

Introduction



Nestlé is the world's leading nutrition, health and wellness company. It manufactures more than 70 brands in the UK, including well-known names such as KIT KAT®, NESCAFÉ®, FELIX® and SHREDDIES®. Nestlé also produce many household water brands such as BUXTON® and NESTLÉ PURE LIFE®.

In the UK, Nestlé employs more than 8,000 people across 23 sites (including 15 factories). Nestlé is one of the UK and Ireland's major exporters, exporting almost £400 million worth of products every year to over 50 countries around the world. Since Henri Nestlé

founded the company in 1867, Nestlé has taken pride in providing safe, high quality and responsibly produced products. Sustainable practices are at the heart of Nestlé's operation. Sustainability in business involves a long-term perspective. It looks at balancing economic, environmental and social impacts of the business. The aim of sustainable business is to limit negative impact in these areas to ensure future generations can prosper. This commitment to the environment and the communities in which it operates applies throughout the whole length of its supply chain. As Nestlé states:

'We believe that, to succeed as a business in the long-term and create value for our shareholders, we must also create value for society. We call this Creating Shared Value (CSV).'

Nestlé in Society

Across the globe, Nestlé has three key focus areas for Creating Shared Value as part of its 'Nestlé in Society' initiative. These are nutrition, water and rural development. This case study examines this commitment to society, with the sustainability and environment focus that was implemented at Nestlé Waters' new water bottling plant in Buxton.

The Nestlé Waters business has continued to grow in the UK, supported by the success of its strong local brands, Buxton Natural Mineral Water (the number one British branded bottled water) and Nestlé Pure Life spring water. The UK bottling factory at that time had no space to expand to meet demand. The site also had inefficiencies in the production process which meant time and resources were unable to be optimised. These factors lead to Nestlé Waters UK (NWUK) deciding to look for a new site and invest £35 million to build a brand new state-of-the-art combined plant and warehouse facility to bottle the two local waters. The new plant is one of Europe's most innovative and efficient bottling facilities.



Lean production

Lean production, an approach developed in Japan, aims to reduce waste. Waste is looked at in terms of time, money and quantity of resources used in production. Reducing these elements aims to increase productivity and efficiency. For example, reducing product defects will reduce costs through savings in the inputs used to make goods. It will also help reduce environmental impacts by using less materials and reduce the time wasted in dealing with poor quality products. Lean production focuses on minimising resources used in the production process. Production should therefore aim to take place using the most efficient use of space, machinery, labour, materials and, crucially, be in the shortest time period. At Nestlé this lean approach is called Nestlé Continuous Excellence (NCE).



Kaizen



Kaizen is another idea developed in Japan. It supports lean production by introducing the idea of continuous improvement. Kaizen is a concept that makes improvement the responsibility of everyone involved in production. Improving efficiency becomes a continuous process, not a one-off activity. Kaizen implies that even the smallest improvement should be made, as many small improvements can lead to big savings. Before building the new factory, Nestlé Waters used various techniques to see where the current factory could be made more efficient.

Nestlé Waters used a lean production technique called Value Stream Mapping (VSM). VSM illustrates the flow of materials and information required to bring the finished product to the consumer. Lean training sessions helped employees to determine where the production process could be improved to reduce waste, for example, by combining or removing elements of the process.

The outcome of the VSM at Nestlé Waters was then used to plan the new bottling plant, ensuring the processes were as efficient as possible. Nestlé's commitment to the environment and sustainability was a key factor throughout the planning process. The site for the new factory, called Waterswallows, was a previously undeveloped Greenfield site. Nestlé Waters worked closely with the local community through a consultation process to ensure plans fitted in with local community development plans. The site has great transport links, something that was very important to Nestlé to ensure its carbon emissions are kept as low as possible. Good transport links are vital, both in building the new plant and in the day-to-day running of the factory for goods in and out. The new site is large enough to enable Nestlé Waters to expand production to meet demand. It also allows Nestlé Waters to combine for the first time offices, warehousing and production on one site, something the old site did not allow due to size constraints. Bringing all warehousing onsite saves time and reduces the need for transporting stock, improving the site's environmental impact.

Eliminating waste

Value refers to the aspects of a product that customers think it is worth paying for. Added value refers to activities or processes that make the product better or worth more. Value can be added through changes to design or changes to the way a product functions or behaves. Value can also be added by reducing waste which in turn reduces production costs. Any activity which puts cost on a product without adding value is waste. Waste can happen at any part of the process. 'Muda' is the Japanese term for waste. Muda is broken down into the seven areas that make up the mnemonic 'TIMWOOD'.

The Kaizen Institute gave employees an overview of Muda. Nestlé Waters then carried out a 'waste hunting' exercise of the old factory looking at the seven areas of Muda. This exercise established that waste was present in three main areas: production, inbound materials and outbound products.

Key areas where waste was found included excess handling, waiting time and defects. For example, raw materials, packaging and finished goods were handled multiple times. Waiting issues included blockages, idle machinery and trucks being made to wait at loading bays. The exercise also

Factor	Impact	Improvement
T ransport	Moving materials unnecessarily wastes time and energy	Reduce weight/size of pieces to ease handling
I nventory	Too much stock increases costs of storage	Ensure suitable customer outlets available to buy products so no build-up of stock occurs
M otion	People moving or travelling excessively and unnecessarily	Use effective project planning to ensure efficient performance
W aiting times	Wastes employee time or keeps customers waiting	Equipment and timescales planned ahead
O ver-processing	Repeated activity wastes time	Elimination of unnecessary steps in process
O ver-production	Extra material has storage costs	Computer modelling reduces number of trials needed to obtain valid results
D efects	Reworking wastes time and materials	Computer modelling minimises trial failures

revealed other areas that could be further improved. These included label application on bottles, bottle cap application and finished bottle damage. The final area for improvement identified was that of water usage. Although the water bottling factory already has very low water usage in production, there was the opportunity for continuous improvements to further reduce this and add to improving the factory's environmental impact.

Muda

Now that these inefficiencies had been identified, Nestlé Waters used its lean training to plan the new factory design and production layout to reduce waste in all seven areas of Muda. Layout, transport and non-value added operations were all targeted. Planned improvements to reduce waste at the new state-of-the-art factory included:

- more efficient production line planning creating a more compact working area, reducing defects and waste water
- more efficient and automated warehouse operations onsite
- improved health and safety practices, separating the area for forklifts
- relocation of pallets storage and recycling leading to reduced travel time between operations.

Planning at the new factory also aimed to improve Nestlé Waters' environmental impact and the working environment for employees. For example, the new state-of-the-art factory has:

- a glass frontage to the building to provide natural light
- new lightweight bottles using 25% less PET plastic across the Buxton and Nestlé Pure Life ranges
- external accreditation as a zero waste to landfill site
- implemented a sustainable urban drainage system
- Considerate Constructors Gold Award
- excellent BREEAM rating - BREEAM is the independent rating for green buildings set down by the Building Research Establishment (BRE). It sets the standard for best practice in sustainable building design, construction and operation.

JIT

Just-in-time (JIT) is another Japanese lean production technique. It focuses on timings during the production process. Both storing and waiting for materials can increase costs. Waiting for materials will waste employees' time and could also delay production. JIT involves ensuring materials arrive just as they are needed. Similarly for outputs, transport must arrive to take finished products away just-in-time, without any waiting or storage costs.

JIT focuses on continuous improvement but only works as part of an overall lean strategy. It can improve the efficiency of processes. It can lead to a better return on investment through improving productivity. JIT also allows for fewer materials to be held at any one point which can reduce working capital needs as less finance is needed for stock, leading to better financial performance. This can lead to better returns to stakeholders such as investors, as any finance invested is yielding a direct return.



Stock control

Through JIT Nestlé Waters was able to make the most efficient use of storage and time at the new factory. Whilst the old site had to use limited storage and outsourced warehouse space off-site, the new factory eliminated these additional transport needs. At the old site stock had to be requested and then took time to arrive. Enough inputs had to be stored on-site to provide for production over the weekend, adding to storage costs and wasting space. Finished pallets of bottled water had to be held until trucks arrived to transport them. However, at the new site, transport and waiting times have been significantly reduced through raw materials being stored adjacent to the finished goods warehouse.



This greatly improved stock control. Shorter flows for raw material and the collection of waste from the production line also help make sure materials are in the right place at the right time, thus improving efficiency. JIT helps make big efficiency gains for Nestlé Waters. This requires excellent relationships with suppliers and distributors. Suppliers must deliver quality resources on time and distributors must ensure bottles are picked up immediately when they are ready. This aspect required a lot of planning but has delivered great benefits.

Benefits of lean production

Nestlé Waters uses lean production techniques to bring benefits other than gains to efficiency and quality. It also helps to create social and environmental benefits. Social benefits are those shared by the communities in which Nestlé operates. For example, the Waterswallows site in Buxton was designed to include a butterfly planting scheme. Working with Derbyshire Wildlife Trust and the local Butterfly Conservation Group, Nestlé Waters planted wild flowers within the factory grounds to attract butterflies back to the area. As part of Nestlé Waters' Creating Shared Value it has worked with the local community on projects including its on-the-go recycling programme and Project WET. Project WET is an educational school initiative which helps teachers and children learn about the vital role water plays in our lives.



A further benefit is employment, not just directly at the site, but as a result of building the new site. When building the new factory Nestlé Waters sourced the majority of its materials and labour from within a 50 mile radius of the site. This had a positive impact on the local economy whilst decreasing the amount of transport required for materials, reducing the site's carbon footprint. The new factory has also increased the number of apprenticeships and graduate roles that Nestlé can offer. Whilst the old site used agency and temporary workers, the new site employs over 100 full-time staff, drawn from the local workforce.

Environmental impacts

Nestlé Waters' focus on the environmental impacts of the new site goes well beyond those mentioned previously. There is a sustainable urban drainage system that manages the rainwater that runs off the site. An innovative heat recovery system has been designed to reduce waste and the impact on the environment. This system transfers heat from the bottling lines to the warehouse and offices, reducing the total energy output of the site further. Classic Derbyshire dry stone walls have reinstated field patterns and defined the boundaries of the site, ensuring it is in keeping with the surrounding areas using sustainable building practices.

Conclusion

Sustainability and Nestlé in Society are at the heart of everything that Nestlé does. Nestlé's £35 million investment in a new state-of-the-art bottling plant demonstrates this commitment. Every aspect of the new site was carefully planned to ensure maximum efficiency and sustainability. Waste can have an impact on many areas of operations. It can have negative financial, environmental and social implications. With help from experts in lean production, Nestlé Waters was able to critically audit the old site to establish where improvements could be made. From this audit strategic plans were created for the design of the new site. As well as creating efficiencies to financially benefit the company, Nestlé Waters focused on the societal benefit too, by building with careful design and technologies for the environmental benefits that the new factory could create. This included improvements to the local community and sustainability of the site. For example, using locally sourced materials improved the economy and brought employment to the area. Reducing the site's environmental impact also supported Nestlé's values. The resulting design means that the new factory is one of Europe's most innovative and efficient bottling facilities and has allowed significant reductions to the environmental impact of the business.