Efficiency and Productivity

summary
visits of ESGE–experts
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General definition productivity/efficiency

Production efficiency is a term used to describe the state of level at which a business is producing the greatest numbers of units while utilizing the least amount of resources possible. The idea is to achieve a balance between use and production without decreasing the quality of the products that are manufactured.
Production is inevitably linked to efficiency. The more efficient a industry/company is, the more it can produce. The result is to make profit that reflects the company’s efficiency. The increased production can, in turn, lead to the possible re-investing. The company may buy more equipment, modernise the current equipment in order to secure it’s competitiveness against other competitors.
Efficiency and productivity in garment industry

Early studies used ratios as number of garments per sewing machine or number of garments per operator to evaluate productivity in garment industry. Actually these ratios can`t reflect the overall performance of a garment–company.
To control the productivity/efficiency level of a textile company ESGE suggests to analyze the following areas:

1) worker/labour productivity
2) equipment productivity
3) resource productivity
Integration of different parts to optimize global productivity

- Equipment (machinery)
- Resources (material + energy)
- Worker/labour
Worker/labour productivity

As textile-industry is mainly labour orientated and the degree of automisation/instrumentation is compared with other industries considerably low, the influence of an improvement in worker/labour productivity is quite high.
Worker/labour productivity

The efficiency of worker/labor productivity depend beside others on following point:

* skilled and semiskilled workers experience and training
* management experience and training
* flexible and willing workforce
* good working conditions to secure worker’s health and safety
* proper production settings to ensure smooth production flow
* proper manpower planning to avoid expensive gaps in production
Worker/labour productivity

According the ESGE experiences there are quite a lot of improvements possible to achieve a remarkable increase in worker / labour productivity. We recommend to concentrate in the first stage to following topics:

* improvement in production–planning and production–control, if necessary by using special software provided by ESGE. Additional costs like up charge for air–transport due to late delivery or low degree of capacity utilisation will not accure respectively costs will be quite lower. Due to better planning instruments producer might be able to take additional orders from customer.
* **Change payment system** to a system which is more motivating for a good performance, quantity- and quality-wise. We recommend to implement in cutting, sewing and packing department a basic salary which is granted and to pay a premium which is in **direct relation to the performance** of the individual worker.

We don`t recommend a strict piece-payment, we recommend a premium-payment on basis of calculated working-minutes per operating sequence in work-flow. By having a high share of the performance-premium, the worker`s interest in improving is intensive.

Important is a fair and transparent use of this system, the workers must have the opportunity to compare each other. Productivity ratio and premium salary should be monthly posted, visible for everybody.
* Installation of training sections and intensive educating of the new employed person.
* To be flexible in production, training of some persons as multitasking–workers. For example a share of 25% of sewers should also be able to work alternatively with other sewing machines. As products and corresponding workflow are often changing in textile–production this flexibility is essential and ensures smooth production.
* Proper maintenance of machinery (see equipment productivity)
* Showing “distinctive competence”

To compete and survive in worldwide competition, it’s necessary that the producer is specializing on a certain product range. By doing so, the factory and workers get more experienced in this special product-range and can easier improve productivity and optimize the quality level.
Worker/labour productivity

The possible use of ESGE–Software helps to administrate all the necessary data and to receive the necessary data in overview.

This ensures:

- data for correct and fair payment
- analysis and data for future production–planning and production–control.
- data for manpower planning and machine–investment–planning
Equipment productivity

Actual situation:
* The average age of the sewing–machines and all the other equipments is quite high.
* The organisation for maintenance of sewing–machines and other equipment is not developed, there is no possibility, respectively no interest, in dedecting a possible problem before the machine breakdown or machine malfunction.
* The mechanics are not trained and basic knowledge is missing
* Due to financial situation no possibilities to invest in new machines.
ESGE suggestion:

* By installing and using special add. parts at the sewing machine, productivity and quality can be easily improved, even only with a small investment.
* Modifications of existing production equipment and utilities, for instance by the addition of measurement- and controlling-devices.
* Need to organize respectively install mechanic/maintenance department. Permanent control and maintenance of all the machines to avoid machinery-deterioration.

The above mentioned points also supports to achieve targets within enviorment-protection , safety at work and quality of product.
Resource productivity is usually separated into productivity material and productivity energy.
Definition:
Resource productivity /efficiency means using limited resources in a sustainable manner while minimizing impact on environment.
Resource productivity

Productivity in material:

This defines the usage of raw-material and accessories which is used for the production incl. taking care of quality

* resource productivity in cutting, use of fabric during cutting-process

* resource productivity in sewing
Productivity in cutting

**Impression ESGE:**

- the general wastage of fabric during the cutting of the fabric is relatively low. There might be less wastage in future when companies use automatic cutters, at the moment this is not realistic due to the high investment costs.

- the main problem in cutting seems to be that the quality issue during cutting is not or only less considered. The effect respectively the consequence is that this causes various problems in the following work–process (high second quality percentage, additional rework–time, etc.)
Productivity in cutting

**Impression ESGE**

- basic knowledge of the cutting workforce is missing. The workers and the supervisors in cutting department don`t know what problems they are causing due to their low performance.
- Missing maintenance even for small equipments cause negative results
Productivity in sewing

*Impression ESGE:*
general low quality level with high quantity of rework pieces and rejection rate,

*Recommend by ESGE for cutting and sewing*
- installation of several quality assurance stages
  * clean surrounding of storage areas, work places and machine maintenance
  * box–move during production proceeding to protect from dirt/dust, especially recommended for bright colored garments.
* proper production setting for smooth production flow, according to procedure sequences.
**Recommend by ESGE for cutting and sewing**

* proper manpower planning according to department productivity to avoid gaps in production procedure and the unnecessarily need of moving the goods to several places.

* Intensive quality-checking in the lines to detect defects at the spot.

* Installation of training sector to ensure proper education and consequently lesser quality defect.

* Multitask workers for flexible settlement in various departments.
clean and accurate preparation in pre-production stages (see cutting)

* Realistic target planning, too high expectations and pressure can cause improper results

* Fair and polite treat towards workers, long-term worker’s experience increases production efficiency and quality.

* Combine the different quality-standard levels from customers for a general production improvement.

* Involve worker`s suggestions and opinions.

* Regular meetings with department staff to discuss major defects and inform at early stage to find solutions.

**Recommend by ESGE for cutting and sewing**

Resources (material)
Resource productivity/material

Recommend by ESGE for cutting and sewing

* Need to find out the skill of each individual worker to optimize productivity.
* Recording of defects produced by each worker and if necessary take action by shifting to another operation or repeat training period.
* Direct communication to machinery manufacturer for proper installation and machine adjusting.
* Clear instruction to mechanic work rhythm, not only when defects are detected.
To minimize energy-consumption is very important and the need to do so will get even more important in future.

We assume that world market-textile prices will not go up, consequently every producer has to save costs, especially in a sector where the development of the prices are steadily increasing.

Of course we have to add that in yarn- and fabric-producing companies (spinning mill, factories for dying, bleaching and printing) the need for energy saving (gas, diesel, electricity, water, etc.) is much more important, nevertheless also companies doing only CMP can save a lot of costs.
sewing machines
The consumption of electricity per sewing machine is almost equal respectively there is not much to influence. Of course new sewing machines can be equipped with energy-efficient motors. The amount of investment for changing will be quite high and this isn´t priority no.1.
Lightning

In this point we see quite good possibilities to save money and resources. We recommend to install lights per machine, not per sewing line. Each light must have the possibility to be switched on/off separately, not per line. Light must only be switched on when the sewing person is sitting at the machine. With a better positioning of the light there is the chance to need lesser lamps and the brighter light will additionally support sewing person.
Resource productivity/energy

General/housekeeping
- Installations of systems to prevent leakages and spillages.
- Installation of preventive maintenance schedules.
- Routine equipment inspections.
- Proper working instructions
- Supervision and regular training of workforce in charge of housekeeping.
Potential for improving productivity

Following we estimate the potential for improving the productivity. We assume that the textile-company can only invest a small amount of money. A higher investment will of course affect a higher productivity-increase.
Potential for improving productivity

worker/labour productivity:

+30%  
 till  
 + 40%
Potential for improving productivity

Equipment productivity

+ 25%

+ 35%

Equipment machinery
Potential for improving productivity

Resource productivity
Material

+20%

Resources (material)
Potential for improving productivity

Resource productivity

Energy

+ 10% till
+ 15%

Resources (energy)