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## **MANAGING OCCUPATIONAL HEALTH AND SAFETY IN AGRICULTURAL MACHINERY INDUSTRY IN TURKEY**

**Abstract:** *The agricultural machinery industry is a high health risk occupation. Companies should implement occupational health and safety management rules and regulations. These companies face a rapidly booming agricultural machinery sector and need the help of occupational health and safety management to achieve business goals. Being aware of the influential factors on the occupational health and safety management is needed to reduce work-related fatalities and increase the company's efficiency. Few studies identifying the influential factors on the implementation of occupational health and safety management in the agricultural machinery industry are available. This study provides a general overview of occupational health and safety management and investigates the relationship between five factors influencing the implementation of occupational health and safety management among currently operational agricultural machinery companies.*

**Keywords:** *Healthy, safety, agricultural, machinery, industry*

### **1. INTRODUCTION**

Agricultural production made with primitive methods and used human and animal powers in years before pre-republic. Power reform did not have important effects on Turkey's agriculture that happened in Europe and USA in the end of 19th century. In the second half of that century, limited efforts made and so firstly decided to bring some machines from overseas as a precaution. In Balkan war and following years, some energy machines and caterpillars imported from Germany by Ministry of Agriculture to support workforce that lowered. With animal drawn plough fabrication, small scale agricultural implement fabrication has started in 1930's.

First official statistics made about agricultural machinery in Turkey in 1936. This counting shows that the tractor number is 1.308. With the help of Marshall support program in 1949, that year number was 11.729 and it increased to 31.143 in 1952. But some disadvantages happened like brand and model multitude because of mechanization hadn't regulated properly. In the frame of American backing in 1954-55, plane production and maintenance factory that founded by atatürk in

Gazi/Ankara closed, and Turkish Tractor factory that performs tractor assembly founded instead. Domestic support rate increased to 43% in 1961. Demand to agricultural machine fulfilled with importation since 60s. Assumption that Turkey progress with agriculture started to lose validity from 1963, but the fact that agriculture develops with industry sector thought approved its truthness. Those things clearly determined; cities can not be fed without sufficient agricultural production and performance will not be increased without applying high technology to soil. It is observed that our farmers have will to do conscious modern agriculture and increase demand of tractor, agricultural machines, artificial fertilizer and irrigation. Because of current conditions hasn't developed, sub industry's inability, low farmer purchasing power, lack of capital, production on demand, cheap and simple agricultural machines's production happened in 70s that doesn't need high technology, replace hard work labour force, can perform discrete operations.

Experiment report imposed obligation to manufacturer and importers who want to sell farmers agricultural machines with government agricultural credit support in the end of 70s. This

test that for determining suitability of agriculture technic and current standarts, also brought a certain discipline and minimal standarts with it.

With the help of these tests, new various steps took behalf university-industry collaboration, and also perform works behalf machine improving more in test stage. The sector developed its technologic infrastructure in 90s and because of fluctuation in domestic market, it slowly begin to face export.

As a result of this tendency, export increased 10 times since 2000. Because of export obligates quality and technology, respectable amount of development observed in engineering.

With the beginning of institutionalization, management method started to change from family to Professional. Now most of mechanization tools that sector needs are producing.

And also almost all agricultural mechanization tools are producing in our country and exporting except harvester, bundle, self propelled silage and cotton harvest machine that produced for companies's capacity and models and needs large parcels and non rational or compose things that based on know-hows.

If we look at Turkey's agriculture profile, vegetative production made in 23,9 hectare area, this area includes 83,5% field plants but just 13% orcharding. [1]. Field agriculture and especially dry agriculture survive with supports in our country.

Field agriculture's socio-economic importance increases performance's importance. Establishments number 2011 says that about 3 million agriculture business exists in Turkey and according to 2014 year Farmer Register System, 2,2 Million agriculture business exists.

**Table 1 Agriculture areas and number of farmers in Turkey [1]**

Year s	Area (decare)	Number of Farmer	Avg. Business Size
201	153.	2.214.	69,3
201	147.	2.183.	67,5
201	149.	2.206.	67,6

**2. OCCUPATIONAL HEALTH AND SAFETY**

Various law and regulations made since Ottoman Empire period as parallel to the developments in our country. Our relation with International Labour Organization ILO based on 1927 but works starting to done with membership title in 1932.

Different definitions are exist about occupational health and safety. One of these is approved by Republic of Turkey which writes in 161st ILO contract; Occupational Health Services term constitutively has preventive operations and defined services that in the level of providing the most suitable physical and mental health to employer, employees and their agents, create safe and healthy work environment and adapt the environment to their skills and the responsibility of give advice about these.

Working accidents are important problems in our country like rest of the world. Losses becuse working accidents should be common problem of all countries and can be significantly lowered with taking needed and sufficient precautions. According to Social Security Institution's statistics, 221.336 in 2014, 191.389 in 2012, 74.871 in 2012, 69.227 in 2011, 62.903 in 2010 working accident happened and just in last five years, 6.874 employees past away (SGK, 2016). Direct and indirect costs that caused by working accidents and occupational diseases in Turkey created significant financial burden on our country's economy.

When working accidents analyzed as sectoral, metal sector comes first. To lower working accidents, current risks must be rightly detected and analyzed. According to Occupational Health and Safety Law that numbered 6331 and become valid with publishing in Official Newspaper in 30 June 2012 and numbered 28339, all work places obligated to risk assessment.

There are lots of different definitions of risk but this one is the clearest one; determining dangers that existing or can happen from outside, grading these dangers with factors that can cause this as risk and risks originated by these dangers analysis and required works for purpose of determining control precautions.

There are lots of risk evaluating technic exist nowadays. Risk evaluating technics can be gathered as two major group in terms of risks,

risks actualization possibilities and guessing possible effects. These are, qualitative and quantitative methods [2].

According to “Regulation About Definition, Legibility and Classification of Small and Medium Size Businesses” that become valid as publishing in Official Newspaper numbered 790 in 04.11.2012, definition of SME in Turkey, businesses which employ 10-250 employee and annual revenue between 1-40 million Turkish Liras called SME.

According to 2013 datas in Turkey, SME’s constitute 99,8 of total enterprise, 74,2 of employment, 54,7 of salary and price, 63,8% of endorsement, 52,8% of added value with factor cost and 53,3% of material goods related gross investments. [3].

This study’s purpose is try to reveal the situation from the point of work health and safety in metal sector and equipment manufacturing, in other words, sector of agricultural machine manufacturing in Turkey.

For this purpose, tried to start gathering datas about working accidents, especially SSI datas. It is helpful to consider that SSI datas will not show the right informations about working accidents and occupational diseases because of the institution only has datas of active insured ones.

But yet it is still the only place that this kind of datas can gathered in Turkey. About 28 nace coded machine and equipment production, 122.291 men, 18.843 women total 141.134 people work in 9.933 work place includes agricultural machine producers according to January 2016 datas. (SSI, 2016)

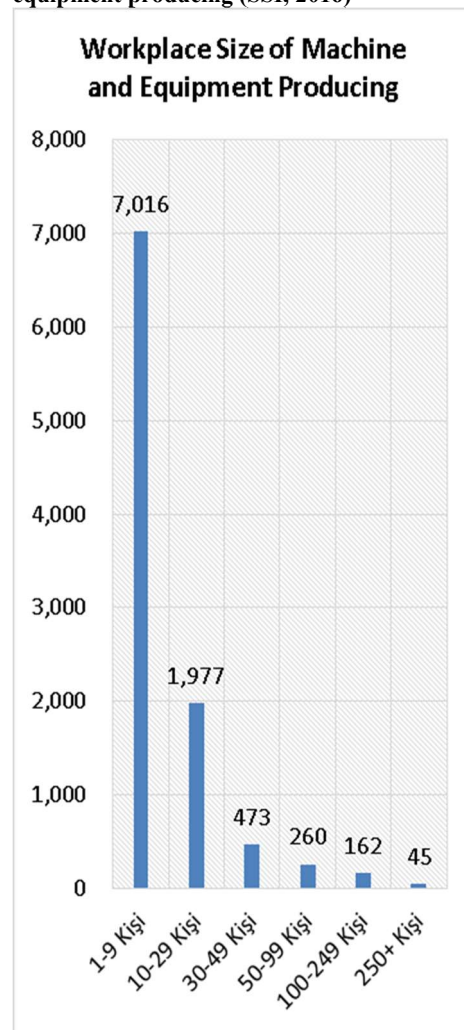
When we analyze businesses that produce machine and equipment as their sizes, we see that 1-9 people work in 7.046. When we add businesses which employ 10-29 people, we see that 91% business are small scaled

Shows more homogeneous range when looked number of employees in businesses as sizes. 91% businesses which employ 1-29 employees employs 40% of total employees in the sector. As we can see from the number of small scaled businesses are significantly large, so controlling occupational health and safety precautions are gain importance.

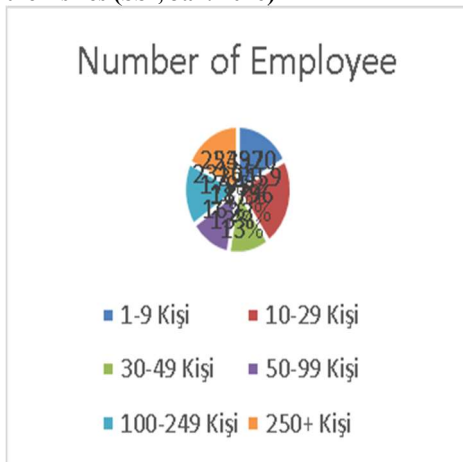
Sufficient information cannot be found about sufficiency of work precautions in developed and developing countries. Most common criterion that determining sufficiency of work inspections is the amount of active

population per inspector. According to ILO, these ratios should be; 10 thousand per inspector for developed market economies, 20 thousand per inspector for economies in transition, 40 thousand per inspector for underdeveloped countries [4]. In developed EU countries, less than 10 thousand employees per inspector, but also in France and Czech Republic less than 20 thousand, in USA 70 thousand, in Mexico 140 thousand, Brazil and Argentina 25 thousand and China about 20 thousand. And in Asia and Africa countries, it has large quantities [5].

**Table 2 Workplace size of Machine and equipment producing (SSI, 2016)**



**Table 3 Number of Employees that Works in machinery and equipment manufacturing as their sizes (SSI, Jan. 2016)**



In last years, number of inspector significantly increased in Turkey. Correspondingly, the number of employees per inspector lowered under 40 thousand after 2010. According to Work Inspectorate's last publish, number of inspector in March 2013. According to household workforce survey, number of active employee is 25.262.000 in December 2013. Accordingly, 24.059 employee for per inspector in 2013. Maybe Turkey shows improvement about number of inspector, level of inspection and number of inspectors are not in sufficient level yet [6].

### 3. CONCLUSION

As a result, occupational health and safety still in infancy stage in Turkey. Occupational health and safety shouldn't be obligated just for legal necessity, it should be considered as protecting individual's the most sacred thing, life, and as rules and working culture. Because of this, beside present laws about occupational health and safety and keep up to date with regulations, it is also important to conduct inspections.

In the context of reconstruction, employers who has small and medium businesses get rid of the responsibilities of legal regulations because of their small number of employees. Although short term obligation brought to these

businesses after related regulations as danger classification, it is impossible to say that services are sufficient as presented time and quality.

These services be seen just employ occupational safety specialist and workplace doctor, and actualize as making expertness contracts, hurriedly preparing risk evaluating reports and immediate action plans and filing education participation documents. Most of business doesn't do these as practice, they do just for avoiding legal sanctions. These subsidiary services that government can't do completely by itself, unfortunately became market that just about document trading. So, legal limit 50 employee should be abolished by SME occupational health and safety committee. Occupational safety specialist employment obligation should be brought abide by business size and working environment risks and working conditions should regulate with different regulation. Committees of worker health and work safety that established in businesses should be regulate as democratic foundations and should have sanction power instead giving advices.

All employees should have voice and decision in businesses about working health and safety. Working place, technology, raw material that using in production, product, ergonomics etc subjects should be planned in project stage and study.

In last years a significant increase occurred about employment, insured worker and number of business in Turkey. When calculate employment and number of employee, maybe accident ratio seen get lower, but when accidents and accidental deaths number stay same, this shouldn't be acceptable situation. "Zero accident" approach should be adopted like developed countries do. If preventive system established and apply rightly, even employment increase, accidents will get lower. At this point, work inspectors efficiency must be investigated. Number of work inspectors is not sufficient if we compare increasing employment and number of businesses. In this Section, the modeling procedure of uncertainties that exist in the developed model is described.

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