**Details of the Proposed Research Topic/Title**

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| **Research Proponent**  **Grade and Section** | Princess Janin R. Mayono  Janelle F. Cunanan  Justine Lloyd C. Musngi  Baron J. Musngi  Angel Enorasa  Rizalyn Alberto  12-Gold |
| **Research Teacher** | Mrs. Zenaida Samson |
| **Proposed Research Topic/Title** | Experimental Evaluation of Alternative Paper Packaging Using Bamboo Fiber and Cornstarch Properties |
| **Trends** | Bamboo considerable potential in paper making due to its properties. Bamboo fiber has a complex natural structure but offers excellent mechanical properties, which are utilized in the textile, papermaking, construction, and composites industry. Bamboo has mechanical proterties of fast growth and renewebility (Dauletbek et al., 2022)  The molding process, slender bamboo fibers mixed with starch were interwoven into a strong three-dimensional network structure, which resulted in the abundant formation of physical interwinding, fiber bridging, and hydrogen bonding. The above structural features conferred excellent strength, water resistance, oil resistance, better high- and low-temperature resistance, a low content of dissolved substances, and the capacity for rapid degradation when compared with plastic and polylactic acid tableware. (Chen et al., 2023) |
| **Issues** | Plastic pollution accumulating in an area of the environment is considered “poorly reversible” if natural mineralization processes occurring there are slow and engineered remediation solutions are improbable. Should negative outcomes in these areas arise as a consequence of plastic pollution, they will be practically irreversible. Potential impacts from poorly reversible plastic pollution include changes to carbon and nutrient cycles; habitat changes within soils, sediments, and aquatic ecosystems; co-occurring biological impacts on endangered or keystone species; ecotoxicity; and related societal impacts (MacLeod, Arp, Tekman, Jahnke 2021  Plastics are ubiquitous in the environment and have become a hot topic in academic circles. Extensive studies have focused on analytical methods, source, abundance, transport, fate, degradation of plastics in the environment and threats to natural surroundings, wildlife or even human health. (Bulletin of environmental contamination and toxicology 107, 577-584, 2021)  Accoring to Thushari & Senevirathna (2020) Plastic pollution is recognized as a severe anthropogenic issue in the coastal and marine ecosystems across the world. Unprecedented and continuous accumulation of growing plastic contaminants into any respective aquatic ecosystem by the anthropogenic sources causes direct and/or indirect interruption to ecosystem structure, functions, and consequently, services and values. |
| **Objectives** | To decrease reliance on plastic packaging, which contributes to pollution and environmental harm.  To reduce plastic use, the project aims to minimize human exposure to harmful chemicals that can leach from plastic packaging.  To decrease plastic pollution in the environment, which poses a significant threat to animal life, particularly marine animals.  To drive innovation in the packaging industry, exploring new and sustainable materials and manufacturing processes. |
| **Contribution** | Environment: This lessens the detrimental effects of plastic pollution on ecosystems and species, as well as helping to create a cleaner environment.  Economic: packaging can often be more affordable than conventional plastic packaging and lowers transportation costs and boosts local economies  Animals: safe from entanglement hazards posed by large pieces of plastic Human: reduces the risk of exposure to harmful chemicals |
| **References** | Matthew MacLeod, Hans Peter H Arp, Mine B Tekman, Annika Jahnke (2021) The global threat from plastic pollution retrieved from: <https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=plastic+pollution&oq=#d=gs_qabs&t=1726134422670&u=%23p%3Denu7zHjeLxkJ>  Penghui Li, Xiaodan Wang, Min Su, Xiaoyan Zou, Linlin Duan, Hongwu Zhang (2021) Characteristics of plastic pollution in the environment: a review retrieved from: <https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=plastic+pollution&oq=#d=gs_qabs&t=1726134422670&u=%23p%3Denu7zHjeLxkJ>  Gajahin Gamage Nadeeka Thushari, Jayan Duminda Mahesh Senevirathna (2020) Plastic pollution in the marine environment retrieved from: <https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=plastic+pollution&oq=#d=gs_qabs&t=1726134438140&u=%23p%3DLSF0CBhU55EJ>  ACS Sustainable Chemistry & Engineering 11 (19), 7407-7418, 2023 Replacing plastic with bamboo: eco-friendly disposable tableware based on the separation of bamboo fibers and the reconstruction of their network structure retrieved from: <https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=paper+packaging+using+bamboo+and+cornstarch+&btnG=#d=gs_qabs&t=1726151964105&u=%23p%3DCEJ_YGXZPucJ>  Chen, Li, Dauletbek, Shen, Hui, Gaff, Lorenzo, Corbi, Corbi, Ashraf, (2022) Properties and Applications of Bamboo Fiber-A Current-State-of-the Art retrieved from <https://discovery.ucl.ac.uk/id/eprint/10136441/> |

**Format**

**Font Style: Times New Roman**

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**Paper: 8.5x 11 or short bond paper**