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A NEW LOG LOADING METHOD BY PORTABLE WINCH AND POLYETHYLENE CHUTES

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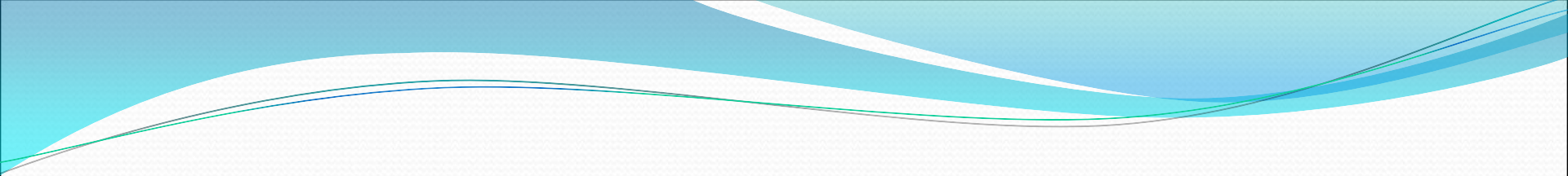
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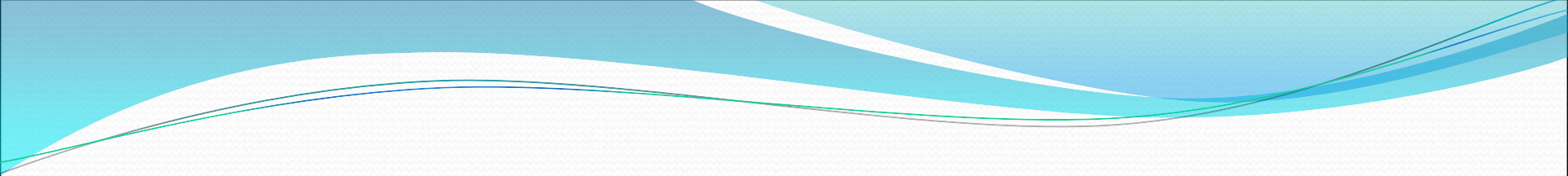
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INTRODUCTION

- Forestry General Directory's (FGD) annual wood production of about 20 million m³ of industrial wood is carried out as 10 million stere of firewood (Kaplan, 2007).
- FGD 65% of the demand for industrial wood raw material market in Turkey at least 90% of income for the company are covered by forests is provided in this way (DPT, 2001).
- Forest management in Turkey, the annual average of US dollars 2 billion revolving fund is a big industry.

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- Also constitute more than 30% of the budget goes to the production of wood raw material among the very expensive activities (FGD, 2006).
 - In Turkey, the power structure and an expensive truck loading work in the forest, which occupies an important place in the production of wood working.
 - Generally, this installer manpower or loading work carried out with the machine power is expensive and risky operation.

- In Turkey, it is produced at least 50 million timber per 1 year.
- These logs are made to perform the loading process approximately 1 million times to store the truck after being transported to the edge of the forest road in the forest.
- The wood raw material is removed from the chamber to the edge of the forest road and heavy products in particular should be transferred to the storage timber attribute loaded soon.

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- In this way both to prevent loss of quality of both products is not compromised modified work flow in the forest.
 - Failure to hold the truck as the installer is essential not to be kept.
 - Not much wood production areas in a particular region, the installer is not used due to lack of economic and forced to go to work manually install.
 - In such cases, the use of cranes can be profitable solution.

A NEW LOG LOADING METHOD ON THE FOREST ROAD

- Used crane, used under study is PCW5000 brand is capable of shooting up to 100 m from the cable (Figure 1).



Portable cranes and fixed state tree setup

- When using dual traction rope can be doubled. PCW5000 price of cranes is around 3000 euros.

Motor	Honda GXH-50cc
Maximum Pulling Power	Single rope: 1 tonne Double rope: 2 tonnes
Weight	16 kg
Motor	Four-stroke engine (Honda GXH-50cc)
Motor oil reservoir	0,25 Liter SAE 10W-30 API SJ Engine Oil
Petroleum reservoir	1,2 Liter
Petroleum type	Unleaded fuel
Petroleum consuming	340g/kwh
Maximum working range	1,5 Hours
Maximum pulling speed	85mm drum: 18 mt/min (1080 mt/hr) 57mm drum: 12 mt/min (720 mt/hr)
Demansions	33cm x 38cm x 36cm
Used rope diameter	10mm – 16mm range
Suggested rope diameter	12mm-13mm range

- As the operating principle, one end of timber wrapped round the other end of the drum 3-4 rotates with the drum with waste wound the rope pulling operation of the motor as a result of timber shrinkage is carried out.
- To speed up the shot, adjust the motor to stop or reverse the negative cases at the end of the draft work-stopping device are available.
- The chute system made of polyethylene material (Corrugated Chute SN4) in the study route has been created using artificial skidding.

- Polyethylene tubing is manufactured from low density materials, crushing, tearing and resistant to external influences such as shock.

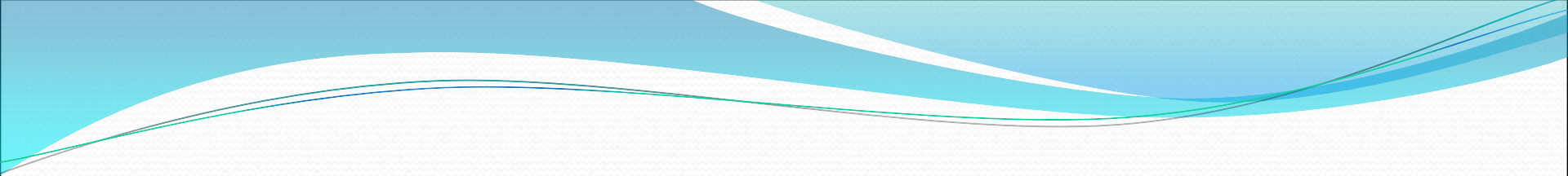
Chute Features	
Chute shape	Half circle (U)
Chute material	SN4 Polyethylene
Chute diameter (mm)	500
Chute thickness (mm)	4
Chute length (mt)	7
Chute weight (kg)	16

- Plastic chutes (SN4 Corrugated Chute) is split in half longitudinally after obtaining full circle.
- It is then used to create the artificial route moved to the production area by two workers in the forest.
- Matched by the male-female heads of skidding direction of the artificial hill sloping terrain 3-5 on the road route forest mounted to each other with a smooth oval screw formed into the trucks.

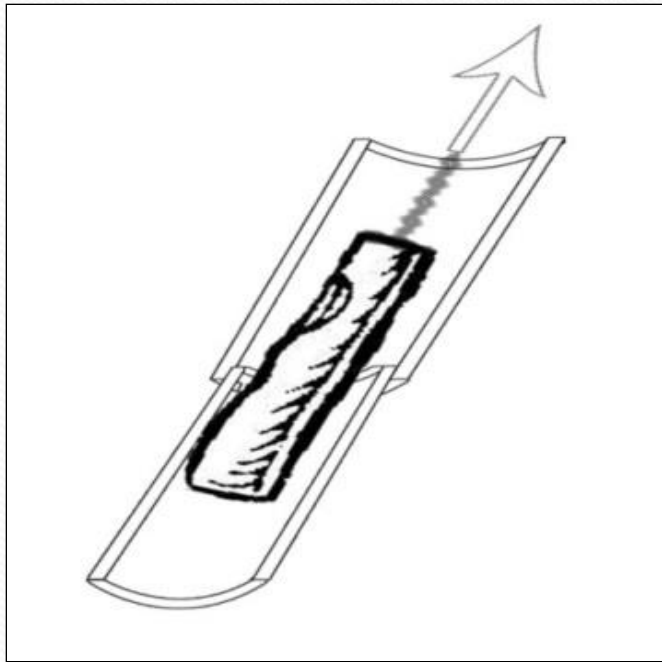
- Thus, the insertion chutes of the timber during transport to the joints by pulling up is prevented.



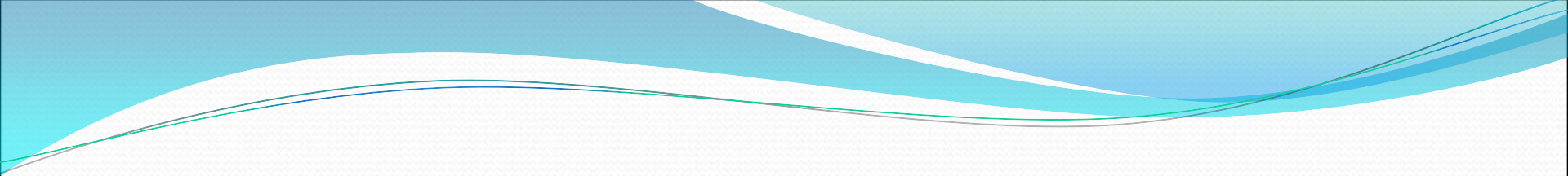
- Synthetic route is arranged if necessary qualities can be stabilized in different ways.
- This synthetic route in the chute system has a modular structure capable of assembly and disassembly has been carried out in a very short time like 1-2 hours.
- The main components used in the controlled withdrawal system with manual winch truck chassis shifted upward in an artificial plastic timber transportation route created from polyethylene chute; chute route, 10 - 12 mm in diameter and portable hand winch rope can form listed.

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- In this method, plastic the longitudinal slope of the artificial route consists of chute ranged between 20% and 25%.
 - During loading of the transport direction of the connection ends of the plastic chutes positioned to be a rough oval hill together with screws were inserted into the right place to be installed by the truck chassis.

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- Transport system, in the woods or on the edge of the forest road that was carried out in the form of a portable hand winch winding drum on the winch rope connected to the timber using engine power.

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- Repeated time measurement method to determine the yield of the time study hours required during loading (reset) technique was used.
 - In controlled shooting time measurements in the chute, timber truck loading operation encountered during the experiment were performed.
 - Here, the average value obtained in the absence of a sufficient number of measurements are made for various reasons only efficiency and speed calculation.



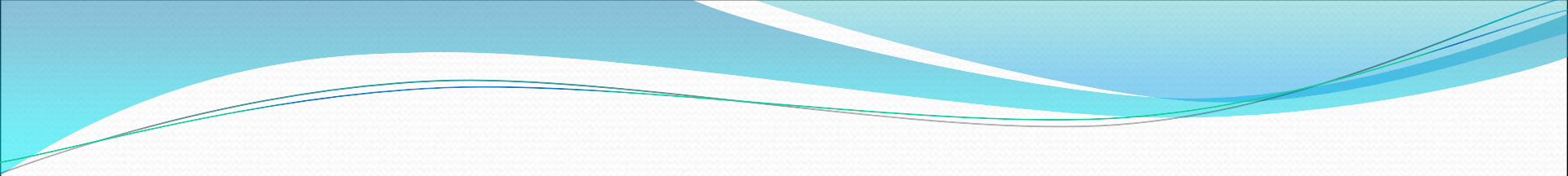
CONCLUSION

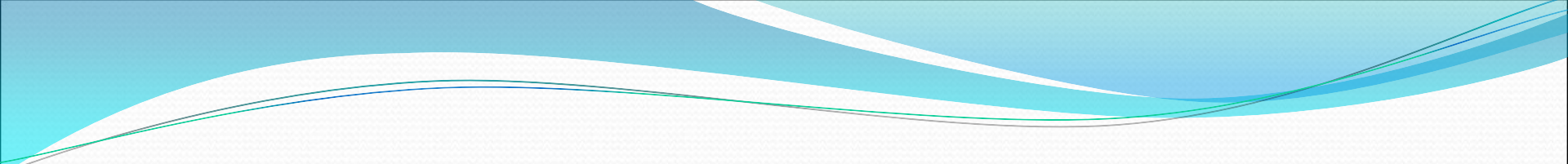
- Turkey; synthetic rope cranes movable with integrated chutes after the first time carried out using the system controlled truck loading applications pulling evaluated.
- Hand winch with a chute in the chute combination of slope ranged between 20-25%.
- Each cycle pieces peeled spruce in a timber is being loaded onto trucks pulling a pick up time was measured as 67% of the total time of 161.8 seconds is the length of time.

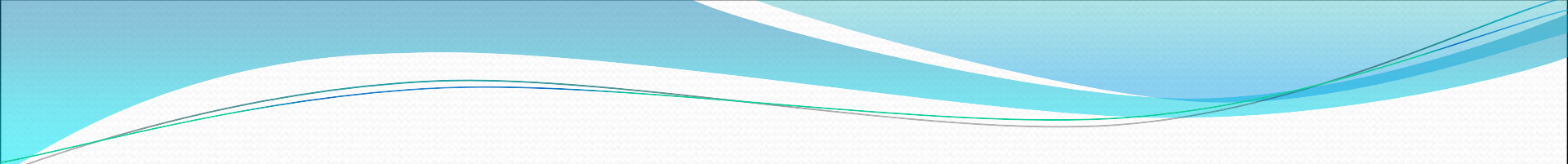
- Average speed and efficiency nearly values obtained.
- Up the slope controlled shooting at an average speed of 1 km / h is particularly affected by the volume difference in friction chute route.
- Total transportation time on the right above the timber-controlled withdrawal period has occupied an important place (Acar 2016).

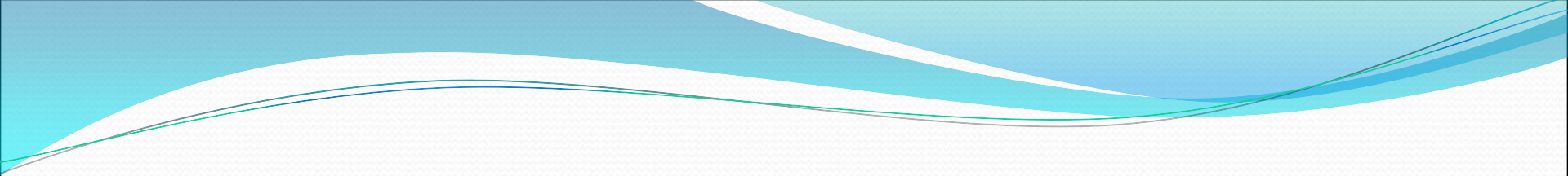
➤ Some of the benefits of the preferred choices for the loading of the portable cranes are listed at belows.

- * Portable winch and chutes can be moved easily by workers
- * Setting is easy
- * To be economic due to low fuel consumption
- * High efficiency of the loading work in small scale
- * To be ergonomic
- * Because of the existing of distributor in our country, it can be easily obtained.

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- To facilitate the work in the timber loading done in forestry activities can be increased efficiency in the forestry sector, the reduction in the number and severity of occupational accidents, portable and development by evaluating the economic system, such as hand winch in terms of ensuring time savings in the realization of the work is required.
 - Portable winch in price could supply of forest workers, efficient and portable system that can be used for multiple purposes.

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- This winch, and never run out of time to work for workers and so will eliminate the risk of interruption. Moreover, we also ensure timely completion of the employer's business plan without a hitch. This form is an ergonomic system as well as economic.
 - Considering the challenges of development work in the timber loading vehicles and methods in forestry, common and may be recycled to develop this kind of chute system and manual winch combination of work and has been important to put into practice.

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- Heavy timber products in the characteristic moved to the edge of forest roads should be transferred to the warehouse loading as soon as possible.
 - In this way both to prevent loss of quality of both products is not compromised modified workflow in the forest.
 - Failure to hold the truck as well as the installer should not be allowed to stand.
 - High amounts of non-wood production areas, the installer is unable to get used to the lack of economic and forced manual loading business.

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- In such cases, the use of cranes can be profitable solution.
 - Developed with this combined system, portable cranes practical, portable and loading of timber lost time from work, although not cheap, and it is thought to be reduced to a minimum the risk of accidents at work. Side of the road in the forest where no profitable or not the supply of heavy plow use, loading trucks and heavy industrial wood logs can be carried out easily with this system as developed.



Thanks for your attention

