



Making an impact
for the community
**Biotech Farms,
Philippines.**

Innovations for a **better** world.

BÜHLER

Rice is the main staple food of Philippines' fast growing 100-million people population. In past decades though, the countries' agricultural sector has struggled to keep pace with the increasing demand. The Philippines, once a self-sufficient major rice country producer, has become one of the world's largest rice importers, getting its milled rice from Thailand, Vietnam and India. Biotech Farms decided to invert that trend with an ambitious plan to reinvigorate local farming on the Mindanao island and invest in a state-of-the-art paddy-to-rice processing facility.

To fulfill that ambitious goal, Biotech Farms has created an integrated Agro-industrial Complex near Koronadal. The site features a biogas powerplant, a biomass powerplant, a corn processing plant, a state-of-the-art feed mill, a paddy processing plant, a rice mill and a rice reprocessing facility.

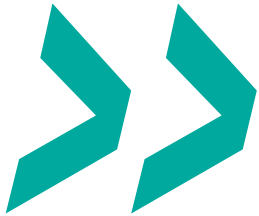
This new plant combined with a determined plan to support local farmers by increasing their production yield through assistance in farm input, introduction of farm mechanization and training, will bring a positive impact on the Region XII's farming community.

Biotech Farms chose Bühler and its partners to engineer and bring that large project to life. Initial discussions started back in 2014. After land preparation was completed and equipment delivered, the project was commissioned in phases between 2018 and 2019.



3-pass paddy drying towers

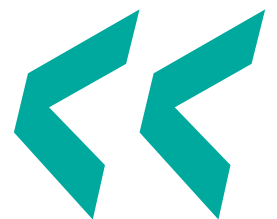
14 paddy bins for 28,000 tons storage



*Bühler helped us scale our operations
and contributed largely to
our circular economy business model.*

*We are excited to positively impact the lives
of more than 10,000 local farmers.*

Rey Chiang, Chief Executive Officer,
Biotech Farms Inc., Philippines



Full processing from paddy to rice.

Biotech Farms agricultural complex can receive up to 600 tons of paddy per day from local farmers from the Philippines region XII. Wet paddy is consecutively cleaned, dried and processed into clean rice.

Incoming wet paddy is transported to the Biotech Farms by trucks where it is deposited into intake pits. The paddy is then sent by conveyors for a first round of pre-cleaning and then stored in temporary bins.

The wet paddy is transferred to a 3-phase continuous drying line to bring down the moisture. For specific varieties available in smaller batches, Biotech Farms is also installing a batch drying line from Bühler which will be commissioned later in 2019. Upon reaching an optimal moisture level, the paddy is then chilled and stored in large 2,000t bins, waiting to be sent to the rice mill.

Connected to the silos through conveyors, Biotech operates a 20t/h rice mill, equipped with Bühler technology at every stage: from intake, to cleaning, polishing, whitening, grading and bagging. The mill features a 2-pass optical sorting system. The first pass removes color defects while the second pass rejects chalky rice from the main white rice output.

The rice mill has been built with a special focus on hygienic design and food safety. The mill layout is clearly zoned in order to separate process areas. Areas with high dust concentration (bran, bagging) are separated from areas with low dust concentration (production, packing). The office area is also clearly separated. A visitor walkway has also been set up to allow visitors to pass through the floors without disrupting or contaminating production.

Next to the rice mill, Biotech Farms built a reprocessing mill, which aims to improve and add value to the milled rice of local farmers.

The white rice processing lines end with automatic bagging lines, also by Bühler. The final product is then put onto trucks and sent across the island to be sold through a network of malls, rice wholesalers and retailers.

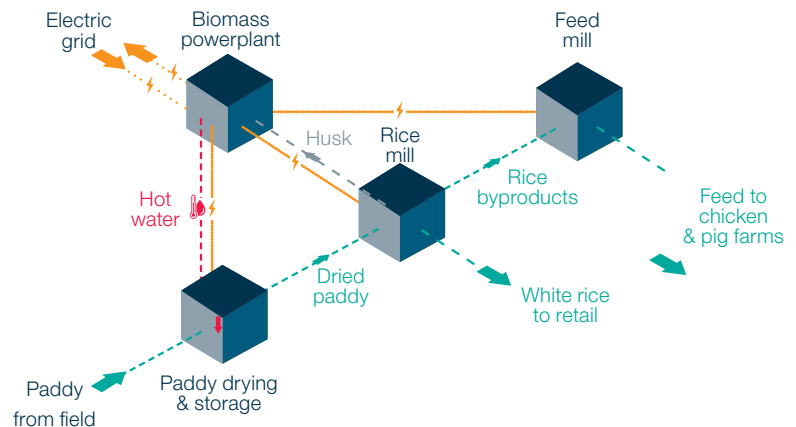


Built as a self-reliant and sustainable loop.

The Koronadal Agro-Industrial Complex has been designed to recover as much waste as possible for renewable energy production. Its close-loop design generates savings for Biotech Farms and ensure a more reliable and sustainable operation.

The rice husk, waste from the milling process, is sent through pneumatic tubes to be incinerated in the biomass power plant.

The biomass plant features a Vyncke furnace, generating hot thermal oil for the production of electricity using an Organic Rankine Cycle (ORC) Turbine-generator. Hot water is produced from the ORC Turbine-generator as well as from the waste heat of the furnace.

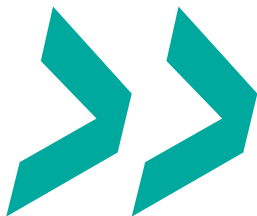


The 13.2kV electrical installation across the full Complex, engineered and commissioned by Bühler's sister company Bühler+Scherler, draws all its needed electricity from the biomass powerplant with excess electricity exported to the local utility grid.

Hot water is circulated through the full Complex to the corn processing plant and paddy drying lines. This generates the hot air needed to operate the dryers and provides significant energy savings to Biotech Farms.

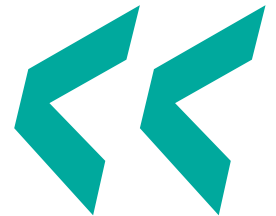
The remaining byproducts of the rice mill (rice bran, rice tips, immature grains) are also recovered and sent back to the feed mill for further processing into pig and poultry feed.





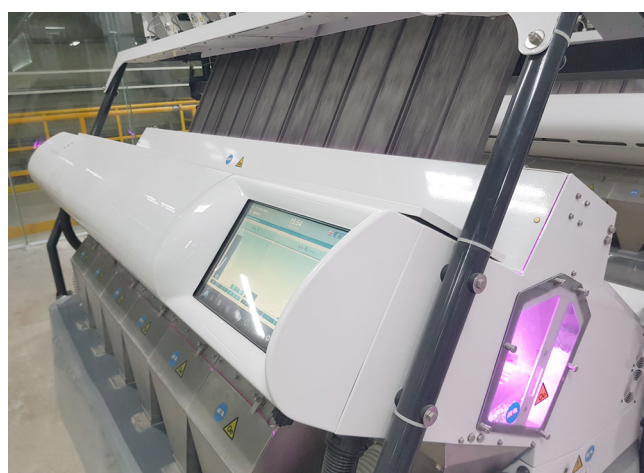
Bühler's equipment reliability combined with their attentive customer service help us maintain high-level yields and quality, resulting in rice that our customers will enjoy eating and buying again.

Erwin Saballa, Chief Operating Officer,
Biotech Farms Inc., Philippines



The project at a glance.

	Type	Capacity
Intake	x3 intake pits for trucks	65t/h
Pre-cleaning	x3 LALA paddy cleaners x2 SMA cleaners x1 LACB cleaner x6 wet paddy bins	25 t/h 25 t/h 50t/h 700t
Paddy drying	x3 continuous dryer towers from 32% to 13% m.c. x5 batch dryers LELA from 28% to 14% m.c. (2019)	21.5t/h 150 t per batch
Paddy storage	x14 dried paddy bins	28,000t
Rice processing	x1 rice milling: Intake, intake, cleaning, paddy separation, thickness grading, whitening, polishing, grading x1 reprocessing line	20 t/h
Optical sorting	x2 Sortex S6 for colour removal x2 WV-7 for chalky rice removal	20m³/min
Weighting and packing	x2 lines for large bags packing x2 lines for small bags packing	20-50kg per bag 02-10kg per bag
Commissioned	Final phase in September 2019	



Biotech Farms, Inc.

Office

Biotech Farms, Inc.,
9511 Banga, South Cotabato, Philippines
+63 (83) 228-2315 local 2535

Email

info@biotechfarms.com
biotechfarms.com

Bühler Southeast Asia and Oceania

Regional office

Bühler Asia Pte. Ltd.
73 Bukit Timah Rd,
#04-01 Rex House, Singapore 229832

Telephone

Australia: +61 3 9872 7900
Bangladesh: +880 2 8878066
Cambodia: +855 23 985 282
Indonesia: +62 21 2977 9392
Malaysia: +60 3 5870 2038
Myanmar: +95 9 954 947555
Philippines: +63 2 844 7500
Singapore: +65 6826 6900
Taiwan: +886 3 550 7373
Thailand: +66 2 712 2600-1
Vietnam: +84 272 3769 045

Email

southeast.asia@buhlergroup.com
buhlergroup.com

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