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Better Work Environment for Small Scale Industries in Developing Countries

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ABSTRACT

I would like to highlight the problems of industrial workers regarding work environment in small scale industries, particularly in developing countries, because it is one of the major problem regarding their efficiency. Better work environment is required for reducing workplace health hazards, stress and increasing safety/security. This results in good quality productions with minimum faults and also minimizes wastages.

The need of the human performer is often overlooked in the design of manufacturing environment. So designers should carry out research regarding better work environment. With this, a valuable contribution to the work environment can be achieved. There are many factors to improve the work environment. Very common factors, which should be given prime importance, are: Workspace arrangement; Maintenance; Light, Color, Light with color, Glare; Temperature, Humidity, Ventilation; Noise; Safety and security.

Keywords : Work environment for workers

Introduction

Main motive of owners or the management of any industry is to increase the production. Some action plans to increase the efficiency of the workers for improving the productivity has already been taken, like – financial incentives, medical facilities including first aid centre, welfare cell, training, skill recognition etc. But still today, especially in small scale industries, very little thoughts are given for better work environment. Owners or the management have now started feeling that workers should be given proper work environment to increase their efficiency. This helps in increasing quality productions. It has been seen that quality production occurs when people perform tasks more accurately, faster, without fear/tension and work for a longer time without getting tired with good health. This is possible only when one gets a better work environment.

Work Environment

Maximum affected are the informal sectors and small scale industries due to lack of functional linkage between different spaces; lack of maintenance; lack of visual environment.; also they suffers adverse health impacts due to exposures to dust, heat stress, toxic substances, noise, vibration, glare, poor hygiene, safety and security etc. All these affect productivity. Many factors can be considered for better work environment, the most common factors are discussed below:

1. Proper arrangements

In the layout, there are many areas like:

- Manufacturing area,
- Storage area for both raw materials and finished products,
- Other areas like:

i) Office/Management ii) R & D cell iii) Restroom iv) Eating space v) Canteen or Cafeteria vi) Locker room vii) Washrooms viii) Toilets ix) Showers x) Changing room xi) Crèche etc.

They should have proper functional linkage. This will help comfortable and easy movement of activities including material handling process. This will reduce waste of production time, which are paid but not realized.

The workplace becomes totally unsafe for overcrowding due

to machineries, equipments, raw-materials, finished products, furniture etc. It can increase health and accident risks including stress.

Materials and tools should be so arranged so that it is within the easy reach of the workers and with least possible disturbance. There should be comfortable eye movement without change of focus or without turning the head. They should be pre positioned to avoid searching.

There should be proper relationship between the seat and the working surface. Study of body postures in relation to the machines, tools and equipment are important. They should be designed keeping in view the ergonomics.

Even if the work is done standing, there should be provision for sitting because standing for a long time is a common source of discomfort and fatigue.

2. Maintenance

Maintenance is very important in workplace for e.g. choice of materials, accumulation of dust in floors, walls, lighting fixtures, glazing etc. Due to poor maintenance there may be stress/strain, light loss, accidents, wastages etc. Poor maintenance also invites fire hazards.

3. Luminous Environment including color

Designers should think of proper lighting in workplace because it increases pleasing visual atmosphere and hence develops interest and mood for working and moreover accuracy increases, while time to perform decreases.

It also reduces stress, eye strain, headache, etc. Proper lighting increases safety, contrast and reduces accidents, waste/reject rates and damages.

Both day-light and artificial light should be considered because apart from good lighting, it has been observed that workers desire windows. Moreover government is also considering energy efficiency.

Proper lighting also reduces glare. It affects productivity because glare causes disturbance.

Apart from as stated above, color and proper lighting with

color also helps in giving contrasts, special attention to special areas (e.g. near the moving parts of machineries, near level changes, electrical equipment, any places which give rise to danger). Color also helps to achieve required amount of light. Color is also used to distinguish certain features (e.g. machineries, pipes etc.).

All these will help in increasing the productivity.

4. Temperature, Humidity, Ventilation and Dust

Besides illumination productivity is also affected by unsatisfactory thermal conditions, uncomfortable humidity and bad ventilation etc. Too humid, too much dry leads to loss of concentration, irritability, tiredness, discomfort, heat stress, respiratory problem, fatigue etc. General picture of the small-scale industry is the cramped interiors, which do not allow air to circulate freely resulting in concentration of indoor pollutants. The problem becomes more acute in summer and monsoon as dehumidifiers are generally not used. As a result mould and bacteria formation can lead to asthma and other chronic illness.

Some factories require high relative humidity for manufacturing (e.g. textile factory/mills requires high relative humidity for good weaving because it has been seen that warp or the yarn breakage rate falls as relative humidity increases.). In this type of industries both manufacturing and worker's environment should be considered.

Consideration of materials used in building construction (e.g. roofs, walls windows, glass etc.) is important because it is linked with thermal conductivity

Inhalation of dust gives rise to occupational lung diseases. Proper ventilation, room air filter, cleaning system, dust collector etc. should be provided. Blown and air exhaust ventilation system are effective where large volume of fumes, gases, vapors and dusts are emitted.

6. Noise

Due to noise there may be temporary or permanent hearing loss; acoustic trauma etc Noise not only damages hearing sensitivity but can also give rise to tinnitus, which is very disturbing. All these give rise to stress, lack of concentration, circulatory problem, digestive problem, psychological disturbance, blood pressure, breathing trouble, nervousness, sleeplessness etc.

Noise also gives rise to safety hazards. For example noise interfere speech communication leading to errors. There may be errors and accidents due to failure of responding to audible warning system.

Use of hearing protectors is also not the ultimate solution because removing the hearing protectors for a short period of time can lead to hazard. Also hearing protectors can interfere with verbal communication

All these influences productivity, occupational health, safety etc. Noise level must be maintained and continuous exposure to noise should be avoided.

6. Safety and security

6.a Fire:

Fire precaution measures should be taken to minimize the risk of fire spreading, avoiding danger to persons and property. So the design of factory should confirm with the statutory requirements for safety of life and the property with factory rules as well as with the requirements of the client's insurer. Apart from factory rules, a continuous dialogue between the client's production team, the insurer and the fire officer is very important. The design should also include identifying the potential hazard areas including fire detection and alarms.

6.b Signage/warning, and Identification:

All signage /warnings (e.g. safety signs, safety symbols, safety warnings or safety posters) should be in prominent location. The use of color and color with light is important from the point of view of identifying dangerous areas, escape routes, emphasizing working and circulation zones and for identifying areas which require a greater level of care to be taken by operatives.

6.c Safe detailing:

Use of right materials in building design is very important from the point of view of easy maintenance, comfortable working environment, accidents etc Use of wrong materials may cause accidents like – slipping, tripping, stumbling, and falling etc.

6.d Security:

The designer should think of the total security system including entry/exit, fencing, gate/s, watchman booth/towers, security guard room/s, area lighting, theft, emergency alarm/s etc.

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