production more or less. From this point of view, they look comparatively easier to collaborate and compete each other if they can consider the agriculture as the common interesting sector for promoting economy as one community. It is well known that Asia has higher poten-tiality of huge amount of bio-resource production including food resources. Bio-resources include mainly four kinds of resources available for food, energy, material and environment. It is strictly emphasized that bio-energy shouldn't be produced from food resources because the food price will be going up and the people facing to poverty and hunger are forced to face more difficult to get food. This is easy to understand, however it means that bio-resources can be used as buffer resources available for both of food and energy production depending on case by case. Almost one billion people are eating malnutrition food. Food amount/capita/per year is almost equal to 400 kg which can be simply calculated dividing the total food production by world human population. It looks almost enough, however this is only the case when the food can be shared equally. Unfortunately food is not actually distributed and shared equally. It seems as if it is enough, however it is

unfortunate that food is not equally distributed or shared. Unfortunately food is not actually distributed and shared equally. It depends on the economic trading basically. This is the reason why we have almost one billion mal-nutrient populations. The total amount of food production looks actually almost enough to share if distributed equally, however it is not done as the matter of fact.. To solve the food issue, the followings must be considered basically. 1) Total amount of production enough to share or distribute, 2) Food must be safe and quality controlled to secure the safety and 3) Mutual liability between producer and consumer should be maintained thoroughly.As already mentioned above, Asia is producing a huge amount of bio-resources including food resources, however as far as we concerned with food, it must be safe enough. Agricul-tural mechanization has two main roles to play as we are concerned: 1) One is to produce agricultural products enough under high efficient condition of saving energy, time, labor and material by use of automation technology and 2) The other is to produce uniform, quality controlled safe food products, because these can't be achieved so easily under small scale farming condition. Huge scale of farming reduces the operation stages and shortens number of operations through their simultaneous parallel combination by automation. Considering the background situation of Asia mentioned above, agriculture should be recognized as the most important industrial sectors in Asia. Ito has been presenting a series of papers related to growth strategy and technologies in recent five years. [1] – [9]

GROWTH STRATEGY CONCEPT

2.1 Objective

The main objectives of the growth strategy proposal are shown as below.

1) Most of Asian countries are stil depen-ding on the economy from agricultural production, therefore it is necessary to promote agriculture and make Asia a qualified Food Giants in enough production and supply of the quality managed and safety guaranteed food to all over the world timely on demand

2) For the vitalizationand promotion of Asi-an economy the jointcollaboration and mutual competitionmust be materialized between res-ource oriented countries and technology oriented ones each other

3) Not only to transfer the developed andinnovated technology, but also the human resources development should be promoted based on the mobility program through ASEAN Engineering Consortium including the young staff and faculty

4) To make Asia a world food giant, the Asia brand food products should be developed and grown up with the safety guaranteed

5) To ensure that the same level of high quality controlled food productsshould be obtained and purchased anywhere in Asia

2.2 University Social Responsibility

The collaborative research project should be contributable a lot to the regional / international society and community. To promote the collaboration jointly, one common issue should be picked up as the target for final goal and solved by use of the knowledge and expertise of the specialists involved or professionals invited to join getting together from the different necessary academic areas for solving the problem. Especially when it comes to think about the project proposal from the university, the social responsibility should be also considered how much university can play her role to contribute through the project, therefore one of the most important roles of university is to fulfill the social responsibility through both of research & education activity. The word of "Social" means here the local, regional and international community or society depending on case by case. Multi-disciplinary human resources development is extremely needed in engineering education for growing the future engineer enough to communicate and understand the people coming from the different academic areas because they have to work together jointly to achieve the same final goal of new product development considering so many factors affecting social and natural issues like global warming

2.3 Multi- disciplinary education

As mentioned already to conduct the collaborative research project, the researchers and scientists should be qualified enough to communicate and understand what the other academic area peoples say. Even for the students to be grown up for future human resources, the multi-disciplinary higher

education should be provided in addition to the sense of responsibility, cooperation and leadership in addition to understand the purpose and role to play what they must do. University should offer the holistic education program for students to equip fundamental multi-disciplinary knowledge enough to communicate with the different major experts irrespective to their major academic field.

First of all it is necessary to clarify which types of agriculture should be targeted and focused on for joint collaboration research project. There may be found that agriculture can be classified into the following three (3) types based on the purpose mainly. They are 1) Hobby Agriculture 2) Environment conservation based agriculture and 3) Agriculture for the purpose of promoting agri-business as industry. First two types of agriculture 1) and 2) are not directly related to agri-business and mostly different from economy. Agriculture under discussion here can be classified into the third type agriculture mainly focusing on the promotion of agri-business and vitalization of economy as one of the primary industry sectors. In addition the farmers must be able to live on farm enough to be competitive and rich enough econo-mically

The reason why agriculture should be targeted as one of the growth strategies is explained as follows. Asia has higher potentiality of natural resource production especially rice, not only food, but also the other purpose use resources such as palm oil and sugarcane available for bio-energy production. The total amount of agricultural resource production is tremendously huge, therefore Asia can be qualified as a world food giant, however as far as concerned with food production, the food safety must be strictly secured and guaranteed especially for mankind. Most of the countries in Asia are more or less relying on the national economy from agricultural production as already mentioned above. There can be seen some differences in crops-growing can be seen, depending on difference in growing crops depending on individual countries, however rice is commonly cultivated in most of the countries. Sooner or later the food production may be urgently needed considering the rapidly increasing human population. Even now we have almost one billion malnutrition people in the world. The preparation should be started immediately for negotiating and overcoming the upcoming food issue as soon as possible in community base.

2.4 Steps to follow for agri-business

Asian agriculture can be typically characterized as small scale farming in most of the countries involved. The scale up of farming takes time due to many factors not only technological but social ones. It should be however inevitably promoted sooner or later to strengthen the product competitive-ness in world market in reducing the production cost and increasing the quality of final products. In addition it should be notified that the food safety must be one of the most important factors. Mechanization hadn't been promoted so quickly under this condition because the rapid mechanization makes the social problem such as jobless people increase caused by taking over the job opportunity of cheap laborers and workers. Farming scale must be scaled up gradually toward the future from the agri-business viewpoint for the purpose of economic promotion. For higher efficiency and income increase from agriculture, the farming population should be reduced essentially and agricultural mechanization must be promoted. Then the "agrimation" should be followed, which is newly made abbreviated expression of agricultural mechanization and automation around in 1983. It is natural to learn from the history that the farmers must follow this process to overcome the competition and survive as far as they are classified and categorized as the agri-business worker keeping higher stable income economically. Precise operation control is getting needed to improve the operation efficiency in eliminating unnecessary time consuming stage of operation process and combining them a series of simultaneous concurrent operation. High quality controlled food safety and management must be more importantly requested to deliver especially for famous brand food industry for value adding and human health care.

RESOURCE ORIENTED & TECHNOLO-GY ORIENTED COUNTRIES

3.1 Importance of collaboration & competition for mutual benefit and prosperity

Asian countries can be classified into two categories including 1) Resource oriented

countries and 2) Technology oriented countries. For the successful further promo-tion of economy, the collaboration should be done between both countries. This promotes and revitalize Asian economy & agriculture and it brings mutual benefit and prosperity. In addition the collaboration makes the competition even among the countries. Then the technology may be newly developed and innovated in addition to the human resources development Economic promotion and vitalization contribute in regional peace keeping and political stability in Asia.

Fig. 1 shows the project scheme of Asia growth strategy. ASEAN community consists of ten countries and the additional three called as ASEAN plus three are China, South Korea and Japan in which they must have the important roles to play to support ASEAN community in many ways. At the first level of project implementation two universities should have initiative between core key university and counterpart one, then gradually the number of project member should be increased considering the project progress and the program contents. Fig.2 shows the process to follow up to the final goal achieve-ment. Unfortunately the agriculture is not a strong industrial sector in Japan even though the agricultural technology has been developed in many ways. Due to the rice production control policy continued more than a half century caused by the overproduc-tion of rice, no technology transfer and the future successor growing could be done. Additionally the engineers and experts involved in the technology development are retiring now even though a huge amount of budget has been invested. Who will be getting benefit from this? Production control should be introduced just for a short term, not for a long term. Subsidy and financial support to the farmers must be continued using tax under no income condition as far as the policy is continued. The increase of consump-tion and demand of rice should be the policy instead based on the principle of economy.

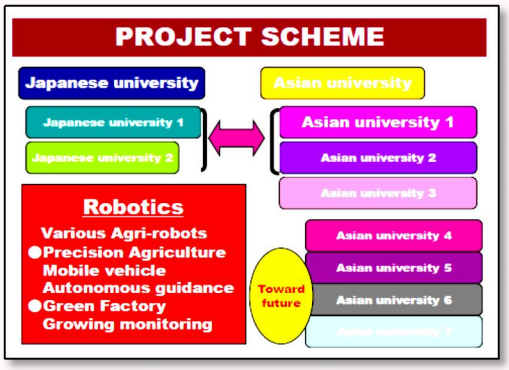

Fig. 1 Collaborative Research Project scheme

3.2 What program the project should be focused on

Based on the current situation of Asian agriculture, the high tech mechanization seems to be too early to introduce and apply, however one of the most important points is to start the preparation immediately to be ready to access the upcoming food shortage issue in future. For the past three decades from 1960 to 1990, the cultivated land has not been increased and kept almost constantly without increase and decrease in spite of new farmland reclamation.

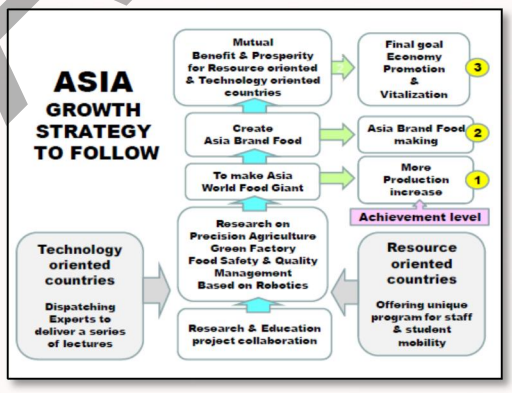

Fig. 2 Asia Growth Strategy process

3.3 What program the project should be focusedon

For the past three decades from 1960 to 1990, the cultivated land has not been increased and kept almost constantly without increase and decrease in spite of new farmland reclamation.

Farmlands have been newly developed, but most of them have been lost due to erosion and natural disaster on the other hand. It can be concluded from this fact that the new farmland development seems to not be effective even in the future. Three dimensional efficient utilization of space may be more effective. One of the hopeful examples of possibility for this

purpose will be a Green Factory. The project content should be as follows. Robotics can be commonly applicable to the other two technologies of 1) Precision Agriculture and 2) Green Factory. As the partial or main important functional mechanism. Robotics is one of the most important growth strategic sectors requested to promote even in Abenomics proposed by The Government of Japan recently. Robotics in agriculture is also one of the important growth strategic sectors as well, however the practical operation how it can be promoted should be shown. Those technologies mentioned above are called "Smart Agriculture" the application of ICT, (Information & Commu-nication Technology). Robotics is one of the key technologies having higher potentiality in reducing the production loss in both of pre and post – harvest stage of operation.

3.4 Reason why Japanese university is included

At the initial stage of project operation, the mutual understanding about the concept and philosophy of the project should be promoted and confirmed among the members involved in the project organization. In addition to the informa-tion providing and knowledge transfer view-points, the professionals. and experts should be invited to deliver a series of lectures related to their works on those topics to the students and staffs. Higher level of knowledge should be obtained through this series of lectures and guidance by the autho-rized professionals. Even in case of budget proposal to the Government of Japan, it should be done jointly through Japanese university. Or joint research proposal can be done to both organization, NRCT and JSPS, however this should be discussed more for further details in final stage of decision making. Considering the future aspect more partner universities should be invited to join from Asian countries for further promotion of the project.

3.4 target crop & required technologies

There are so many hopeful bio-resources and agricultural crops for food and energy production. One of the most important staple food crops is rice growingup in most of the countries in Asia. No reasoncan be found not to focus on this important resource. It should be considered as key resource with the first priority from thefollowing viewpoints of 1) More than 90% of world rice (6.8 hundred million ton) is produced in Asia, 2) Rice is one of the most important main staple foods in Asia, 3) Production increase is comparatively easier to cover the increasing-human populationdue to the stable cultiva-tion technology, 4) Multi-purpose use of ricecan be one of the possibilities include-ingfood and energy productionin addition to the new product development possibility.

3.5 What must be done in project

It is already described that Asia has higher production of food even now, however more production are needed for more supply. Some of the academic area contentsneeded for research & education programs areshown as follows. 1) Food Safety:Traceability (Image processing)& Quality control & management, 2) Teleme-try measurement:Various sensors-Remote sensing andTele-communication, 3)Pattern recognition / Data readingdevice (unit), 4) Value added new products productionsuch as environment friendly products, 5) Crop growing rate monitoring & control for good tasteand higher yield production, 6) Automatic data acquisition & sending for con-tinuous monitoring and observation of target crops while growingby field serverfor information sharing, 7) Handy portable device &unit for checking and monitoring NDVI (Normalized Difference Vegetation Index)with easy communication function by handy peripheral device even by use of mobile phone.

3.6 Student & staff mobility

In along with the main project, mobility program should be promoted for the purpose of human resources development. Facility based education programshould be offered from the viewpoint of efficient use of facility sharing and further promotion of mobi-lity.Subject based education program. This is almost the same concept as mentioned above. Special unique program should be offered from the member universities. Credit transfer should be done even for above mentioned both programs.Some of the universities have special facility focusing on special skill up education program. This is defined as facility based program. The program should be focused on the facility use and the university some of the universities can offer their strong unique original academic special program. This type

of program is named subject based program.University selects and picks up the program categorized based on this concept even though the further discussion should be done on which university can be responsible for which program must be donemutually. International symposium/workshop/ conference should be organized and held regularly to confirm the program progress and to deepen themutual understanding and friend-shipamong the participants.Technology transfer to extension should be validated regularly how much it was done. Even for the human resources development the evaluation and validation should be done regularly and continuously based on the qualified number of graduate program students for Ph.D and Master degree holder. Project activity and performance should be also reviewed and evaluated annually for further project promo-tion based on the number of publication, applied / proposed number of patents, joint program with external organization such as industry and commercialized products based on the idea based on the idea coming from the collabora-tion achievement

CONCLUSION

The followings are the conclusions derived from the discussionin this paper as some of the effective meritswhen the concept is materialized and implemented.

1) The strategic growth concept was introduced focusing on the agriculture in Asia how it should be developed and implemented for economic promotion

2) Main keypoint is the collaboration and competition between resource oriented countries and technology oriented ones for making Asia a world food giant and create one of the most reliable Asia Brand of food

3) The collaboration will be a big contribution not only in Asia, but also in the world in providing a massive plenty of food to the people facing to poverty and hunger

4) Two types of countries need the resource and technology respectively for mutual benefit and prosperity each other

5) Final goal of achievingboth technology transfer and human resources development can be successfully accomplished

6) Regional peace keeping and political stability can be secured in addition to economiy

7) Technology oriented countries should show the attitude actively to join and collaborate for the merits mentioned above

8) Evaluation of project / program should be regularly reported at theannual meeting of symposium and workshop for example how much it is achievedusing some of the indexes such as GDP increase, CO2 reduction, energy saving, water savingamount etc.

The concept introduced here is still under the process of proposaland discussion with some of the universities in Asian countries,however the participation to this strategic project and its collaborative promo-tion must be also one of the beneficial strate-gicmerit especially for the tech-nologyo-riented countries in Asia. Or technology oriented country such as Japan should make a active proposalto ASEAN Economic Commu-nity forjoint collabora-tion.

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