# Appendix 2: Full Project Proposal Template (once the EoI is shortlisted)

**(1) Summary page**

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| |  |  | | --- | --- | |  | **Mekong-ROK Cooperation Fund (MKCF)**  **Project Proposal** | | |
| **Project Classification (check all that applies and underline the most key area)** | |
| □ Culture and Tourism  □ Human Resources Development  ◼Agriculture and Rural Development  □ Infrastructure  □ Information and Communication Technology (ICT)  □ Environment  □ Non-traditional Security Challenges | |
| **Project Title** | |
| - Enhance the production of soybean and create innovative technology for processing and utilizing soybeans in Lao PDR and Vietnam | |
| **Brief Description of the Project** | |
| One of the major problems of soybean cultivation in Laos is the lack of market demand for industrial processing of soybeans. This has led to low prices for soybeans, which has made it difficult for farmers to make a profit. There is a high demand for end-use products made from soybeans, such as tofu, soy milk, and soy oil. However, there is not enough processing capacity in Laos to meet this demand. This has led to a situation where there is a surplus of soybeans, but the prices are low. Another problem with soybean cultivation in Laos is the low yields. Yields in Laos range from 0.6 to 2 t/ha, which is much lower than yields in other countries. This is due to a number of factors, including the use of traditional farming practices, lack of access to improved seeds and fertilizers, and pests and diseases. Vietnam is also a major importer of soybeans, with an estimated import volume of 4.5 million metric tons in 2020. The country relies heavily on imports to meet the growing demand for soybeans from the animal feed industry, as well as for use in food processing and the production of soybean oil.  The project will also focus on developing new variety and innovative soybean-base products that can be marketed both domestically and internationally. This will not only increase the demand for soybean but also create new business opportunities for local famers and small-scale enterprises. By diversifying the use of soybean, the project will help to reduce the reliance on traditional soybean production and create more sustainable and resilient soybean industry in these countries.  Additionally, the project will work closely with local governments and other stakeholders to facilitate the adoption of new variety, technologies and best practices in soybean production and processing, which will improve the overall efficiency and productivity of the sector. This will ultimately lead to greater economic growth and development, as well as improved food security and nutrition for local communities.  The exchange of technology and resources, coupled with the training programs and master course, will help to create a more sustainable and efficient soybean sector. The stakeholders involved in this collaboration will be better equipped to produce high-quality soybean, will not only boost their incomes but also contribute to overall economic growth of the region.  The project output   * Introducing new varieties and production technologies can increase farmer productivity by 1 ton/hectare (from the current 1.5 t/ha to 2.5 t/ha). Additionally, increased yield and processing of soybean products can generate a sustainable income increase of over $300/ha for smallholder farmers compared to their current soybean income. * Four farmer field school (FFS) (2 for Lao and 2 for Vietnam) on soybean production and processing will be developed which adapted new technology on soybean production and processing. * Increase knowledge and awareness of farmers and consumers on the important of soybean consumption, production and processing. * Soybean producer access to market through cooperation with local and Korean food processing sector. * Young scientists have been improved their knowledge and skill on soybean production and food processing technology. 8 researchers (4 from NAFRI and 4 from AGI will be trained on-job training in Korea). * A total of 240 Lao and Vietnamese farmers, 20 local agricultural officers, and 20 internship students from Laos and Vietnam will be trained on soybean breeding, production and processing technology, and implementing the FFS. * **A total of 240 FFS members from 16 FFS (8 from Laos and 8 from Vietnam) involved in the project will improve their productivity and livelihood income. Additionally, around 120 to 300 participants per country will benefit by attending training, workshops, seminars, seed and food fairs, etc. These benefits will extend to farmers from the villages where the FFS are implemented, as well as to an estimated 1,000 nearby households, through access to seeds, handbooks, and field days**. | |
| **Country / Region** | |
| LAOS/Vietnam | |
| **Budget** | |
| Total budget (USD): 435,136 USD  Total budget requested from MKCF (USD): 435,136  Total contribution if any including from third parties (USD): | |
| **Proponent** | |
| Name | Siviengkhek Phommalath |
| Address | National Agriculture and Forestry Research Institute |
| **Date of Submission** | 8/8/2023 |

**(2) Full Proposal Format**

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|  | **Mekong-ROK Cooperation Fund (MKCF)**  **Project Proposal** | | | | |
| **Project Information** | | | | | |
| 1.1. Project Title | Enhance the production of soybean and create innovative technology for processing and utilizing soybeans in Lao PDR and Vietnam | | | | |
| 1.2. Country(s)/Region | Laos | | | | |
| 1.3. Date of Submission | 4/8/2023 | | | | |
| 1.4. Proponent Contact Details | | | | | |
| Contact person, position  Organization  Email address  Telephone number  Mailing address | Siviengkhek Phommalath Ph.D, Deputy Director of RCRC Plant Breeder.  Ministry of Agriculture and Forestry, National of Agriculture and Forestry Research Institute Rice and Cash Crop Research Center.  Siviengkhek@yahoo.com  +856-20-9965-3959  N.A | | | | |
| 1.5. Project Area (check all that applies and underline the most key area) | | | | | |
| □ Culture and Tourism  □ Human Resources Development  ◼Agriculture and Rural Development  □ Infrastructure  □ Information and Communication Technology (ICT)  □ Environment  □ Non-traditional Security Challenges | | | | | |
| **Project Milestone** | | | | | |
| Estimated implementation start date  Estimated implementation end date  Project duration | | 01/01/2024  31/12/2026  3year(s) (2024 to 2026)36 month(s) | | | |
| **Description of Financial Elements** | | | | | |
| Project cost (USD) | Contribution (USD) if any | Total Project Cost (USD) | | | |
| 435,136 USD |  | 435,136 USD | | | |
| **General description of organization (***approx. 500 words***)** | | | | | |
| 1.9. General Description of Organization  **National agriculture and Forestry Research Institute (NAFRI):** Under Ministry of Agriculture and Forestry (MAF) Lao PDR, NAFRI was established in 1999 in order to consolidate agriculture and forestry research activities within the country and develop a coordinated National Agriculture and Forestry Research System. NAFRI is mandated to undertake integrated agriculture, forestry and fisheries research in order to provide technical information, norms and results which help to formulate strategy in accordance with the government policies. NAFRI has four main functions including: [1] carrying out adaptive research, [2] developing methods, tools and information packages, [3] providing policy feedback, and [4] coordinating and managing research.  NAFRI has six programs such as: 1) Sustainable agro-biodiversity, 2) Improve agricultural productivity, 3) Agriculture adaptation to climate change, 4) Agriculture and forestry policy research, 5) Capacity building and 6) Information and communication. NAFRI has developed soybean program since 2010 and released one soybean variety (Naphok 1) in 2022.  **Agricultural Genetics Institute (AGI)** was established in 1984 (on the base of Department for Genetics, directly under the National Center of Natural Science and Technology) and its organization was rearranged on 9th September 2005 by the Decision No. 220/2005/QD-TTg of the Prime Minister. AGI is the national institute, directly under the Vietnam Academy of Agricultural Sciences (VAAS), commissioned to carry out research and application on agricultural biotechnology, mutation breeding, conventional breeding and technology transfer.  Task: (1) To build up the strategies, projects, planning of scientific research and technology transfer in the field of genetics and biotechnology in long term period, 5 year period or yearly for the purpose of socio – economic development, to propose to competent authorities and implementing organization; (2) To implement scientific research & technology transfer in the fields of: a) Variation & Genetic rule at the level of molecule, cell, individuals, population on crops and micro-organisms; b) Application of Nano & recombinant DNA technologies to analyze plant genome; c) Application of genetic & Biotechnology methods to diversify genetic resources, to create primary materials for selecting and breeding of crops and micro-organism; d) Development & application of Bioinformatics to build up genomic database of crops and micro-organism as: gene map, gene sequence, gene function, genetically modified crops, genetically modified products; e) Application of technology solution to protect agricultural biology environment, biological diversification and biotechnology; (3) Implementation of task of technology transfer, agricultural encouragement in genetic and biotechnology fields; (4) International cooperation on scientific research, technology transfer, expert cooperation, human resource training in genetic & agricultural biotechnology fields with foreign organizations and individuals according to Vietnam Government’s regulations; (5) Link & cooperation of scientific research and technology development, new techniques test, human resource training in assigned fields with local organizations; (6) Production & business pursuant; (7) Effective management and using of assigned human resources, budget, assets pursuant to law.  Applying conventional breeding methods combined with modern biotechnology breeding and developing new varieties with high yield and good quality, resistance to biotic and abiotic stress. A number of varieties have been released and deployed on large scale throughout the country such as rice, soybean, cassava, mushroom, mayze. With soybean varieties, the AGI has created and transferred 13 soybean varieties as DT84, DT96, DT2001, DT02 into production. Among of these, typically DT84 and DT96 varieties, were tranfered into production in '90s of the last century, but no surpassed other yet up to now. Currently, the soybean varieties were created by the AGI occupied an area approximately 58% of total country and 80-90% of the North.  **Kyungpook National University (KNU):** The College of Agriculture and Life Science (CALS) at Kyungpook National University (KNU) was originally Daegu College of Agriculture when it was established in 1944. In the 80 years since it opened its doors, it has contributed to the development of Korea’s agroindustry by producing about 20,000 agricultural experts, including the Minister and Vice Minister of Agriculture and Forestry, presidents and professors at universities including KNU, Nobel Prize candidates, public officers from agroindustry, and representatives from agro-industrial firms.  More than 2,000 students, including 126 international students from 26 countries, along with 86 professors, are currently devoting themselves in teaching and learning to become experts in agriculture and create high value in industrial agriculture. KNU has developed the College into the major center for education and research related to Agri-Food and Life Sciences. Department of Applied Biosciences (DAB) and School of Food Science (SFS) are one of top Department in KNU. We are running education program named BK21 for graduated school which funded by Ministry of Education of Korea. DAB and SFS has 35 professors in various research fields including soybean genetics and breeding, molecular biology, plant physiology, soybean production technology, microbiology for nitrogen fixation, food microbiology and biotechnology, food science and technology. Two professors in DAB are running start-up companies with value added variety development and healthy soy food business, and effective microorganism (EM) fertilizer and EM agro-chemicals. DAB also run a master degree program funded by KOICA (2014~2027) for oversea students. Therefore, we have enough human resources, education system, and value chain experiences to support this program | | | | | |
| **Project background and justification** *(approx. 500 words)* | | | | | |
| Soybean production in Laos is relatively small, with an estimated output of 6,000 metric tons in 2020. The majority of soybeans produced in Laos are consumed domestically, primarily as a source of protein in traditional dishes such as Kaosoy and Tuanao. However, due to limited production capacity and low yields, Laos relies heavily on imports to meet domestic demand for soybeans. In 2020, Laos imported approximately 95,000 metric tons of soybeans, primarily from neighboring countries such as Thailand and Vietnam. Soybean processing in Laos is relatively small, with only a few processing plants operating in the country and there is limited processing capacity for soybean oil and other soy-based products. However, there is potential for the development of the soybean processing industry in Laos, as the country has a favorable climate for soybean cultivation and is strategically located between major soybean producers and consumers in Southeast Asia.  Vietnam is one of the largest producers and consumers of soybeans in Southeast Asia, with an estimated production of 1.6 million metric tons in 2020. The majority of soybeans produced in Vietnam are used for animal feed, with only a small portion consumed directly by humans. Vietnam is also a major importer of soybeans, with an estimated import volume of 4.5 million metric tons in 2020. The country relies heavily on imports to meet the growing demand for soybeans from the animal feed industry, as well as for use in food processing and the production of soybean oil. Vietnam has a well-developed soybean processing industry, with a large number of processing plants located throughout the country. The processing industry in Vietnam is dominated by a few large companies, and the industry has undergone significant consolidation in recent years. Soybean processing in Vietnam includes the production of soybean oil, soybean meal, and other soy-based products such as tofu and soy milk.  The Republic of Korea is a significant importer of soybeans, with an estimated import volume of 1.8 million metric tons in 2020. The majority of soybeans imported by the Republic of Korea are used for animal feed, with a growing demand for soybean oil and other soy-based products.  There are several opportunities for linkages between Laos, Vietnam, and the Republic of Korea in the soybean industry. One potential area of collaboration is in the development of soybean production in Laos, with support from the Republic of Korea and Vietnam in terms of technology transfer and investment. Additionally, there is potential for the Republic of Korea and Vietnam to import soybeans from Laos, which could help to diversify their sources of supply  Another area of potential collaboration is in the development of the soybean processing industry in Vietnam and the Republic of Korea, with support from Laos in terms of raw material supply. This could help to increase the value-added of soybeans produced in Laos and provide new opportunities for the country's agricultural sector. Additionally, all three countries could work together to promote the use of soy-based products in the food industry, which could help drive demand for soybeans and create new market opportunities for farmers and businesses. | | | | | |
| **Problems (to be addressed)** *(approx. 300 words)* | | | | | |
| One of the major problems of soybean cultivation in Laos is the lack of market demand for industrial processing of soybeans. This has led to low prices for soybeans, which has made it difficult for farmers to make a profit. There is a high demand for end-use products made from soybeans, such as tofu, soy milk, and soy oil. However, there is not enough processing capacity in Laos to meet this demand. This has led to a situation where there is a surplus of soybeans, but the prices are low.  Another problem with soybean cultivation in Laos is the low yields. Yields in Laos range from 0.6 to 2 t/ha, which is much lower than yields in other countries. This is due to a number of factors, including the use of traditional farming practices, lack of access to improved seeds and fertilizers, and pests and diseases.  Most soybean producers in Laos use traditional farming practices, which have low yields. These practices include simple fertilizer application, weed and pest control, and post-harvest management. There is a need for farmers to adopt more modern farming practices in order to improve yields.  The project will also focus on developing new variety and innovative soybean-base products that can be marketed both domestically and internationally. This will not only increase the demand for soybean but also create new business opportunities for local famers and small-scale enterprises. By diversifying the use of soybean, the project will help to reduce the reliance on traditional soybean production and create more sustainable and resilient soybean industry in these countries.  Additionally, the project will work closely with local governments and other stakeholders to facilitate the adoption of new variety, technologies and best practices in soybean production and processing, which will improve the overall efficiency and productivity of the sector. This will ultimately lead to greater economic growth and development, as well as improved food security and nutrition for local communities.  The exchange of technology and resources, coupled with the training programs and master course, will help to create a more sustainable and efficient soybean sector. The stakeholders involved in this collaboration will be better equipped to produce high-quality soybean, will not only boost their incomes but also contribute to overall economic growth of the region. | | | | | |
| **Project Objective (***approx. 500 words)* | | | | | |
| Goal of project to enhance public awareness of soybean consumption and strengthening farmer capacity building on soybean production, utilization and value chain development.  **Objective**  1. Find out the necessary core technology to increase soybean productivity.  2. Raising awareness and capacity building on the nutrition-sensitive, benefits of soybean consumption, production and processing through training, workshop and attending farmer field school (FFS).  3. **Boosting Lao and Vietnamese soybean value addition through Korean models**.  **Output**   * Introducing new soybean varieties and production technologies can increase farmer productivity by 1 ton/hectare (from the current 1.5 t/ha to 2.5 t/ha). Additionally, increased yield and processing of soybean products can generate a sustainable income increase of over $300/ha for smallholder farmers compared to their current soybean income. * Foure farmer field school (FFS) (Two for Lao and two for Vietnam) on soybean production and processing will be developed which adapted new variety and technology on soybean production and processing. * Increase knowledge and awareness of farmers and consumers on the important of soybean consumption, production and processing (direct benefit 120 participants per country by attending the training, workshop, seminar, seed and food fair etc). * Soybean producer access to market through cooperation with local and Korean food processing sector. * Young scientists have been improved their knowledge and skill on soybean production and food processing technology. 8 researchers (4 from NAFRI and 4 from AGI will be trained on-job training in Korea). * A total of 240 Lao and Vietnamese farmers, 20 local agricultural officers, and 20 internship students from Laos and Vietnam will be trained on soybean breeding, production and processing technology, and implementing the FFS. * **A total of 240 FFS members from 16 FFS (8 from Laos and 8 from Vietnam) involved in the project will improve their productivity and livelihood income. Additionally, around 120 to 300 participants per country will benefit by attending training, workshops, seminars, seed and food fairs, etc. These benefits will extend to farmers from the villages where the FFS are implemented, as well as to an estimated 1,000 nearby households, through access to seeds, handbooks, and field days** | | | | | |
| **Project Description (***approx. 500 words)* | | | | | |
| **Objective 1: Find out the necessary core technology to increase soybean productivity.**   * 1. Develop breeding program by cooperate technology among member team (NAFRI, AGI and KNU):   - Germplasm and breeding materials exchange and evaluate the population in each country, identify the best adaptation lines/variety then register for commercial in each country  - Develop breeding program among member team: The new soybean varieties with high yield, rich nutrient content and good adaptation in wide environment (Yield > 2,5t/ha and protein content > 40% and oil content > 20%)   * 1. Improved soybean productivity through better soil, water, weed and pest management practices: The best management practice will identify optimum dose of fertilizer (chemical and compost), irrigation system, weed management (introduce weeding machine), pest management (introduce smart trap from RDA and apply IPM) and post-harvest technology. The result will transfer to demonstrate in farmer field school by comparing with farmer practice (control).   2. Farmer field school (FFS) on the best management practice for soybean production, it will be conducted at farmer’s field in 1 province of Lao and 1 provinces of Vietnam. Will invite farmer in the village who are interested on soybean production will join FFS, estimate 15 members per village (one village = one FFS). Will develop curriculum of FFS, which will cover: comparing best management practice (good variety, soil improvement, pest control, weed control and post-harvest practice) with farmer practice. * **FFS** will be done in 800 to 1,000m2 (plot size 10\*20 m one for control and other one for best practice). All member will be trained by trainer, local partner and head of FFS will be main person to manage the FFS activities. Farmer field day will be conducted in the end of season. The report of FFS activities will cover result of demonstration plot, FFS assessment and recommendation for future activities.   **Objective 2: Raising awareness and capacity building on the nutrition-sensitive, benefits of soybean consumption, production and processing through training, workshop and attending farmer field school (FFS)**   * 1. Young scientist of NAFRI and AGI will be trained short term 8 researchers (4 from NAFRI and 4 from AGI will be trained on-job training for 15 days in KNU Korea) on soybean breeding, production, post-harvest and food processing and biotechnology. Scientific visit among NAFRI, AGI and KNU.   2. Conducted national training for developing trainers and facilitator on soybean production and processing at NAFRI and AGI. Local researcher and agriculture officer, leader of FFS (farmer) and internship student will be trained on facilitate FFS and technology of soybean production and processing.   3. Develop education materials on the important and benefit of soybean consumption, production and processing. Guidebook will be developed in 3 topics: 1) The nutrition-sensitive, the important and benefit of soybean consumption, 2) The best management practice on soybean production, and 3) Soybean processing technology. All material will be done in 3 languages (Lao, Vietnam and English). Video on processing product will be developed (1 video for 1 product estimate around 3 product base on budget allocate)   **Objective 3: Boosting Lao and Vietnamese soybean value addition through Korean models**   * 1. Conduct experiment on soybean processing to develop soybean products: (high protein soy-milk, care-foods based on soybean, rice and vegetables, soybean oil and soybean snack will be priority product) at least 5 products will be developed (2 for Lao and 3 for Vietnam)   2. FFS will implement novel and optimized food techniques and technologies on developing healthy and customized soybean-based products for commercialization as apilot model in 2 FFS (1 in Lao and 1 in Vietnam). | | | | | |
| **Regional nature of the project** *(with the maximum length of approx. 300 words)* | | | | | |
| *Describe how the problem or issue affects more than one Mekong country and requires regional actions and how it will be addressed in the project.*  In Laos and Vietnam, soybean is a traditional crop, has economic value, is an important source of nutrition for humans, is highly effective in rotation with other crops, helps improve soil, and reduces pests and diseases. Addtionaly, Laos and Vietnam are able to grow soybean twice a year at leat. However, soybean yields are low due to lack of new varieties, outdated farming techniques and climate change. Therefore, the selection and breeding of new soybean varieties with high yield, high quality, good resistance to pests and diseases and difficult ecological conditions will help develop sustainable soybean production, improve income and life of farmers in Laos and Vietnam.  The project will use the research results on varieties and cultivation techniques of the members for use in other countries, which will shorten the research and development time for soybean production.  The project will exchange new soybean genetic resources to meet the research needs of countries. In particular, there will be genetic resources that have been identified as promising for production to be comprehensively evaluated in the Member States (Mekong country).  The project will help strengthen cooperation between member countries, between scientists, cooperatives, companies and farmers to develop sustainable soybean production.  *Explain how the project promotes cooperation between the Mekong countries and the ROK to address the identified regional issue(s).*  Korea will participate in the orientation of research goals and implementation plans for the project member countries.  Korea will share experience, breeding techniques and new soybean production techniques with participating countries.  Korea will provide soybean genetic resources with valuable characteristics such as high yield, good quality, disease tolerance, etc. to the participating countries to use as materials for the selection of new varieties.  Korea will provide techniquics for development of soybean foods (high protein soy-milk, soy based care foods, extraction soybean oil) and lead to apply the 6th Agri-Food Industry in two countries  In addition to the family, Korea will participate in training for researchers of member countries. | | | | | |
| **Partnership with organisation (s) in Mekong countries and RoK (***approx. 300 words*) | | | | | |
| **Siviengkhek Phommalath, Project Investigator (PI) from Laos, has a strong relationship with KNU.** He graduated with a master's degree from KNU in 2008 and has maintained a close working relationship with his supervisor and other professors there ever since. He was the PI of the AFACI (Asian Food and Agriculture Cooperation Initiative) project from 2016 to 2018, titled "Demonstration Project to Distribute National Superior Seeds of Food, Crops, and Transfer Agricultural Technology." He was also the PI of the KOPIA (KOrea Partnership for Innovation of Agriculture) project from 2018 to 2023, titled "Enhancing on legume productivity and the capacity building on breeding program for improving food and nutrition security in Lao PDR." Both projects were funded by the RDA (Rural Development Administration).  The National Agriculture and Forestry Research Institute (NAFRI) and the Asian Genotyping Institute (AGI) have collaborated on human resource development since 2017. AGI has hosted NAFRI researchers to train them in mutation breeding for rice and legumes. The two institutes have also begun to develop joint research programs on rice, maize, and legumes.   * Human resource development: AGI has hosted NAFRI researchers for training in mutation breeding for rice and legumes. This training has helped NAFRI researchers to develop the skills they need to conduct mutation breeding research. * Joint research programs: NAFRI and AGI have begun to develop joint research programs on rice, maize, and legumes. These research programs will focus on developing new varieties of these crops that are resistant to pests and diseases, have higher yields, and are better suited to the growing conditions in Laos.   The collaboration between NAFRI and AGI is a valuable one. It is helping to build the capacity of NAFRI researchers in mutation breeding and is leading to the development of new varieties of crops that will benefit farmers in Laos.  We conducted co-project funded by Ministry of Education during 2015. 12-2016.11.  - Project name: National Research Foundation Korea-ASEAN Science and Technology project  - Project title: Evaluation and selection soybean germplasm to use variety development for increasing production in Vietnam, Laos, and Korea  - Counter partner: Vietnam and Laos  - Type: Co-research and co-seminar  - PIs from each country: Lee, Jeong-Dong (Korea), Le Duc Thao (Vietnam), Siviengkhek Phommalth (Laos)  - Achievements:  (1) Workshop for germplasm analysis, mapping for agromic traits and genome wide association study (2016.02.16-02. 25, Kyungpook National University)  (2) International seminar for strategies of germplasm utilization for improvement of soybean yield in Korea, Vietnam and Lao PDR (2016.8.3, Kyungpook National University)  (3) Publication: Hyun Jo, Minsu Kim, Liakat Ali, Rupesh Tayade, Danim Jo, **Duc Thao Le, Siviengkhek Phommalth**, Bo-Keun Ha, Sungtaeg Kang, Jong Tae Song and **Jeong-Dong Lee**. 2020. Environmental Stability of Elevated α-Linolenic Acid Derived from a Wild Soybean in Three Asian Countries. Agriculture 10, 70; doi:10.3390/agriculture10030070 | | | | | |
| **Target beneficiaries and Project Coverage** (*approx. 300 words)* | | | | | |
| * **A total of 240 FFS members from 16 FFS (8 from Laos and 8 from Vietnam) involved in the project will improve their productivity and livelihood income. Additionally, around 120 to 300 participants per country will benefit by attending training, workshops, seminars, seed and food fairs, etc. These benefits will extend to farmers from the villages where the FFS are implemented, as well as to an estimated 1,000 nearby households, through access to seeds, handbooks, and field days** * Young scientists have been improved their knowledge and skill on soybean production and food processing technology. 8 researchers (4 from NAFRI and 4 from AGI will be trained on-job training in Korea). * A total of 240 Lao and Vietnamese farmers, 20 local agricultural officers, and 20 internship students from Laos and Vietnam will be trained on soybean breeding, production and processing technology, and implementing the FFS. | | | | | |
| **Value Add for the MKCF Involvement/ Potential (***approx. 300 words)* | | | | | |
| The outcome of the project will be contributed to the achievement of the first priority action plan of the Agricultural Development Strategy to 2025 and Vision to 2030 and including the achievement of the Sustainable Development Goals (SDGs) by 2030. New improve varieties, the best management practice and processing product of soybean will be developed in each country, which will improve small scale farmers in food security and sustainable income. Direct benefit from project 120 HHs (household) per country (total 240 members with 120 of women and 48 of youth and indirect 1,000 people.  High protein soy-milk and soy based care food will improve malnutrition of minority such as children and women. | | | | | |
| **Project Sustainability** *(approx.300 words)* | | | | | |
| *Explain how the project sustainability will be ensured in the long run, after the project is implemented with support from the MKCF*  *The PIs in each side will get responsibilities to get maximum achievements from this project as below*  **Dr Siviengkhek Phommalath**  project manager:   * Project developer * Coordinate between donor (MKCF) and country member (Vietnam and Korea)*,* * Submit activities and financial report to MKCF * Manage activities in Laos and link to partner in Vietnam and Korea * Organize relate meeting among member country (online and face to face meeting)   **Dr Le Duc Thao**  Country project coordinator and manager   * Co- project developer and technical supervisor * Manage activities in Vietnam and link to other partner in Laos and Korea * Submit activities and financial report to Laos   Dr Jeong-Dong Lee  Country project coordinator and manager   * Co-project developer and technical supervisor * Manage activities in Korea and link to other partner in Laos and Vietnam * Submit activities and financial report to Laos   *At the regional level:* The exchange meetings between countries will review the situation of soybean research and production in the region as well as in the world. Countries will discuss and identify difficulties and challenges, thereby determining goals and solutions for soybean development in the region.  Short-term and long-term training courses on soybean breeding, production, and food processing and mangement will be organized to help improve the research capacity of member countries, contributing to the development of soybean production in each country.  The countries that will conduct the exchange of genetic resources will be an important starting material in each country's breeding program.  In addition, the fact that Korean scientists will transfer new research results to the participating countries will help countries in the region improve the level of breeding technology and soybean production techniques.  *At the national level:* To ensure the sustainability of the project, during project implementation, all activities are closely coordinated with local partners such as cooperatives, extension departments and staff, facilitating the transfer of seed technologies and production techniques and ensuring that they can be monitored for sustainable use even after the extension funds are used up by the local government.  Training classes were held at all models to introduce the benefits of using soybean varieties and new production techniques, first of all for their own benefit to save production costs and improve their living standards locally. The cultivated knowledge of the farmers will help them make the right decisions in the production of soybeans or other crops.  The linkage model between production, consumption and processing will be organized, ensuring output for farmers, will help improve their living standards, and at the same time ensure the sustainability of soybean production in each country. | | | | | |
| **Management Arrangements** *(approx. 500 words)* | | | | | |
| *Describe the project management structure of the project, coordination mechanism with the Mekong country partners, relevant stakeholders, MKCF secretariat and MoFA.*  Laos as the project host country will be responsible for coordinating the project activities and reporting the progress and results of the project implementation to the MKCF and MoFA secretariat and stakeholders. Vietnam and Korea are participating countries, responsible for reporting to Laos on the results of implementation in each member country. As follows:  **Laos:**  - Presiding over the development of proposals, building plans to organize activities of the project.  - Organize relevant meetings between project members and stakeholders on the progress, content and results of the project.  - Presiding over the organization of soybean genetic resources exchange activities between member countries, short-term training courses, seed and model tours in member countries.  - Implement national content as required by the project on breeding, production techniques, building models, training farmers...  - Lead the writing of project reports.  **Vietnam:**  - Coordinating the development of proposals, plans to organize activities of the project.  - Participate in relevant meetings between project members and stakeholders about the progress, content and results of the project.  - Send members to participate in short-term and long-term training courses of the project, prepare soybean genetic resources as required for exchange.  - Implement national content as required by the project on breeding, production techniques, building models, training farmers...  - Participate in project report writing.  **Korea:**  - Coordinating the development of proposals, plans to organize activities of the project.  - Participate in relevant meetings between project members and stakeholders about the progress, content and results of the project.  - Organizing short-term and long-term training activities for the project, providing soybean genetic resources for member countries.  - Carry out researches on breeding and production techniques of soybean.  - Provide model of the 6th Agri-Food Industry, lead to development of high protein soy-milk, soy based care foods and soybean oil  - Participate in project report writing.  *Describe briefly the implementation arrangement of joint activities with the partner organisations (s) in the Mekong countries and or RoK*  During project implementation, many joint activities of member countries will be organized. Specifically:  - Meetings to assess the status of soybean breeding research and production techniques in the world and in the region, and to share research results of member countries. From there, the objectives, research orientations and project implementation plans are determined in the member countries.  - Exchange of soybean genetic resources for research among member countries.  - Organize short-term and long-term training courses with the participation of project members.  - Organize meetings, visit models and implementation results in member countries to evaluate project implementation results.  *Describe briefly the human resource inputs i.e. full-time project staff, part time staff, Experts and consultant’s bio and roles and responsibilities (refer to ToR and CV format at appendix 5 and 6)*  The project has the participation of prestigious scientists in member countries. These are scientists with the following qualifications in the field of soybean breeding and production techniques. In addition, they are also experienced in transferring new advances in varieties and farming techniques to farmers, building demonstration models, organizing production linkages between farmers, cooperatives and companies... | | | | | |
| **Outcomes, Outputs, Activities and Inputs at Project level** | | | | | |
| Expected Result | Indicator | Means of Verification | Target | | Remarks |
| Mid-term | Final |
| Project outcomes | | | | | |
| The project is to boost public awareness of soybean consumption while simultaneously empowering farmers to enhance their capacity in soybean production, utilization and value chain development. This initiative is geared towards achieving political goals by promoting the growth of the soybean industry and its positive impact on the economy and society as whole. | The outcome of the project will be contributed to the achievement of the first priority action plan of the Agricultural Development Strategy to 2025 and Vision to 2030 and including the achievement of the Sustainable Development Goals (SDGs) by 2030. | Report from the implementing province, Report of Ministry of Agriculture and Forestry |  | |  |
| By leverage built-in capacities, we can develop the best management practice to increase soybean productivity, create climate-resilient soybean varieties, and boost nutrient content for improved food and nutrition security. Additionally, we can enhance sustainable income for farmers through soybean processing products | New improve variety, the best management practice and processing product of soybean will be developed in each country, which will improve smallholder farmers in food security and sustainable income. Direct benefit from project 240 HHs (household) for 3 countries with 120 of women and 48 of youth and indirect 1,000 people. |  |  | |  |
| Project outputs (that contribute to outcomes) | | | | | |
| 1.Objective 1*:* Find out the necessary core technology to increase soybean productivity | * Exchange breeding material among 3 institute (NAFRI, AGI and KNU) at least 200 lines. * Release new soybean variety total 3 varieties (1 variety for Laos and 2 for Vietnam) with higher yield (>2 t/ha for Lao and > 2,5t/ha for Vietnam) and protein content > 40% and Oil content > 20). * The best management practice for soybean production will increase yield 1t/ha * 8 farmer field schools for each country (total 16 FFS for Lao and Vietnam) * 120 members (60 of female and 24 of youth) each country (total 240 member) | -Project interim report Publish  In NAFRI/  AGI/KNU Journal and website  - Research experiment reports  Guidebook, leaflet Project  interim report  NAFRI/AGI/  KNU Journal and website  - Project interim reports |  | |  |
| 2. Objective 2: Raising awareness and capacity building on the nutrition-sensitive, benefits of soybean consumption, production and processing through training, workshop and attending farmer field school (FFS)) | * 8 researchers from NAFRI and AGI will be on-job training in Korea for 15 days (4 for production and 4 for processing) * A total 240 farmers, 20 local agricultural officer and 20 internship students from Lao and Vietnam will be trained on soybean breeding, production and processing technology and implanting the FFS * Guidebook will be printed 500 copies per topic per country (total 3,000 copies for Lao and Vietnam) | -Report of training  Certificate of Master graduation from KNU  - Project interim reports  -Guidebook, leaflet and Project interim reports.  -Upload to difference social media(You  Tube, FB, Tik Tok etc) |  | |  |
| 3. Objective 3: **Boosting Lao and Vietnamese soybean value addition through Korean models** | - 5 soybean-based products will be developed (2 from Lao and 3 from Vietnam)  - 2 FFS will be a pilot model in soybean-based products for commercialization (1 for Lao and 1 for Vietnam) | -Research experiment reports Guidebook,  leaflet and Project interim reports  - Project interim reports Case studies  - Seed fair event report |  | |  |
| Activities | Description | | | | |
| 1.1. | Develop breeding program by cooperate technology among member team (NAFRI, AGI and KNU) | | | | |
| 1.2. | Improved soybean productivity through better soil, water, weed and pest management practices: | | | | |
| 1.3 | Farmer field school (FFS) on the best management practice for soybean production and processing. | | | | |
| 2.1. | Young scientist of NAFRI and AGI will be trained short term on soybean breeding, production, post-harvest and food processing in Korea (benchmarking food industry in Korea, development of soy-bean based products, application of novel food technique for enhancing safety and value, development of formula and process, preparation of HACCP model and guideline). | | | | |
| 2.2. | Scientific visit among NAFRI, AGI and KNU (change country to be host). | | | | |
| 2.3. | Conducted national training for developing trainers and facilitator on soybean production and processing at NAFRI and AGI. Local researcher and agriculture officer, leader of FFS (farmer) and internship student will be trained on facilitate FFS and technology of soybean production and processing. | | | | |
| 2.4. | Develop education materials on the important and benefit of soybean consumption, production and processing. Guidebook will be developed in 3 topics: 1) The nutrition-sensitive, the important and benefit of soybean consumption, 2) The best management practice on soybean production, and 3) Soybean processing technology. | | | | |
|  | Conduct experiment on soybean processing to develop soybean products: (high protein soy-milk, care-foods based on local soybean, rice and vegetables, soybean oil and soybean snack will be priority product) | | | | |
|  | FFS will implement novel and optimized food techniques and technologies on developing healthy and customized soybean-based products for commercialization as apilot model in 2 FFS (1 for Lao and 1 for Vietnam). | | | | |

**Monitoring and Evaluation (M&E) Framework**

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| **HIERARCHY OF RESULTS** | **RESULT STATEMENT(S)** | **OBJECTIVELY VERIFIABLE INDICATORS (OVIs)** | **DEFINITION** | **BASELINE** | **TARGET** | **DATA SOURCE / MEANS OF VERIFICATION** | **FREQUENCY** | **RESPONSIBLE** | **REPORTING** |
| How is it calculated? | What is the current value? | What is the target value? | How will it be measured? | How often will it be measured? | Who will measure it? | Where will it be reported? |
| **Impacts** | The outcome of the project will be contributed to the achievement of the first priority action plan of the Agricultural Development Strategy to 2025 and Vision to 2030 and including the achievement of the Sustainable Development Goals (SDGs) by 2030. | | | | |  |  |  |  |
| **Outcomes** | New improve variety, the best management practice and processing product of soybean will be developed in each country, which will improve smallholder farmers in food security and sustainable income. | Smallholder farmer increase yield 1 t/ha | Comparing yield before and after project | Yield 1 t/ha (Lao) and 1,5 t/ha (Vietnam) | Yield > 2t/ha (Lao)   Yield > 2,5t/ha (Vietname) | Final report  Release certificate | End of project | PI | Project interim report, Publish in NAFRI/AGI/KNU Journal and website |
|  | Smallholder farmer get sustainable income | Better yield of soybean and processing product (soybean base product) | NA | Will increase 300$/ha of current income from Soybean | Finnal report | End of project | PI | Project interim report, Publish in NAFRI/AGI/KNU Journal and website |
| **Outputs** | Objective 1*:* Find out the necessary core technology to increase soybean productivity | 3 varieties will be released in each country | Number of release new variety | 1 in Laos, …Vietnam and Korea | 1 varieties for Laos and 2 for Vietnam | Approve letter from authorize organization/ Final report | End of project | PI | Project interim report, Publish in NAFRI/AGI/KNU Journal and website |
| Introduce the best management practice (BMP) for soybean production | Technical guiden | Farmer practice | New practice (BMP) | Result from FFS implementing | End of year | PI | Project interim report, Publish in NAFRI/AGI/KNU Journal and website |
|  | 240 members of FFS (120 of female and 48 of youth) | Number of participant | Farmer practice | 180 of member adopted new variety and practice | Result from FFS implementing | End of year | PI | Project interim report, Publish in NAFRI/AGI/KNU website |
| Objective 2: Raising awareness and capacity building on the nutrition-sensitive, benefits of soybean consumption, production and processing through training, workshop and attending farmer field school (FFS)) | 8 researchers on-job training in Korea | Number of participant | 0 | 4 from Lao and 4 from Vietnam | Register of participant and final report and Certificate | End of project | PI | Project interim report, Publish in NAFRI/AGI/KNU Journal and website |
|  | Around 240 farmers, 20 local agricultural officer and 20 internship students will be trained on soybean breeding, production and processing technology and implanting the FFS | Number of participant | 0 | 240 farmers, 20 local agricultural officer and 20 for Lao and Vietnam | Register of participant and final report and Certificate | End of project | PI | Project interim report, Publish in NAFRI/AGI/KNU website |
| Guidebook 3 topic (local language Lao and Vietnam and English) and Video on processing soybean product | Number of topic and printing | 0 | 500 copies per topic per country (total 3,000 copies)  1 to 3 video | Finnal report | End of project | PI | Project interim report, Publish in NAFRI/AGI/KNU Journal and website |
|  | Objective 3: **Boosting Lao and Vietnamese soybean value addition through Korean models** | 5 soybean-based products will be developed | Number of product | 0 | 2 from Lao and 3 from Vietnam) | Result from FFS implementing | End of year | PI | Project interim report, Publish in NAFRI/AGI/KNU Journal and website |
| 2 FFS will be a pilot model in soybean-based products for commercialization | Number of community enterprise | 0 | 1 in Laos and 1 in Vietnam | Result from FFS implementing | End of year | PI | Project interim report, Publish in NAFRI/AGI/KNU website |

# Appendix 3: [proposal package] Indicative budget

*The budget should be presented in this section and provided in a separate Excel file*

# Appendix 4: [proposal package] Indicative Work Plan

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| Task | Month | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Output 1.** Find out the necessary core technology to increase soybean productivity | - Total budget as accumulation of activity budgets: 150,000USD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| ***Activity 1.1*** Develop breeding program by cooperate technology among member team (NAFRI, AGI and KNU) | - Budget: 55,000 USD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| ***Activity 1.2*** Improved soybean productivity through better soil, water, weed and pest management practices | - Budget: 55,000 USD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| ***Activity 1.3.*** Farmer field school (FFS) on the best management practice for soybean production and processing | - Budget: 40,000 USD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Output 2.** Raising awareness and capacity building on the nutrition-sensitive, benefits of soybean consumption, production and processing through training, workshop and attending farmer field school (FFS)) | - Total budget as accumulation of activity budgets: 135,000 USD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| ***Activity 2.1***. Young scientist of NAFRI and AGI will be trained short term | - Budget: 30,000 USD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| ***Activities 2.2*** Scientific visit among NAFRI, AGI and KNU | - Budget: 40,000 USD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| ***Activity 2.3.*** Conducted national training for developing trainers and facilitator on soybean production and processing at NAFRI and AGI | - Budget: 40,000 USD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| ***Activity 2.4.*** Develop education materials on the important and benefit of soybean consumption, production and processing | - Budget: 25,000 USD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Output 3.** **Boosting Lao and Vietnamese soybean value addition through Korean models** | - Total budget as accumulation of activity budgets: 150,000 USD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| ***Activity 3.1***. Conduct experiment on soybean processing to develop soybean products | - Budget: 70,000 USD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| ***Activity 3.2.*** FFS will implement new technique and technology on developing ready-to-eat products and semi-products of soybean for commercialization as pilot model in 2 to 3 FFS. | - Budget: 50,000 USD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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