

Report of Agriculture-related Projects Proposed for 2001-2002 Year Cycle

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1. The drafting of new RCA project proposals of nuclear agriculture for the 2001-2002 Cycle

- 1.1 . According to the regional priority identified at the advisory group meeting (AGM) sponsored jointly by IAEA and China Atomic Energy Authorities (CAEA) from 5 to 9 July 1999, Beijing, In consultation with some member states, China had submitted six project proposals to IAEA at mid August 1999. With the arrangement of IAEA, these proposals were sent to the experts in Korea, India, Pakistan, Malaysia, Mongolia, Philippine, Sri Lanka, Thailand and Vietnam for their comments. Up to late September, China received responses from Malaysia, Pakistan, Vietnam and Bangladesh etc. These comments are very valuable for the revision of project proposals.
- 1.2. Mr. Zhang Jing , National RCA coordinator of China and Mr. Zhu Jiang attended the IAEA General Conference at late September 1999. At the conference, India also submitted 11 RCA proposals and Bangladesh submitted 6 proposals. IAEA proposed that all the proposals were also constructive and valuable for the drafting of RCA project proposals. So IAEA assigned China to revise the proposals in regard to the comments on Chinese proposals and the proposals submitted by India and Bangladesh.
- 1.3. On 14 October, China held an expert meeting at the Institute for Application Atomic Energy, CAAS, to discuss the revision of RCA project proposals. At this meeting, four key fields were identified for project drafting according to the available proposals and the regional priority identified at the advisory group meeting in July, 1999. The four fields included the enhancement of genetic diversity, soil fertility and sustainable agriculture, soil degradation and food irradiation. But animal production, water resource and SIT were not approved for project drafting because of limitation of project numbers and lack of regional interests.
- 1.4. China appreciated Indian contribution to the preparation of RCA projects. Their project proposals are valuable for Chinese experts to conduct the proposal revision. Among the 10 Indian proposals, six of which

belonged to mutation breeding, including wheat, groundnut, mungbean, soybean and biochemical and molecular markers. These proposals are generally in consistence with Chinese proposals. Because of the importance of groundnut, mungbean, soybean as minor crops, each crop can not constitute a regional project. So these minor crops are incorporated into the proposal " Enhancement of Genetic Diversity for Improvement of Food, Oil and Pulse Crops through Mutation Techniques Combined with Biotechnology". Meanwhile, according to the similar reasons, two Indian proposals on quality improvement of marine products and detection of irradiated products and one proposal on development of IPNS management are also taken into consideration in the revised proposals.

- 1.5. The six proposals from Bangladesh have provided valuable information about the improvement of groundnut, wheat, mungbean and soil quality, and expressed their great interest to join in the regional projects. These materials are also incorporated into the revised proposals.
- 1.6. Through nearly one-month work, China has completed the revision of project proposals at mid November 1999. When the proposal was revised, four factors were taken into consideration: regional priority and necessity, comments on Chinese proposals, proposals submitted by India and Bangladesh, and financial inputs. In order to facilitate the revision work, the final four project proposals were prepared from the original Chinese proposals. The revised proposals were further e-mailed to other member countries for comments and revisions.
- 1.7. Based on the comments from the member states, China finished the revision of four proposals including enhancement of genetic diversity, soil fertility and sustainable agriculture, soil degradation, and food irradiation. On 23 November 1999, these proposals were sent to Mr. C. R. Aleta, Regional RCA coordinators, for technical evaluation from IAEA experts and officials.
- 1.8. On 28 November 1999, Mr. C.R. Aleta acknowledged the receipt of the revised proposals and demanded the submission of project matrixes for the four proposals. Under the technical guideline of Mr. Zhang Jing, national RCA coordinator of China, and the support of IAEA affairs supporting office, CAEA, Mr. Wang Xunqing drafted four project matrixes and submitted them to Mr. C.R. Aleta on 14 December 1999. Therefore, these project matrixes and the previously submitted project proposals constituted the technical files of RCA project proposals in the area of nuclear agriculture for further discussion.

- 1.9. At the 22nd RCA meeting in the Mumbai, Feb.28 to March 3,2000, Mr. Zheng Kemin, Division director of China Atomic Authority introduced the four proposals in nuclear agriculture, including objectives, activities, outputs and measurable indicators. The participants confirmed China's contribution in the proposal drafting of nuclear agriculture and convinced that these proposals were widely commented and had met the major interests of member states. But some items need to be modified.
- 1.10. On March 7, 2000, Mr. Zheng Kemin had a meeting with Mr. Wang Xunqing, Mr. Ma Zhonghai and discussed the revision of proposals according to the demands at the Mumbai meeting. As demanded in the Mumbai meeting, Chinese experts had organized action plans in priority order, reduced the budget requested from IAEA, incorporated the two proposals in soil section into one proposal, and clarified some technical issues. In collaboration with other experts, Mr. Wang Xunqing completed the revision work of proposal and matrixes.
- 1.11. On march 9, 2000, the three revised proposals: (1) Enhancement of genetic diversity for food, oil and pulse crops and setting up germplasm network (2) Restoration of soil fertility and sustenance of agricultural productivity and (3) Application of food irradiation on food security, safety and trade, were accordingly e-mailed to member states (Bangladesh, India, Pakistan, Malaysia, Mongolia, Philippines, Thailand, Sri Lanka, Vietnam etc.) for comments. Before the deadline March 19, comments from Malaysia, India, Bangladesh and Mongolia were received. They had given some technical comments for further revision and fully supported the proposals
- 1.12. On 22 March 2000, the three revised proposals and their matrixes were sent to Mr. C.R. Aleta, Regional RCA coordinator for evaluation from Agency.
- 1.13. After submission of these proposals, China has kept further contact with Agency on the progress of proposal evaluation. On 3 May, 2000, Mr. C.R. Aleta informed the progress in the preparation of RCA proposals in agriculture, including food irradiation, mutation breeding (germplasm and enhanced diversity in food), soil fertility restoration (combined proposal of soil fertility and soil erosion) and the Production of FMD Antigen and Antibody Elisa reagent kit and the integrated project on animal nutrition, reproduction and disease diagnosis project.
- 1.14. On 22 July 2000, Mr. C.R. Aleta sent a fax to Mr. Zhang Jing, National RCA coordinator of China, inquiring about the use of extrabudgetary

contribution from China. As it was indicated, China had advised Agency to assign the unallocated extrabudgetary contribution of more than US\$ 100,000 to the new agriculture projects under the RCA program. The agriculture-related projects includes (1) Enhancement of genetic diversity for food, oil and pulse crops and setting up germplasm network (2) Restoration of soil fertility and sustenance of agricultural productivity (3) Application of food irradiation on food security, safety and trade, (4) Production of FMD antigen and antibody ELISA reagent kit linked to QC program.

2. Introduction of three new agriculture-related projects proposed for 2000-2001 year cycle

2. 1. Application of food irradiation for food security, safety and trade(RAS/05/042)

2.1.1 Overall objectives:

It aims to improve food security, food safety, and inter-country trade of food products by the application of food irradiation.

2.1.2 Specific objectives:

- ♥ To facilitate the implementation of related regulations of food irradiation in international trade, especially on the irradiation as a phytosanitary treatment
- ♥ To expand the use of food irradiation in member states and to reduce postharvest loss
- ♥ To promote safety of meat and poultry products by irradiation treatment
- ♥ To strengthen the public awareness and acceptance of radiation processing of foods and for phytosanitary treatment.

2.1.3. Project outputs

- © Increased trade of irradiated food commodities in MSs and the region.
- © Exchange/transfer of experience and technology for successful commercial application of food irradiation
- © Increased public awareness of the importance and acceptance of food irradiation among national policy-makers and consumers.
- © Trained personnel, scientists and workers for food irradiation application.

2.1.4 Project activities (duration 3 year)

- ♥ Workshop on project planning and implementation
- ♥ Trade test of irradiation as phytosanitary measures of some selected food items.
- ♥ Training course on use of irradiation to ensure food safety, security and operation food irradiation facility.

- ♥ Technical exchange/visit
- ♥ Expert services

2.2 Restoration of soil fertility and sustenance of agricultural productivity (RAS/05/039)

2.2.1. Overall objectives:

- ♥ Better understanding of soil degradation mechanism: soil erosion, complex pollution, and misuse of agrochemicals.
- ♥ Transfer of better agricultural practices to farmers for restoration of soil fertility on degraded soil: rational cropping practice, biofertilizer, and controlled-released fertilizer.
- ♥ Sustenance of agricultural productivity: Efficient technique package for restoration of soil fertility.

3.2.2. Specific objectives:

- ♥ Increasing fertilizer use efficiency and maintain soil fertility
- ♥ Development of new types of fertilizers
- ♥ Understanding mechanism of soil degradation
- ♥ Assessment of soil erosion and desertification by ^{137}Cs
- ♥ Understanding of the mechanism of soil complex pollution
- ♥ Evaluation of fate of pesticides on soil-crop system
- ♥ Optimize agricultural practices for sustainable soil productivity

3.2.3 Project outputs

- ♥ Establishment of a better technique package for use of organic and chemical fertilizers and its transfer to farmers in area of more than 10,000 hectares, in each participating country.
- ♥ Development 5 to 6 new types of fertilizers such as controlled-released fertilizer, low-cost fertilizers and bio-fertilizers in some participating countries.
- ♥ Establishment of a feasible system for assessment of soil degradation (including soil erosion, soil deterioration) and for identification of spatial distribution of soil quality; identification of key factors causing soil degradation at regional wide scale.
- ♥ Identification of proper agriculture practices for recovering and rebuilding of soil fertility and starting to extend these techniques to farmers.
- ♥ Better understanding of mechanism of soil complex pollution (Heavy metal, pesticides and fertilizers), its effect on soil and crop quality.
- ♥ Evaluation of the environmental fate and behaviour of pesticides and heavy metals and industrial wastes in soil-crop system.
- ♥ Development of effective agricultural practices for increasing crop yield and

improving crop quality and quantity on polluted soil and starting to demonstration.

- ♥ Establishment of a well trained group (10-20 persons) of scientists for studying on soil degradation, assessment of spatial distribution of soil quality and soil fertility monitoring in each participating country;

3.2.4. Project activities (duration 3 year)

- ♥ First meeting of the RCA project to discuss the project plan in details and further activities (**key activity**)

- ♥ Experiments on fertilizers and soil degradation assessment, identification of proper agricultural practices for recovering and rebuilding of soil fertility.

- ♥ Workshop on development and use of new type of fertilizers (**Key Activity**).

- ♥ Training course on use of environmental nuclides and nutrient to assess soil degradation and spatial distribution of soil quality.

- ♥ Final meeting for reviewing the progress of the joint RCA project (**Key Activity**).

- ♥ Workshop on identification of proper agricultural practices for recovering and rebuilding of soil fertility (**Key Activity**).

- ♥ Workshop on development of effective agricultural practices for increasing crop yield and improving crop quality on polluted soils. Each Participating country extends the techniques to farmers.

- ♥ Technical visits and expert mission

2.3 Enhancement of genetic diversity for food, oils and pulse crops and setting up germplasm network (RAS/05/038)

2.3.1. Overall objectives:

- ♥ To improve productivity and quality of Food crops, oil crops (soybean, peanut), pulses (mungbean) through mutation breeding and related techniques in the Region

- ♥ To promote the establishment of a mutant germplasm network (MGN) for materials and information exchange

2.3.2 Specific objectives:

- ♥ To increase crop productivity through improving yield trait, quality traits, biotic and abiotic resistance

- ♥ To generate, collect, identify, utilize and preserve better mutants of seed-propagated crops.

- ♥ To exchange techniques on induction, evaluation and preservation of mutants including new mutagens and biotechnology, etc.

- ♥ To form the regional co-ordination of mutant germplasm network

2.3.3. Project outputs

- ♥ Release and extension of improved varieties with high productivity and good quality and superior disease resistance: 40-50 improved mutants and 12-15 improved varieties.
- ♥ Increase in plantation area of improved varieties and crop grower^s income
- ♥ Material and information exchange and transfer of experiences and techniques in MGN
- ♥ Enhancement in the development of crop improvement by using mutational germplasm and integrated mutation methods.

3.3.4. Project activities (duration 3 years)

- ♥ Two Co-ordinated meetings in project implementation.
- ♥ Working group meeting/ year
- ♥ One training course
- ♥ Three expert services
- ♥ 2-3 fellowship

3. Conclusion remarks

In collaboration with other member states, China has made considerable efforts in the drafting and revision of these RCA proposals that may attract regional attentions. Now there four agriculture-related proposals were recommended for approval at the 29 RCA General Conference.

- (1) Application of food irradiation for food security ,safety, and trade
- (2) Enhancement of genetic diversity for food, oil and pulse crops and setting up germplasm network
- (3) Restoration of soil fertility and sustenance of agricultural productivity
- (4) Production of FMD antigen and antibody ELISA reagent kit linked to QC program,

We fully endorse the above four projects to be considered as agriculture-related projects for the 2001-2002 cycle and expect member states will reach a consensus in this conference. Since soil fertility is one of regional priorities identified at the advisory group meeting in July, 1999, and there is no ongoing RCA project in soil field during the past three years, we propose the soil project (RAS/05/039) be considered as one hardcore project in the 2001-2002 cycle.

Finally I would like to thank all the experts and officials from member states and IAEA for their contribution in the drafting and revision of agriculture-related projects for the 2001-2002 cycle.