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**Science, Technology, Research and Innovation for Development
(STRIDE)**



**Upscaling Business and Engineering Technology
(UBE-Tech) for the Purple Yam Industry in the
Northern Philippines**

GRANTEE: Don Mariano Marcos Memorial State University (DMMMSU)

PRINCIPAL INVESTIGATOR: Engr. Raffy Espiritu

INDUSTRY PARTNER: Chemfree Foods

GRANT PERIOD: August 1, 2015 to April 30, 2017

GRANT AMOUNT: Php 4,481,970 (approximately USD95,400)

Improving the purple yam industry

Ube jam, made from Philippine purple yams, has become an iconic food item in the Philippines, especially in the summer. It is actually a collective product of Filipino farmers in Northern Luzon. Although the popular *ube* jam is cooked and sold in Baguio City, raw *ube* tubers are sourced from the different farmers groups throughout Northern Luzon. Raw *ube* tubers are seasonally available and are oftentimes in short supply. *Ube* is claimed to have nutraceutical and pharmaceutical value, as it is rich in anthocyanin and other naturally occurring bioactive compounds. It is also the highest priced among commercially grown root crops, bringing in from Php 25.00 to Php 40.00 per kilo across seasons and variety at the farm gate level. However, the purple yam industry value chain has recurring problems of seasonal production, overproduction, and the rejection of farmers' harvests that could not be readily absorbed by the existing market.



Extracted anthocyanin produced at the Agricultural Bio-Products and Food Engineering lab at DMMMSU

To provide solutions to these production and operational concerns, DMMMSU Department of Agricultural Engineering, with support from USAID STRIDE, initiated the upscaling and establishment of viable, locally generated technology for value-added products and extraction of bioactive compounds from anthocyanin-rich Philippine purple yam (*Dioscorea alata*) varieties.

Milestones

Initial results of the ongoing implementation are as follows:

- Fabrication of the laboratory scale drying unit for *ube* processing that can accommodate a capacity of at least 400kg/day compared to the 150kg production using the old dryer;
- Upscaling of the DMMMSU drying technology to improve dehydration capability of the *Ube* Processing Facility;
- Upgrading of the *Ube* Processing Facility to a pilot plant scale to serve as a common service facility for local industry players and farmers' groups wishing to venture in *ube* powder processing and other related value-added products;
- Levelling up the operation and business prospects of the *ube* enterprise through the partnership with Chemfree Foods, a locally-based food processing enterprise in Bacnotan, La Union, which will develop quality products that are all natural and preservative or additive-free;
- Characterization of anthocyanin extraction confirming that the physico-chemical properties and bioactivity of the natural color of *ube* is safe and fit for human consumption, so it can be commercialized for utilization by food manufacturing industries; and
- GIS-based mapping was able to generate up-to-date and digitally accessible database of the *ube* supply chain in Northern Philippines. The GIS-based Purple Yam Industry Database has provided exact locations of existing *ube* production areas within the target area of the UBE-Tech Project. Based on the criteria used for the identification of potentiality, La Union and Ilocos Sur municipalities have high to very high potential for *ube* production expansion. Eight municipalities in La Union and seven municipalities in Ilocos Sur have very high potential for *ube* production.

Moving forward

Active participation and engagement of stakeholders is a major pillar of the UBE-Tech Project. Along this line, a memorandum of agreement was signed between DMMMSU as UBE-Tech project implementer with local governments of Langcuas, City of San Fernando, La Union, PHILMECH, and Chemfree Foods. A partnership was likewise forged with the Small Business Corporation, a government financing institution attached to the Department of Trade and Industry (DTI), as a standby capital loan provider among local farmers interested in *ube* production under the Pocket Farmers Loan Window. Two farmer cooperatives from Benguet have used this financing window, while Ube-Tech supplied the *ube* planting materials.



Engr. Espiritu explains the operating procedures of the mechanical laboratory scale-dryer fabricated through the USAID STRIDE grant

Highlighting the Research and Extension Day event during the commemoration of the 36th Foundation Anniversary of DMMMSU on January 19, 2017, is the launching and commissioning of the UBE-Tech Project, where the *ube* processing system was demonstrated to researchers, potential industry partners, and *ube* farmers.

These developments indicate that the project has the potential to make the purple yam industry sustainable, competitive, and profitable.