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Corn Transformation Machine as Media Increases Threshing Productivity of Corn Village Prupuh, Panceng Sub - District, Gresik Regency

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Abstract:

Prupuh village is a village in the district Panceng by having a hamlet that Hamlet Prohibition. 2000 more residents in the village Prupuh with 575 heads of household, and 400 homes were built. In general livelihoods of the majority of the villagers are farmers Prupuh. In the rainy season corn is one of the crops grown by the residents both in the fields and in the yard. Corn Transformation Machine addressed to the villagers of Prupuh that planting corn with manual harvesting. People have become less productive because of the time needed to separate the corn from bongkolnya very long. From the experimental results using Corn Transformation Machine tool time needed to separate the corn seed from bongkolnya ie 30 seconds per 1 piece of corn, while if using a hand (manual) takes 5 minutes per 1 piece of corn. The tool can save time for 4.5 minutes and simultaneously increase productivity the amount of corn kernels are separated from bongkol.

Keywords: Corn Transformation Machine, Productivity, Tools Corn Thresher, Prupuh village.

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Introduction

Geographically, the village is located in the District Prupuh Panceng, Gresik. Prupuh village location is adjacent to several villages, to the north bordering with Dalegan village, west side there is the village of Ujung Pangkah, while the south is surrounded by PT Perhutani (Persero), and for the east adjacent to the village and village Campurejo Ketanen (Prupuh, 2015),

Prupuh village consists of several Hamlet, namely the prohibition Hamlet, Hamlet Seberoh (Stone Bolster). In general livelihood of citizens can be identified Prupuh village into several sectors, farmers, traders, civil servants, farmers, factory workers and some look for work abroad. The majority of the residents are farmers work the fields and the fields, because the village Prupuh still have rice fields and fields (garden) remaining. Rural people's habits Prupuh at the end of the dry season a majority of the corn plant in the yard which has an average area of 20m2 (Yudi, Corn, 2019), Harvested corn is used for animal feed and partially consumed.

Maize (Z. mays) has grown since thousands of years ago. In Indonesia, the plant that comes from America is already known approximately 400 years ago. In Indonesia, the corn cultivated in diverse environments. Corn in the production of about 79% corn planting area is located on dry land, the rest is found in 11% of irrigated rice and rainfed 10%(Kasryno, Development of Corn Production and Consumption World Over Four Decades ago and Implications for Indonesia, 2002),

Corn plants including class monocotyledone, orders gramine, familia graminaceae, genus zea, species Zea mays and a monoecious plant (monoecious), the male flowers (staminate) formed in panicles and female flowers (tepistila) is located on the cob in the middle of the stem separately but still in one plant (Sudjana, 1991),

Fibrous roots of corn plants consisting of the seminal roots, adventitious roots and aerial roots that have a parent stem, cylindrical consists of a number of segments. In the book there are buds that develop into cob. Plant height varies 60 to 300 cm,

depending on variety and location. During the vegetative phase will begin to form on the leaf buds sprout. Each leaf consists of the leaf blade, leaf midrib LIGULA and are closely attached to the rod (Subandi, 2008),

The process of harvesting corn in the village Prupuh still manual, do not use corn thresher motors for land owned small-sized reatif and yields are not comparable to the cost of renting thresher (Yudi, Corn Harvesting Process, 2019),

With the manual harvesting, then the citizens of corn peeling of the skin before drying. The drying time of approximately 4 to 7 days. Furthermore, corn kernels are separated from bongkolnya by hand (manual).

Almost all the residents in the village of Batu Prupuh precisely in Hamlet and Hamlet Guling Prohibition still perform manual stripping corn. It makes one topic issues raised in community service in the village Prupuh.

One of the mechanical equipment for postharvest handling of corn is corn sheller tool. Currently, corn sheller tools mechanically very hard to get farmers, the necessary tools semi-mechanical corn sheller. Sheller tools apply simple technologies that can assist farmers in post-harvest handling and easily available at affordable prices, so that small farmers can easily operate(Harmaji, 2007),

Corn sheller tool is one of the tools designed to improve outcomes corn. Rivanto has designed a semi-mechanical tools corn sheller. After testing by Rivanto found some problems and weaknesses of these tools are being lodged corn cobs that are large in order to position the tool and tool often experience a shift in time pemipilan process (Seed Tresting). Corn sheller design tool Rivanto need to be modified with a simple design, making it easily replicated by local workshops, or even by the farmers themselves either individually or as a group(Rivanto, 2009),

So Corn Transformation Machine made by community service groups in the village Thematic prupuh, by modifying existing tools (Sanjaya, 2017),

A. Objectives

The purpose of the program dielenggarakanya krja "Transformation Corn manufacture Machine in the village Pruuh panceng District of Gresik", ie To speed manual stripping time of 5 minutes to 30 seconds with Corn Transformation Machine per 1 seed.

B. Benefit events

For citizens:

a. Simplify the process of separation from the corn seed bongkolnya
b. It saves time in the separation bij corn.
c. Increase productivity

For students:

a. Applying scientific techniques in industries that can be on the bench lectures.

Method

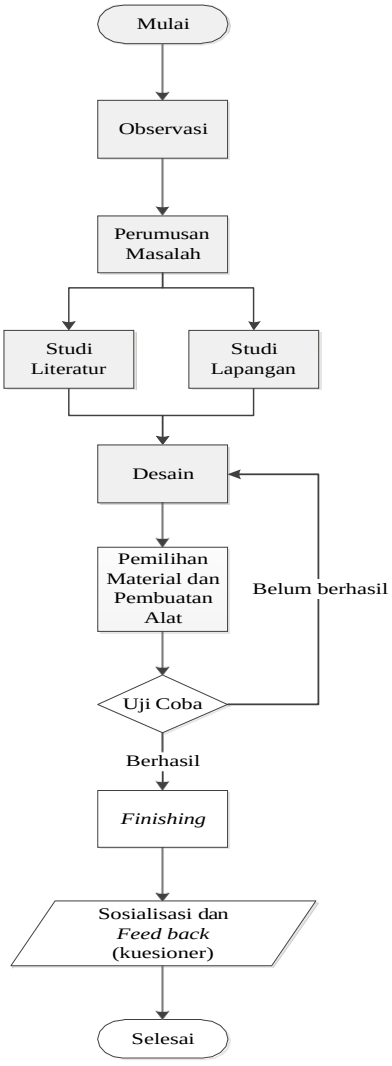

Figure. 1 Design Implementation

C. Scope / Object

The scope of this research was conducted in the village of Batu Prupuh Teguling precisely in Hamlet and Hamlet Prohibition.

D. Time and Place

Adapaun name of activity, place and time of implementation are presented in the following table.

Table 1 Activity, Place and Time

Name of activity	The place	Time
Observation	Stone Hamlet Guling	December 28, 2018
Toolmaking	Village Prupuh	January 26, 2019
Socialization	Stone Hamlet Guling	March 2, 2019

E. Data collection technique

Data collection techniques performed by researchers that is by direct interview to the citizens to know the conditions faced by citizens in daily activities.

F. Data analysis technique

At this stage, the activities related to engineering analysis done by way of a direct comparison of the results of trial and error to determine the factors that influence the effectiveness and efficiency of the tools that have been created.

Results and Discussion

A. Manufacturing Equipment

a. Tool.
   1. Electric welding
   2. grindstone
   3. Las acytilin

b. material
   1. Holo iron 6 meters
   2. 50 cm long iron pipe
   3. 3 mm thick iron plate
   4. Nuts and Bolts
   5. *spray* piloks

c. Ways of making
   a. Prepare iron Holo measuring 6 meters and then cut to a size of 120 cm to grip a tool, then cut the iron holo again with a size of 90 cm 2 stalk and 35 cm 5 stick to the framework of such a tool, then cut again with a size of 35 cm and 45 cm respectively each 2 feet from the stick to the framework of the tool, then cut again to the size of 70 cm, 30 cm and 25 cm for the securing of the tool handle, then cut again to 30 cm for suppressing corn, then welding pieces of iron holo until forming the framework.

Figure 2 Making the Transformation Framework Corn Machine

   b. Rare hereinafter set iron plate then cut with welding acytilin with a diameter of 30 cm in a circle, then cut again in the iron plate in the form of a rectangle with a length of 60 cm and a width of 15 cm to weld on the disc to encircle the disc, then cut again iron pipe with a length of 15 cm to the blade of the threshing tool, then cut again the iron plate with a diameter of 20 cm and then pursed for driving corn.

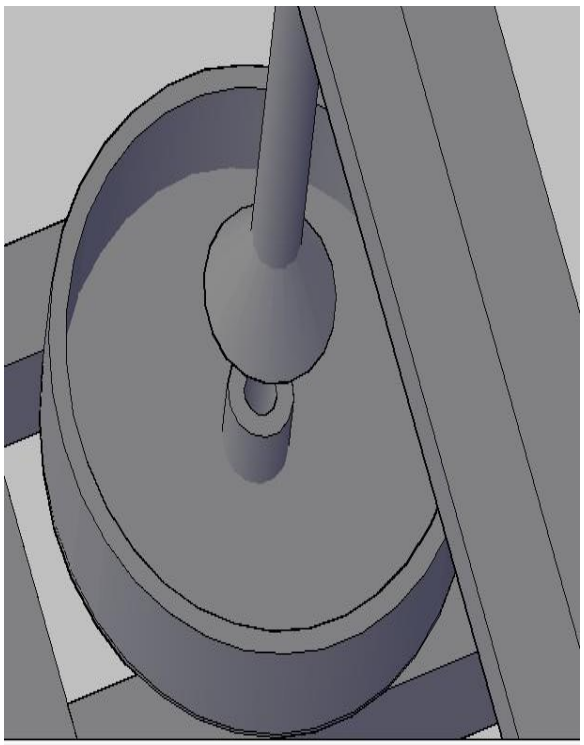

Figure 3 Corn Transformation Eyemanufacture Machine Knives

c. The next step dish, knife, and a funnel in combination with the frame of the apparatus so as to form a framework as shown below

Figure 4 Merger Framework and Eye Knife Corn Transformation Machine

B. Stage Trial and Error

At this stage, the researchers conducted several experiments with a test against the equipment.

a. First try

Researchers design a serrated blade (triangular teeth).

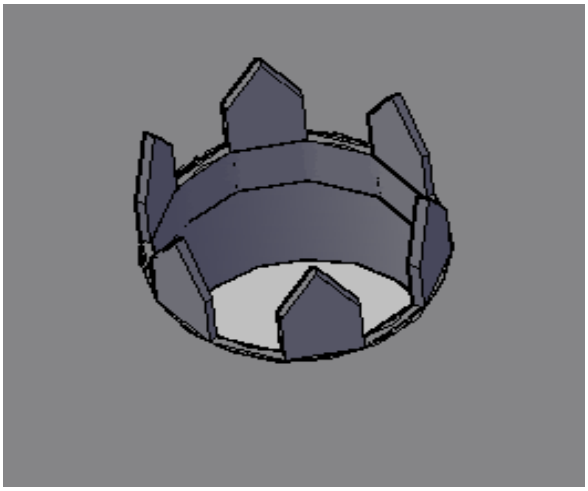

Figure 5 Eyes First Trial Design Jagged Blade

From these results, in a small get maize yields will leave a mark that has not been separately silks corn.

b. Second trial

Researchers designed the knife by adding at the outlet with iron Plus (+).

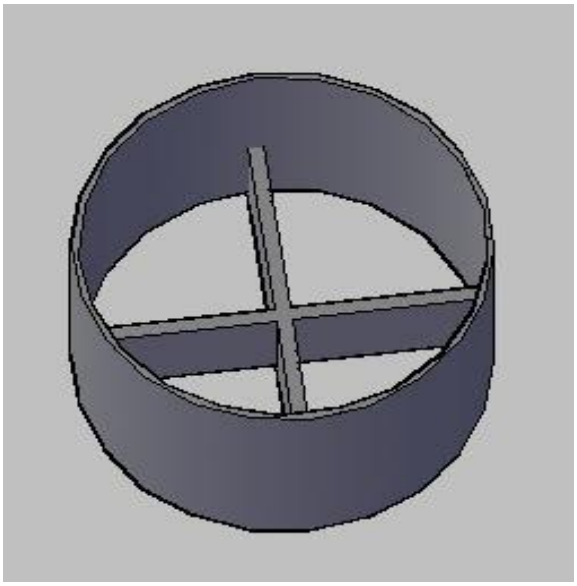

Figure 6 Design of Experiments Both Eyes Knives Plus (+)

From the results obtained unsatisfactory results, which were originally designed split maize (corn head) turned in results that they got on experimental corn head cannot be divided optimally and even hinder output knob entirely.

c. Third trial

In the third experiment, the researchers let go of the iron (+) which had been installed and also release the blade teeth that have been installed, with a dull knife.

Figure 7 Experimental Design Third Eye Knife without cam latches and Plus (+)

This experiment showed more effective because corn yields obtained better and as expected.

C. Phase Socialization

At this stage the implementation was conducted in Hamlet Sebero, Prupuh Village, and District Panceng. On March 2, 2019 at 19:00 until finished.

Residents described on how to manufacture tools and mechanisms of the tool.

D. Stage Practice

This phase is done in front of the participants of socialization that comes along with the father of the hamlet devices are present on the spot.

Practice is done directly by the student service learning Odd Thematic Group 6 program Industrial Engineering University of Muhammadiyah Gresik and provides the opportunity for some residents to practice directly also on how these tools work.

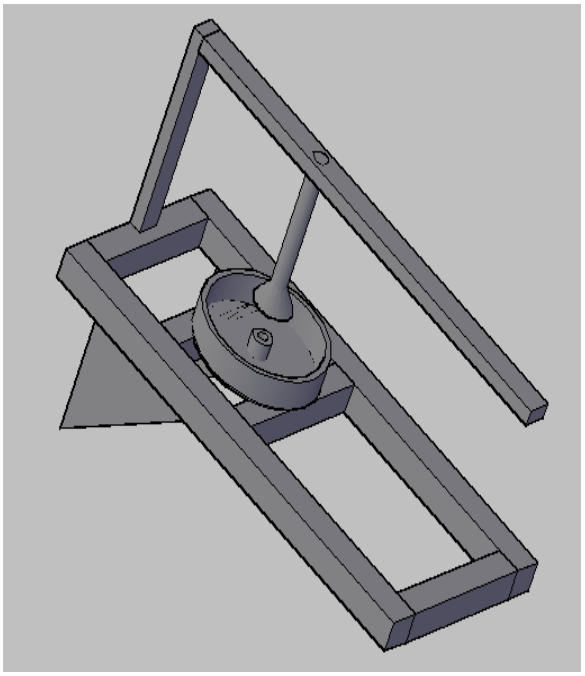

Figure 8 Removal Tool Corn Seed Corn Transformation Machine

E. Phase Monitoring and Evaluation

On March 16 2019 monitoring and evaluation carried out directly by means of interviews and questionnaires to the residents who are directly involved.

F. Achievements

Residents feel greatly helped by the presence of the corn thresher tool.

Conclusion

In this case after socialization and actual experiments together with the residents get the result that the usual maize thresher time 5 minutes to 30 seconds. Increasing the productivity of the people who can resolve the threshing corn with a short time and the quantity of maize which is a lot.

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