

# **Ergonomics and occupational health in sugar industry of Pakistan**

*By*

**Engr. Muhammad Adeel Ashraf**

B.Sc. Agri. Engg. (U.A.F)

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\_\_\_\_\_  
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\_\_\_\_\_  
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MEMBER:

\_\_\_\_\_  
**(Prof. Dr. Muhammad Inayat Khan)**



**DEDICATION**

To

***My loving and great parents***

*By virtue of whose prayers,*

*I have been able to reach this position,*

*And whose hands are always raised for pray,*

*For my well being, even at this moment of time,*

*And under whose feet my heaven lies.*



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## **Abstract**

Ergonomics is a science of designing user interaction with equipment and workplaces to fit the user. The introduction of hazardous technologies in industry and agriculture has resulted in high accident rates, occupational diseases, and unhealthy working environments. Proper ergonomic design is necessary to prevent repetitive strain injuries, which can develop over time and may lead to long-term disability. The present research was conducted on sugar industry of Pakistan to analyze the ergonomics and occupational health status. There were frequent injuries and accidents in sugar industries but a little work had been done on ergonomics and occupational health of workers. For this purpose, questionnaires were prepared and surveys of different sugar industries were conducted to gather both qualitative and quantitative data. The data was covered all the sections of the sugar mills viz. cane handling units, cane preparatory units, mills house, boiler house, process house, power house and workshop etc. The research was not only focused on ergonomic and occupation health study but also included the suggestion and modification in the existing design to work at safe working level. Instruments like sound meter, pH meter, Hardness test kit, CO and O<sub>2</sub> detector etc were also employed to conduct data regarding ergonomics and occupational health. During survey of sugar industries it was seen that in sugar industries of Pakistan average 15% to 20% workers were injured in every industry in each year at their workstations. It was also observed that the average 40% workers were equipped with safety measures while remaining workers worked without safety equipments, the average 30% to 40% workers were trained and remaining workers had no training and education about the machinery operation and very poor working condition existed for the workers. It was observed in sugar mills average 50% to 60% machines were working well but they needed preventive maintenance during operation and 10% machines had completed their life span. In sugar mills average 85 to 112 dB noise levels were exposed by the machines that were the key causes of human mistakes leading to increase accident rate. The practical concern of this thesis was to improve the design of the workstation as well as to improve a worker's safe manipulation of tools and equipment and control of machinery.