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## **Sugarcane Farm Mechanization is the Solution. *What are the Problems ?***

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To boost the production of sugarcane and sugar, and increase the incomes of sugarcane farmers/planters .... a Sugarcane Farm Mechanization Program at the mill district levels and block farms shall be encouraged for efficient planting, cultivation, care and maintenance, harvesting and handling of sugarcane. Republic Act No. 10659. "Sugarcane Industry Development Act of 2015". SEC. 3. Productivity Improvement Programs. Sugarcane Farm Mechanization Program mechanization is in the Law (R.A 10659). But what are the many interrelated problems which influence the farm level implementation of mechanization ? Financing as the imported machines are expensive, Machine types suitability in relation to farm size and farm operation; Machine brand/size (Hp) in relation to farm size, affordability, choice/ preference; Labor displacement/ livelihood for displaced workers; Ability of the Mills to adjust milling operation with trashy/mechanically harvested canes. What went wrong ? Is it a case that these situations were not anticipated earlier ? In a way yes, the Philippines is yet to put in place A National Industrial & Agricultural Policy . There is a law on agriculture and fishery mechanization (R.A 10601). Where are the funds ? The Philippines is yet to manufacture engines, spare parts etc.

**Keywords:** farm mechanization, sugarcane, engines, livelihood, industrial policy

### **Introduction**

Sugarcane planters are into frenzied efforts to adopt farm mechanization due mainly to decreasing farm labor availability .Even in other crops, rice, for instance, mechanization is also a felt need.( *There was book recently published on Rice Mechanization*). The decreasing labor availability may not be easily understood as unemployment in the country is high. Many operations are affected from planting, weeding, ratooning, detrashing or trash farming and harvesting. Because of these, there many overmatured canes waiting to be harvested. Sugar mills are operating below rated capacity in a day or there some days that they are not operating or milling canes at all.

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Ultimately, these will affect the aggregate sugar output in the country that may result to sugar importation.

Why mechanize when there are many who are unemployed in the country? It was recognized by many sugarcane planters that off-farm or sugarcane plantation work options elsewhere are already available and farm workers are leaving the farms:

1) There is rise in infrastructure building, road/ bridges construction in the country (floods/ strong typhoons destroy houses, buildings, roads, bridges, they need to be repaired/ reconstructed). It happens all over the country that there is widespread construction of new houses, condominiums, high rise – big buildings (shopping malls, offices, multipurpose) tourist spots development, construction. This is short of saying that there is construction boom in the country. All of these require manpower/labor.

Wages paid in construction are higher especially for the skilled carpenters/ mason. Work is less strenuous or difficult. Rural farm workers prefer to work in construction.

2) For farm workers leaving the farm is oftentimes a *life changer* for they meet other people in other locations.

3) Availability of overseer jobs – domestic help for females, labor overseas construction.

4) Work in the sugarcane field is difficult especially loading canes in the truck.

Difficult job in cane field, plus the availability of other jobs (construction, easier job as domestic helper, or store keeper for females) altogether adds up to the situation of decreasing labor availability in the sugarcane farms.

Who are left in the fields are : ageing workers who are unable to load cane, younger men who does not have skills on carpentry, masonry for constructions locally or abroad and relatively older women.

Increasing population means more people need to be transported. Those who learn how to drive tricycles, jeepney would leave the field and drive vehicles.

Labor demand in sugarcane fields is seasonal. This exerts pressure among able bodied male/ female to look for jobs elsewhere. Those who find better or high paying jobs elsewhere will no longer come back to the farm.

*SOLUTION: Mechanization*

Objectives: This paper attempts to dissect and discuss the many interrelated concerns to be addressed and requirements to be provided to make farm mechanization in sugarcane production successful in the Philippine context and in ASEAN region where sugarcane is similarly grown.

## Methodology / Approach taken in the study

Through informal discussions with managers and/or owners of sugarcane farms, the many problems and concerns of sugarcane production were discussed. This was done for about a decade of continuing farm visits and dialogues with the concerned sectors. Selected reviews and literatures related to the topic were also read.

## Discussions

There are many interrelated problems which influence the farm level implementation of mechanization as follows :

1. *Financing as the imported machines are expensive.*
2. *Machine types suitability in relation to farm size and farm operation*
3. *Machine brand/size (Hp) in relation to farm size, affordability, choice/ preference*
4. *Labor displacement/ livelihood for displaced workers*
5. *Ability of the Mills to adjust milling operation with trashy/mechanically harvested canes*

***Financing as the imported machines are expensive*** .Planters are complaining that interest rates for financing machine acquisition are high (Land Bank of the Philippines' interest rates are higher than private banks). Mendoza *et al.* (2004) had calculated if the interest rates go beyond 6%, the added yield or income is not enjoyed by the farmer as the added income goes mostly for debt servicing . It means the banks enjoy more the return from the efforts and investments made by the planters. (Suggested interest rates 3 to 5%).

Prices of machines are high which made the principal + interest on loans high. Prices of machine are high because they are imported. *Immediate Solution: tax-free imported machine. This could be done through Cooperative (Castillo,2015 )*. Block farms should be ultimately organized into *Cooperative*.

Planters/farmers are doubly jeopardized due to their inability to manufacture machines; they are imported hence , high prices. If acquired through loans , there is high principal + interest on loan ; and imposing tax on the machines add greater burden for the planters.

Result: many machines of museum type (>40 years old) are still being used. This leads to the following : frequent & costly repair which delay field operations; Less-efficient → increasing the energy/money cost of operation;

Delayed operations affect the productivity (quantity + quality) of canes produced; Old machines could not be used for deep tillage (vertical tillage/ chiseling) which delayed operations and also affect quantity + quality of operations. Moreover, speed of work is slow.

*Immediate Solution: upgrading of machines.*

Machines are assembly of parts consisting of engine (main part and many more >20,000 parts), tires, plus the attachment or implements. The Philippines may not be able to manufacture locally the engine within the next 10-20 years. But the tires and attachments/ implements/ plow, chisels, platform base, etc. can be manufactured locally. There is no “rocket science” involved. Importing them penalizes the users as the price increased excessively.

*Example: 1,000 kg disc harrow set is priced at P350,000. The raw metal part at P50/kg is only worth P50,000. The metal value increased 7 times.*

***Machine types suitability in relation to farm size and farm operation.***

Also, many imported machineries and their implements are not directly suited in our local farming conditions. Most farms are small, in turn, they need small machines. Farms are on slopes. Big machines are not suited and tires must be adjusted.

Farm implements/ attachments must be re-adjusted to suit farm operation as follows:

*For Primary Tillage/ plowing, disc plows/ mold board plows are no longer suitable to soil condition. Plow clods must not be inverted. Chiseling the soil (criss-cross) to avoid losing soil moisture, disruption of organic matter, soil carbon on the root zone is now the adapted primary tillage technique. Developing hard pan must be broken with extended ratoon to improve water infiltration, make the soil porous to improve aeration. Chisel plowing accomplishes the stated outcomes.*

*Interrow cultivation for Plant crop and ratoon*

To save on energy, tractor implements like mechanical planters should have also fertilizer, composts and other liquid concoctions applicators all done in 1 pass. But attachment must be adjustable to suit planting/ furrow distance. In the *Ratoon canes*, trash shredders must also be designed. *Trash farming is necessary* to re-build soil, increase soil organic carbon, improve water retention and other benefits (Mendoza *et al.* 2004). This requires trash shredder tractor attachment (but blades get dull easily). In turn, this needs disc harrow blades that can cut the trash.

Ridge busting/ cut-away blades (adjustable to suit planting/ furrow distance 1.5 m single row, double rows, triple rows) should be locally prepared to suit the soil conditions and farm operations. There are many details to be considered in the design and manufacture of specific farm implements to suit local conditions.

***Machine brand/size (Hp) in relation to farm size, affordability, choice/preference.*** There are many brand/ manufacturer of machines (Japan, Europe, USA, and recently South Korea and China). China made products 5 years ago are believed to be of low quality. But recent developments show that they are catching up quality-wise or improving quickly. They are cheaper (1/3 to 1/2 the price) of known time-tested brands (P1.5 Million vs P3.5 Million). Time value of money or interest expense and other equally important factor for the farmer dictates that cheaper brand will be the planter's choice. Recommended by the government for financing are the expensive but time-tested brand. ***Action: need to liberalize the government policy.***

***Mills to adjust milling trashy/mechanically harvested canes.*** Mechanically harvested canes could have up to 20% trash although recent models of combines are effective in removing the trashes but they are more expensive. If there will be proportional yield deduction of delivered canes to the mill, no planter will be motivated to harvest their canes mechanically. But what are the effects on the part of the mills when they mill trashy canes. Can they remedy the trashy-canes problems during the milling process? Adjustments may mean added costs on their part.

Moreover, in the field, fully mechanized harvesting (using big combine machine) need to adjust or consider the following: 1. Smaller farm/lot sizes; 2. Rugged to sloping terrain; 3. Soils becoming slippery when wet or becoming inaccessible to the combine and hauling trucks when the soil becomes soft (clayey soils) when it rains heavily (it's climate change!).

***Labor displacement/ livelihood for displaced workers.*** Labor displacement is one major concern raised against mechanization. Will this be an issue now when pressures to mechanize is due to the declining availability of harvesters or farm workers? In any country where mechanization had been introduced, this issue was raised. But how did they counteract or address it.

Initially, there was livelihood or the work activities are designed for the displaced farm workers. There should be actual survey listing workers who would be displaced.

➔ Mechanical planting

➔ Cultivation (in furrow)

➔ Weeding

➔ Mechanized harvesting only very few, large, farmer are suitable for fully-mechanized harvesting or combine harvesting.

Only cane loading is currently being entertained. Grab loader is very expensive (P3.5 M/unit). By the time locally assembled and affordable grab loader are available, the difficulties of harvesting and loading could have intensified.

>Mechanize cane loading will open more work for female women in cutting canes.

>Trash farming to be effectively done requires detrashing. This shall replace the other displaced work.

>Integrating carabao and cattle will open livelihood (dairy-based for women).

>Diversifying – planting fruit trees, less suitable to sugarcane, will provide more income and livelihood due to processing.

>Food processing that make use of sugar shall open more jobs/ livelihood for men/ women.

Local manufacture of parts for the equipment, tools, machineries, shall generate/ require labor across different stages.

***What went wrong ? Is it a case that these situations were not anticipated earlier ?*** In a way yes, the Philippines is yet to put in place ***A National Industrial and Agricultural Policy*** .. There is a law on agriculture and fishery mechanization . Where are the funds ?

1. We have yet to revive Republic Act No. 7103 ; The Iron And Steel Industry Act (August 8, 1991). *An Act To Strengthen The Iron And Steel Industry And Promote Philippine Industrialization And For Other Purposes* . Under Section 8, all fiscal incentives in this Act shall... for the duration of fifteen (15) years. In other words, *incentives embodied in this Act ended last 2006* or 10 years ago. Meanwhile , Iligan steel mill is at varying stage of metamorphosis (decay!). The government is yet to decide what to do about it.

But in 2013, REPUBLIC ACT No. 10601, the Agricultural and Fisheries Mechanization (AFMech) Law"was enacted . Under Section 2 of the law declares that it shall be the policy of the State to:

(a) Promote the development and adoption of modern, appropriate and cost-effective and environmentally-safe agricultural and fisheries machinery and equipment to enhance farm productivity and efficiency in order to achieve food security and safety and increase farmers' income;

(b) Provide a conducive environment to the local assembling and manufacturing of engines, machinery and equipment for agricultural and fisheries production, processing and marketing;

(c) Ensure the quality and safety of machineries and equipment locally manufactured or imported by strengthening regulation through the development and enforcement of machinery and machine performance standards, regular testing and evaluation, registration, and the accreditation and classification of suppliers, assemblers and manufacturers to ensure compliance to prescribed quality standards;

(d) Strengthen support services such as credit facilities, research, training and extension programs, rural infrastructures, postharvest facilities and marketing services;

(e) Unify, rationalize and strengthen the implementation, coordination of activities and mechanisms on agricultural and fisheries mechanization programs and projects; and

(f) Deliver integrated support services to farmers, fisherfolk and other stakeholders, and assist them to be able to viably operate and manage their agricultural and fisheries mechanization projects.

In short, the law is there to promote Farm Mechanization . But where are the machines ? Stipulated in the law is the engine manufacture. In the early 70's, some Filipino engineers had started manufacturing small engines. Obviously, it was not sustained . The IRR was signed in 2014 and a 5 year national mechanization program was formulated. We have law but there was no specific funds cited in both the Law and its IRR.

Furthermore, it is only the sugarcane industry which have Development Program enacted into a law under Republic Act No. 10659 ,the Sugar Industry Development Act (SIDA) .. Where under SEC. 3. Productivity Improvement Programs and letter (c) *Farm Mechanization Program*. – Planters/farmers of sugarcane farms, including block farms and farms of agrarian reform beneficiaries, shall be encouraged and trained to utilize appropriate agricultural machineries and equipment necessary for the efficient planting, cultivation, care and maintenance, harvesting and handling of sugarcane. That SRA, the DA and the DAR, in partnership with local government units (LGUs), consistent with the provisions of Republic Act No. 10601, otherwise known as the “Agricultural and Fisheries Mechanization (AFMech) Law”, shall:

(1) Introduce or expand the use of machineries for the different stages of sugarcane farming;

(2) Formulate and implement a Sugarcane Farm Mechanization Program at the mill district levels and block farms; and

(3) Support the establishment, operation and maintenance of Agri-fisheries Machinery and Equipment Service Centers, as provided in Section 9 of Republic Act No. 10601, in sugarcane areas and, for this purpose, provide socialized credit to service centers: Provided, That these service centers shall emphasize the provision of plowing, harrowing, weeding, fertilization, harvesting and other farm mechanization services to sugarcane farms that do not have the capability to purchase or maintain their own machineries and equipment.

To develop and deploy appropriate machineries and equipment, the SRA, through its research centers, in collaboration with the Philippine Sugar Research Institute, the Philippine Center for Post-Harvest Development and Mechanization, the Bureau of Agricultural Research, SUCs, other concerned government agencies, and industry stakeholders, shall formulate and conduct a research, development and extension program for sugarcane farm mechanization and engineering.

The LBP shall manage the socialized credit facility under the Farm Support Program and the Farm Mechanization Program. The SRA, the DA, the DAR, and the LBP shall issue the guidelines on the administration and lending of the socialized credit facility.

*In Conclusion.* Machines are needed in various stages of sugar production from sugarcane. But machines should be manufactured locally especially the parts, and attachments. Local manufacture of engines may not be done in a decade or 2 but it will not come if we do not start now.

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