

Research Activity Plan in 2024

Research subjects	Bgd	Chn	Ind	Kaz	Jpn	Mys	Mng	Phl	Tha	Vnm
1. Degraded Chitosan for Animal Feed			✓			✓			✓	
2. Hydrogel for Medical Application	✓	✓			✓			✓		
3. Environmental Remediation	✓			✓						✓
4. Synergistic Effect among PGP, SWA and BF		✓			✓	✓	✓		✓	✓
5. PGP and SWA, inclusive Process development				✓		✓		✓		
6. Mutation Breeding of Microbe using radiation		✓			✓	✓	✓			✓
7. Sterilization and sanitization using radiation	✓				✓	✓	✓	✓	✓	
8. Recycle plastic	✓	✓	✓						✓	✓

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<p>1. Degraded Chitosan for Animal Feed</p>	<p>Indonesia:</p> <ul style="list-style-type: none"> • Continuing to complete the data sheet of the effect of oligochitosan on various parameters such as immunity, histology, and reproduction of animals. • Trying to get funding support from BRIN, for down-streaming the oligochitosan as an animal feed supplement through a research-based start-up company called PT Ecomara Pandu Inovasi <p>Malaysia:</p> <ul style="list-style-type: none"> • Strategic collaboration for semi-field test. • Propose project with fund. • Development of preparation procedure and application for easy reference. • Guideline on KITOGAMA preparation. • Promotion of aquaponic to the urban agri & aquaculture industry. <p>Thailand:</p> <ul style="list-style-type: none"> • Working on new projects to turn chitosan into other types of products (aquatic feed) • Collaborating with researchers from the Faculty of Fisheries.
<p>2. Hydrogel for Medical Application</p>	<p>Bangladesh:</p> <ul style="list-style-type: none"> • Check antimicrobial activity of chitosan–Ag nanoparticles incorporated PVA-hydrogel. • Animal trial to check the compatibility of bioactive properties. • Further improvement of antimicrobial activity of chitosan–Ag nanoparticles by radiation. <p>China:</p> <ul style="list-style-type: none"> • Pilot scale of ¹⁷⁷Lu-labeled hydrogel microspheres for internal radiation therapy and clinical validation. <p>Japan:</p> <ul style="list-style-type: none"> • Hydrogels for regenerative medicine, and drug discovery • Nanoparticles and microfluidics for diagnostics <p>Philippines :</p> <ul style="list-style-type: none"> • Conduct Pilot Scale Trial • Secure IERB-approved Clinical Trial Protocol and FDA Certificate of Medical Listing • Conduct Pilot Clinical Trial • Conduct Pivotal Clinical Trial • Initiate Technology Transfer process

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<p>3. Environmental Remediation</p>	<p>Bangladesh:</p> <ul style="list-style-type: none"> • Intend to sample the waste water and try our hydrogels to investigate the removal capacities. This experiment can determine which hydrogel is better for maximum adsorption properties and percent removal capacity. • Collaborate with local laboratories of high-tech facilities to fill the gap of characterization. And we plan to create an amphoteric hydrogel that can remove both cationic and anionic pollutants from wastewater effluents by means of adsorption and recovering them back into the aqueous media by means of desorption. <p>Kazakhstan:</p> <ul style="list-style-type: none"> • Expanding the range of environmentally friendly cable and wire products. • Stimulating the development of renewable energy sources through the creation of domestic production of cable products. <p>Vietnam:</p> <ul style="list-style-type: none"> • Study on the treatment of waste-water from hospital using electron beam method. • Increase the efficiency of photo catalytic materials under sunlight.
<p>4. Synergistic Effect among PGP, SWA and BF</p>	<p>Common among participating countries:</p> <ul style="list-style-type: none"> • Improved microbial strains • Metagenomic, meta-transcriptomic, and metabolomic study of the identified microbes • Search for the suitable carrier for different type of biofertilizer (a consortium of bacteria, fungi, etc.), • Optimization of the production on the large scale • Improvement of equipment/techniques for biofertilizer production. • Promotion and extension of PGP, SWA and Biofertilizer

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<p>5. PGP and SWA, inclusive Process development</p>	<p>Kazakhstan:</p> <ul style="list-style-type: none"> • The use of conservation agriculture systems based on minimal mechanical impact on the soil up to its complete elimination, preservation and presence of plant residues on the soil surface (no-till technology). • Improving water efficiency in agriculture through the use of hydrogels <p>Malaysia:</p> <ul style="list-style-type: none"> • Strategic collaboration for semi-field test. • Submit proposal for funding. • Development of preparation procedure and application for easy reference. • Guideline on Application Procedure. • Come with the agricultural package mutant seed + PGP + Biofertilizer etc. <p>Philippines:</p> <ul style="list-style-type: none"> • Provide technical support to technology adaptor/private company. • Facilitate irradiation service of the Institute. <p>Thailand:</p> <ul style="list-style-type: none"> • Initiate a study to analyze the effects of SWA on plants and soil.
<p>6. Mutation Breeding of Microbe using radiation</p>	<p>Common among participating countries:</p> <ul style="list-style-type: none"> • Looking for financial supports for further studies • Develop standard protocol (guideline) for radiation mutagenesis (Fungal) • Molecular study of the potential mutant (pqq gene in bacteria), fungal etc. • Field trial of the potential mutants. <p>Malaysia:</p> <ul style="list-style-type: none"> • Publication “An E-book of standard guidelines of mutagenesis bacteria”

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7. Sterilization and sanitization using radiation	<p>Common among participating countries:</p> <ul style="list-style-type: none">• Due to the growing demand for commercial services, a scale-up is being planned. Additionally, there is a plan for expanding services to include sanitation using gamma radiation facilities.• Using γ radiation for sterilization carriers on BF for rice, wheat, and corn.• Promote and educate farmers and SMEs as well as provide nuclear technological information.
8. Recycle plastic	<p>Bangladesh:</p> <ul style="list-style-type: none">• Based on industrial consultation, the followings are recommendations (1) optimization of the cement-to-PET ratio, the binding materials and radiation dose (2) reduction of sand for the maximum strength and minimum brittleness of the concrete blocks.• Consult with some industries capable of producing concrete block. <p>Indonesia:</p> <ul style="list-style-type: none">• Continuing to reach the TRL 4 and 5 of the development of compatibilizer generated from irradiated recycled PE to be used in wood plastics composite. <p>China:</p> <ul style="list-style-type: none">• Study more other microplastics degradation pathways. Start to investigate natural microplastics. <p>Vietnam:</p> <ul style="list-style-type: none">• Study on the increase of mechanical properties of plastic waste (mesh waste) using irradiation for recycle purposes.