

9-2014

## The Art of the Kaizen Approach for Sugar Production in Ethiopia: Lessons from the Methara Sugar Factory

Asayehgn Desta

*Barowsky School of Business, Dominican University of California, asayehgn.desta@dominican.edu*

**Survey: Let us know how this paper benefits you.**

---

### Recommended Citation

Desta, Asayehgn, "The Art of the Kaizen Approach for Sugar Production in Ethiopia: Lessons from the Methara Sugar Factory" (2014). *Collected Faculty and Staff Scholarship*. 20.

<https://scholar.dominican.edu/all-faculty/20>

This Article is brought to you for free and open access by the Faculty and Staff Scholarship at Dominican Scholar. It has been accepted for inclusion in Collected Faculty and Staff Scholarship by an authorized administrator of Dominican Scholar. For more information, please contact [michael.pujals@dominican.edu](mailto:michael.pujals@dominican.edu).

## The Art of the Kaizen Approach for Sugar Production in Ethiopia: Lessons from the Methara Sugar Factory

Asayehgn Desta, Ph.D.

*Sarlo Distinguished Professor of Sustainable Economic Development, Barowsky School of Business,  
Dominican University of California, USA*

*Business Process Reengineering (BPR) deals with fundamental organizational change, or is the great-leap approach to redesigning and retooling. It seeks to bring a radical approach to creating a breakthrough in organizations trapped in outmoded and outdated business processes. Top managers and consultants design new ways of doing things and force companies to go beyond continuous improvement of existing products, services, and processes. Though innovative, BPR is being challenged by some companies looking for a strategic remedy that will contribute to the sustainable improvement of their performance and quality, add value for their customers while minimizing cost and eliminating waste. To counteract the expensive and technology-intensive strategy proposed by BPR, many managers and policymakers have embraced the Japanese management philosophy of Kaizen. For incremental change of productivity and addition of value, Kaizen uses a gradual approach using existing technology, training work teams, humanizing the workplace, and liberating the thinking of top management and employees at all levels. Since Kaizen requires the use of existing technology and the retraining of existing workers, many poor countries that lack capital embrace Kaizen management practices for improving their enterprises. A case in point is the Methara Sugar Company in Ethiopia where the production of sugar declined substantially. This was because of mismanagement of the company, disregarding juice leakage, repetitive loss of electrodes, and the outright stealing of sugar and spare parts. More importantly, the cane cutters negligently left uncut 4cm to 22cm of the canes still containing sucrose. In addition, when machines broke down, there were lengthy delays for repairs and servicing while waiting for outside technicians rather than using in-house technicians. With the anticipation that the Kaizen management technique would enable it to increase the quantity of sugar, meet the needs of consumers and be globally competitive, the Methara Sugar Factory adopted the Kaizen management technique in 2013. As a result of pursuing Kaizen standards, the Methara Sugar Factory has presently achieved the best yield in the world (that is about 126.93 tons per hectare.) Both the size of the plantation and sugar production have increased by 35% and 37% respectively. The production cost of producing one unit quintal of sugar has decreased by about 23 Ethiopian birr. The overall time efficiency has increased by about*

---

\*Corresponding author: Asayehgn Desta  
Sarlo Distinguished Professor of Sustainable Economic Development,  
Barowsky School of Business, Dominican University of California, USA.  
E-Mail: [destaa@prodigy.net](mailto:destaa@prodigy.net)

20%. In addition, since a sugar cane crop is very sensitive to climate, soil type, irrigation, fertilizers, and insects, instead of growing sugar cane year in and out on the same land, the company is growing peas in between the sugar cane plantations to replenish soil nutrients and to minimize the vulnerability of sugar cane to insects.

**Keywords:** Business Process Reengineering, Kaizen, process management, continuous improvement, fundamental and radical change

## INTRODUCTION

After the defeat of Italy by Ethiopia at the Battle of Adwa on March 1, 1896, Japan took advantage of Ethiopia's patriotism as a strategy to fight against Russian aggression towards Japan in 1904. Currently, with the globalization of the world economy and increased competition and realizing that Japanese development and dominance in industrialization was based on its application of Kaizen management techniques rather than an application of the Business Process Re-engineering (BPR), a number of Ethiopian enterprises have been vigorously exploring the Japanese Kaizen management system to redesign their manufacturing enterprises and eventually improve their competitiveness in the global market.

Business Process Re-engineering (BPR) also known by names, such as "core process redesign" or "new industrial engineering" or "working smarter" was introduced as a perceived solution for financial reengineering after the economic crisis of the 1980s and the technological reengineering phase of the 1990s. As a reengineering effort, BPR involves a fundamental reconsideration or a radical redesigning of the organizational processes of companies to achieve dramatic improvement by minimizing current costs, improving customer services and achieving world-class competition. According to Hammer and Champy (1993:46), business reengineering is a new beginning, or is a *fundamental* rethinking and *radical* redesign of business process improvement with a continuous improvement strategy for business firms to achieve dramatic improvements in quality, services and speed. As indicated above, Hammer and

Champy's definition includes four very significant key words. These are:

- **Fundamental:** "Why do we do what we do? And, "Why do we do it the way we do?" Reengineering ignores what is and concentrates on what should be.
- **Radical:** Disregarding all existing structures and procedures and inventing completely new ways of accomplishing work.
- **Dramatic:** Used for quantum leaps in performance instead of small changes.
- **Process:** Collection of activities taking multiple inputs to create an output that is of value to the customer (to Kiefer, T. 2003/2004).

In simple terms, BPR assumes that the current process is irrelevant and companies need to start over. Such a clean slate perspective is assumed to enable the designers of business processes to disassociate themselves from today's process and focus on a new process more relevant to the future (Kiefer T., Winter 2003/2004). By rejecting the existing business process, BPR aims is to devise new ways of organizing business tasks, employees, and redesigning information technological systems so that the business processes eliminate waste and redundancy, thereby improving efficiency and implementing process changes to acquire competitiveness. To succeed at reengineering, BPR argues that the managers have to be visionaries, motivators, and "leg breakers." They also need to proceed with slow and confident steps. In simple

terms, a company needs to undertake this re-engineering strategy because it a) needs a dramatic improvement to survive, or b) may be doing quite well but management might anticipate and expect some serious and threatening problems and competition in the near future, or c) may be doing well and wants to do better to make it more difficult for other companies to enter the competition (Goksoy, A. Ozsoy, B and Vayvay, O. 2012; and see also so Hammer and Champy, 1993).

Based on BPR, to achieve its objectives and most importantly to satisfy customers' requirements, a company needs to focus on processes rather than functions that will lead to a restructure and radically new redesign (i.e., firms need to get to the root causes of problems rather than making superficial changes, or getting trapped by the way things are currently done, or fiddling with what is already in place.) In addition, reengineering isn't about making marginal or incremental improvements. It derives optimum advantage from all available resources. In addition, instead of focusing on particular tasks, jobs, or an employee, reengineering firms need to pay attention to an evaluation of activities by taking one or more kinds of surveys that will create an end result of value to customers. Generally speaking, Kiefer (2003/2004) argues that according BPR rules, companies need to undertake reengineering processes if a) they are in deep trouble (costs are higher than competitors or if the product failure is higher than the competition), b) the financial situation is still good but problems might appear in the future because of changing customer requirements or an altered economic environment), and c) companies want to improve their own advantage in order to keep their lead over their competitors (Kiefer, 2003/2004). Based on reengineering, the process flow of the business process includes rethinking, redesigning and retooling techniques. More specifically, in processing their strategy following BPR companies have to follow these steps: 1) develop business vision and process objectives, 2) understand and measure the current processes, 3) identify the IT levels, 4) design and build a prototype, 5) streamline, 6) measure and control, and 7) engage in radical improvement (Kiefer, 2003/2004).

Given these procedures, BPR has become a widely known management approach. Starting in the early 1990s?, BPR has been used to improve quality, increase productivity, maximize an organization's potential and add enhanced value to customers by formulating a roadmap for redesigning business processes, reducing cost, and process time (see Cao et al 2001). Researchers and practitioners, however, have found that though BPR is concerned with re-architecting business and management processes, instead of enhancing the performance of existing processes, BPR discards and replaces the old methods of production with entirely new ones to obtain dramatic and sustainable improvement in quality, cost, lead times, outcomes, flexibility and innovation (Bogdanoiu, 1913).

The abolishment of the old method of production and the designing of completely and radically new processes, mainly driven from top level managers, not only disrupts the status quo but is likely to lower employee morale and create fear of layoffs or a change in the power structure (Ahadi, 2004). In addition, with BPR, employees are less involved in the process and are minimally empowered to be decision makers (Goksoy et al, 2012). Thus, not every company will succeed by applying BPR. Actually, as asserted by Fiefer, "between 50 % and 70 % of the organizations which have undertaken a reengineering effort do not achieve the dramatic results they have intended" (2003/2004).

Thus before implementing the grand BPR technique to identify problems and bottlenecks related to the process, more particularly in developing countries where human resources, capital, and technology are scarce, a company needs to perform pilot versions of the new processes. Doing pilot versions can help detect application problems ahead of time to solve before full utilization. In short, the aim of the pilot implementation is to over-review the design of the new processes and to identify and overcome the potential flaws that might occur in the real implementation stage (Goksoy et al, 2012). Furthermore, as argued by Peppard and Rowland (1995), a pilot trial may take time and cost much but in case of failure of the grand BPR process, the time and cost in order to amend it would be much greater.

Business Process Reengineering does not entertain existing operational styles to enhance existing processes, but rather seeks to instill new processes using a radical approach to bring about breakthroughs for organizations trapped in outmoded and outdated business processes. Though innovative, BPR is being challenged by companies that are looking for a strategy that will contribute to the sustainable improvement of their performance and quality, add value to their customers by minimizing cost, and eliminate waste. To effectively address this situation, many managers and practitioners have embraced the management philosophy of Kaizen that may kindle their interest in seeing that their employees are empowered, contributing to the workers' satisfaction.

After World War II, when company managements and the government of Japan acknowledged that there was a problem with their confrontational management style, coupled with a pending labor shortage to help with the rebuilding of Japanese industry, American business and quality management experts introduced Kaizen. In collaboration with the workforce, most Japanese companies introduced also lifetime employment and established guidelines for involving every employee - from upper management to the cleaning crew and the distribution of benefits to workers. As argued by Brunet (2000), the lifetime employment contract given to workers provided the necessary security system and ensured confidence in the work force.

In addition, Kaizen forms an umbrella that covers many techniques including *kanban*, total productive maintenance, customer orientation, six sigma, automation, just-in-time, small group activities, a suggestions system for work improvement, discipline, and productivity improvement that involves everyone, managers and workers alike. The Kaizen process was introduced and applied by Imai in 1986 for the Japanese Toyota automaker to improve its efficiency, productivity and competitiveness in the globalized market. For instance, companies that employ Kaizen accept about 60 to 70 suggestions per employee per year (Imai, 1986 and Singh and Singh (2009).

Unlike BPR, Kaizen recognizes small improvements that have been made to the status quo as a result of ongoing efforts. According to Newitt (1996), Kaizen liberates the thinking of both management and employees at all levels and provides a climate in which creativity, setting standardization, and value addition can flourish. In addition, in the Kaizen approach, the employees of a firm are taught essential elements of lean thinking in order to maintain their ability to meet higher standards on an on-going basis. Thus, Kaizen is focused on making small improvements on a continuing basis by using teams as a means for achieving incremental changes. As argued by Bogdanioiu (2013), every employee of Kaizen: a) reduces waste in areas of inventory, waiting times, transportation workers motion, employee skills, over production, excess quality, and in the process b) improves space utilization, product quality and employee retention; and c) indulges an on-going process of continually making small improvements that improve outcomes. The main differences between BPR and Kaizen are given below.

As shown in Table 1, the core philosophy of BPR is to bring drastic and fundamental improvement of companies as a result of large investment of resources and technology. Thus, BPR pushes top managers and consultants into designing new ways of doing things and forcing them to go beyond continuous improvement of existing products, services, and processes. On the other hand, the Kaizen technique is tailored to bringing incremental change to productivity and addition of value. Due to lack of capital, a number of developing countries are using the Kaizen management technique because it uses existing technology. But, by training for teamwork, humanizing the workplace, and liberating the thinking of top management, employees should increase creativity and productivity.

Due to mismanagement from juice leakage, repetitive loss of electrodes, uncut canes and outright stealing of sugar and spare parts, the sugar output at the Methara Sugar Factory declined from 1,200, 349, 1,019,623, 931,395, and 797, 983 quintiles in 2009/10, 2010/11, 2011/12, and 2012/13 respectively. (Report given to the

Ethiopian Peoples' House and Federation House, June 2013). Also the repairing and servicing of machines when broken were handled by outside technicians rather than being repaired by all workers who work in line.

### **TABLE 1 HERE**

Therefore to improve its management techniques, the Methara Sugar Factory in Ethiopia embarked on the Kaizen management technique in 2013 to increase the productivity of sugar, meet the needs of consumers, and make Ethiopia globally competitive. Thus the purpose of the study is to provide a systematic process of utilizing the Kaizen strategy, and to assess the steps used by the Methara Sugar Company case to implement the 5S, lean thinking, and just-in-time strategies to improve quality and productivity outcomes.

### **METHODOLOGY**

The focus of the case study was to check the effectiveness of Kaizen philosophy at the Methara Sugar Company that is currently implementing the Kaizen technique to achieve higher productivity. Though by and large anecdotal observations are used, the study focuses on performance indicators such as the application of the 5S the implementation of lean thinking, reduction of space in the building, material handling, and the lowering of scrap rates. In addition, some key performance factors that have been reported by the company have been used to assess the effectiveness (or to assess the extent to which customers requirements are met) and efficiency (refers to minimizing cost of resources used to produce the products) of the implementation of the Kaizen strategies. Finally, some recommendations are suggested to the company that might overcome some of its problems and improve its performance.

### **COMPANY BACKGROUND**

Geographically, the Metahara Sugar Factory is located in Ethiopia, 200 km southeast of the capital Addis Ababa, on the Addis-Dire Dawa-Djibouti road within the upper Awash Valley. According to the company's Handbook (2014), the Methara Sugar company was established as an extension of the Wonji/Shoa Sugar Factory because the land

and climate of Methara plains was suitable for sugar cane cultivation and there was an increase of demand for sugar both in Ethiopia and in the global market. Therefore, the Ethiopian government and the International Board of Hanger Vondr Amsterdam (H.V.A) Ethiopia Sh. Co. signed an agreement in July 3, 1965 to initially establish 11000 hectares of land in Methara for sugar plantation, office and employees' residence. At present the factory has 14,733 hectares of land covered by cane and fruit plantation respectively. In addition, the company employs 186 professionals, 830 semi-professional and 8,685 line workers (Methara Sugar Factory, Report given to the Ethiopian Peoples' House and Federation House, June 2013).

It is worth noting that the sugar project at Methara started as a joint venture between HVA and the Ethiopian government. The Ethiopian Government owned only 10 percent while 90 percent was owned by the HVA. The local pastoral groups were either evicted from their lands, or were resettled without adequate compensation (Bonestam (1974). Since the pastoral population did not participate in project planning and the project didn't take into consideration the culture of the local people, the expansion process was linked to a severe environmental degradation. The construction of dams and dykes for the development of irrigated farms changed the seasonal run-off patterns of the Awash River. As a result, the sensitive wetland ecosystem within the flood plains was severely disturbed and contributed to the loss of habitats and rain forest. Furthermore, over the years, the health risks for pastoralists have increased significantly due to herbicides and pesticides (see Gamaledin, M (1987), Gebremariam A (1994), and Bonestam (1974).

With the change of government in 1974, under Proclamation No. 31 of 1975, the Military (Derg) Regime nationalized the sugar plantations and their production. In 1991, with the dismantling of the military government, the sugar corporation was established as a public enterprise to be run by the Ethiopian Sugar Development Agency. In 2010, under the Council of Ministers, Regulation (No. 192/2010), all existing sugar companies were reorganized to be run by the Ethiopian Sugar

Corporation. The vision of the Metahara Sugar Factory was to be one of the leading Sugar companies in the world with least cost of production of sugar. The mission statements of the Methara Sugar Factory are to:

1. Produce sugar of standard quality at the least cost possible and satisfy customers
2. Utilize all resources at its disposal and to provide the best service to the society at large and remain competitive and profitable
3. Be environmentally friendly in the process of producing sugar and
4. Provide an affordable living standard to the employees of the company.

To become self-sufficient in the production of sugar and be competitive enough to maintain a suitable growth pattern at the international level, not only has the Methara Sugar Factory diversified its products of sugar cane into ethanol, electrical power, fertilizers, as well as building tissue culture laboratories, it has also embarked on the Kaizen Japanese management system.

## DATA ANALYSIS

As mentioned above, the Kaizen techniques were adopted by the Methara Sugar Factory because it was conducive to the re-creation of self-disciplined and self-innovating organizations. So, the concern that we have, is the Methara Sugar Factory efficient and effective enough to utilize the following Kaizen strategic management initiatives, tools, and methods: a) the 5S housekeeping activities, b) lean management or waste management tools, c) just-in-time, and d) Total Productive Maintenance (TPM)?

**The 5S Housekeeping Activities:** In addition to training and creating worker's awareness, the beginning of the Kaizen housekeeping journey of management starts by determining that a problem exists and that the workers have a responsibility to

solve the company's identified problem. The 5S approach provides standardization for the maintenance of good housekeeping and fosters an increase in quality and productivity. According to Juhari et al (2011) the 5S techniques incorporate: a) sorting (*SEIRI*) or gathering the spare part materials available in the company's store houses, organize things well, and label the items as "Necessary", "Critical", "Most important", "Not needed now", throw what all is "Useless". Items which are critical and most important are kept at a safe place; b) setting all (*SEITON*) or organizing the functional spare parts in a pleasing atmosphere so that workers don't have to waste their precious time searching for items or important documents; c) shining (*SEISO*, spreading the clean products in a clean workstation and all items are stored in cabinets and drawers. In addition, the necessary documents are kept in proper folders and files; d) standardizing (*SEIKETSU-SEIKETSU*) or consistently setting certain standard rules and policies to ensure superior quality; and e) sustaining improvement or self-discipline (*SHITSUKE*) using the Six Sigma targets to reduce variations and increase quality and safety, and employees need to respect organization's policies and adhere to rules and regulations (see Desta et al, 2014).

The implementation of the 5S housekeeping techniques and the standardization process is an ongoing process that spreads the benefits of improvement. In order to motivate its employees and achieve the 5S, all the workers at the Methara Sugar Factory had to master the goals of the firm. Our anecdotal observation indicates that the Methara Sugar Factory employees have successfully achieved the 4S (sort, set in order, shine, and standardize the clean products to optimize operations). To make decisions and minimize variations in the products, the workers were trained to work in teams given that the top managers have a genuine desire to achieve quality through empowering all the employees. The company leverages the employees' suggestions for improvement in production. Management's support of an employees' reward system or incentives for the most productive workers are still to be incorporated. It might be better to give money reward rather than honor, for best worker

of the month. Also, the suggestions forwarded by the workers need to be posted on the wall of the workplace in order to encourage competition among workers and groups. Tools that have been improved as a result of workers' suggestions need to be displayed so that visitors and workers from other work areas can learn from them. In addition, though difficult to apply, the application of the Six Sigma methods for estimating the variation from the average of any process to control the quality of the sugar produced does not seem to be transparent enough.

### **Lean Management and Waste Elimination**

**Strategies:** Elimination of waste includes removing non-value adding activities that include removing unnecessary wastes caused by accumulating unnecessary equipment, materials or people. In the art of sugar production, wastes accumulate as a result of 1) overproduction, 2) waiting time, 3) transportation, 4) lack of inventory control, 5) over processing, 6) inefficient motion, and 5) production of defective materials. At the Methara Sugar plantation and production process, the company seems to be very efficient. It neither over produces nor over processes the production of sugar. The storage house is clean because unnecessary inventory is not stored. The company has designed and modified local rubber-tired carts that haul cane to the mills. Though the transportation system is relatively effective, the motion of workers seems to be excessive because the structure of the building is not designed for the Kaizen process. For example, since current operating systems are outdated there appears to be leakage of oil and other excessive nutrients. If not controlled, such wastage may seep into ground water and contribute to greenhouse-gas emission.

**Productivity Improvement Techniques (PIT):** As described in the Factory's Handbook, the enterprise has an automated Management Information System (M.I.S.) that enables generation of reliable and simplified information for decision making. The company is International Organization for Standardization (ISO) registered and implements the ISO 14001:2004 environmental management system. The enterprise has also built a Quality Management System (ISO 9001:2000)

into its processes that will ensure the capability of the enterprise to deliver quality products, services to its customers and manage environmental matters as an integral part of its business activities.

**Just-in-time (JIT):** The sugar production trend has been moving to a just-in-time process to minimize inventory, lead-time, setup time, workload, and maintenance time. More particularly, these steps are done effectively in the store and in the health care units. For example, it takes less than three minutes for the storage master to identify a spare part from the store. Also, in the factory's health care system, it takes less than two minutes for the technician to identify the file of a patient even though the factory is not yet equipped with adequate computers.

**Productivity Measures:** As discussed above, the main reason the company implemented the Kaizen technique was to increase the overall productivity of sugar production. At the Methara Sugar Factory labor has become very efficient and posters are posted everywhere to motivate the workers. The company has effectively implemented Kaizen techniques using the participation of small groups of workers held every week to trouble shoot problems faced and to brainstorm to find solutions. As a result, the output of sugarcane plantation and sugar production have increased by 35% and 37% respectively.

The quality of the sugar produced by the company has been reasonably acceptable to vendors. Though the vendors feel the sugar they have been buying from the factory has been good quality with minimum reject rates, the opinion of regular consumers has yet to be assessed by the marketing department to ascertain customers' opinions on the quality of the product, pricing, promotion and packaging. In addition, because of health reasons, consumers have been cutting back on the consumption of sugar products, so the company needs to increase the use of sugarcane for the production of ethanol and other products.

### **CONCLUSION**

Beginning with the introduction of the Kaizen management techniques at the Methara Sugar

Factory, Ethiopia, the overall performance of the company may be considered remarkable and from the outset the sugar plantation area has a panoramic view. In pursuing Kaizen standards, the Methara Sugar Factory has achieved a nationwide average sugarcane crop yield of 126.93 tons per hectare. Currently, both the sugarcane plantation and sugar production have increased by 35% and 37% respectively. The production cost of one unit quintal of sugar has decreased by about 23 Ethiopian birr and the overall time efficiency has increased by about 20% since the company has embarked on Kaizen (Methara Sugar Company, June, 2013).

Also, the Kaizen management strategy, by involving everyone in its organization to work together, has achieved improvement without large capital investments. Kaizen is ingrained in the minds of both managers and workers because slogans about the Kaizen philosophy are posted all over the factory as reminders to improve the efficiency of the existing infrastructure. Not only for the factory workers, the posters give valuable lessons to visitors letting them know there is no end to improvement and that many small incremental developments will accumulate into substantial gain. The workers appear highly motivated and feel that the company has improved their morale and safety. For example, by and large, the health services center is very clean and gives both preventative and curative services to the workers of the company and their families. The most remarkable aspect of the Kaizen socialization process is that it has positively affected the workers to practice at home what they have been socialized to do at the sugar factory.

Over time, upon the company's total mastery of Kaizen, the performance measures are likely to show a road to success. However, the sustainability of the company should not be seen only in the production of highly productive cane sugar (sucrose). But, it should extend to the production and processing of other products that include, molasses, bagasse (the residual dry fiber of the cane after cane juice has been extracted, that can be used as a fuel source for the boilers, production of paper, cardboard and panel boards. Bagasse could be used as a replacement for wood

in many of its applications); dried filter cake (used as an animal feed supplement, fertilizers, and source of sugar wax); and the production of ethanol used as a biofuel alternative to gasoline. By diversifying the energy security, Ethiopia could conserve its scarce foreign exchange reserves on fuel imports, thereby lowering its exposure to price volatility in international oil markets (Alemu, D., Feb 26, 2013). Finally, while the company is wrestling with the Kaizen management strategy, it needs to figure out how the excessive electricity generated from steam could increase its revenues by selling to local power companies.

Realizing that a sugarcane crop is very sensitive to climate, soil type, irrigation, fertilizers, and insects, instead of growing sugarcane year in and out on the same land, it is admirable that the company is growing peas to prevent damaging the ecology of the soil (including depletion of soil nutrients that prevent the vulnerability of sugarcane to insects). However, in our world today, no product sold in the market can be developed without taking into consideration its impact on the environment. Therefore, the company would be able to achieve sustainable productivity if it further addresses the impacts of environmental and social concerns such as soil degradation, biodiversity, the overuse of water, air and soil pollution and the processing effects of cane and beets. For example, when sugar mills are cleaned, a tremendous amount of organic matter is released into the environment and streams. It reduces oxygen levels in the water, and kills freshwater biodiversity. Sugar plantations need to be irrigated using water dripping system where only a small percentage of applied water is used by the crop ((see for example, WWF, 2005).

## REFERENCES

- Ahadi, H.R. (2004). "An examination of the role of organizational enablers in business process reengineering and the impact of information technology." *Information Resources Management Journal* , (17), 4, 1-19.
- Alemu, D. (Feb. 26, 2013). *Scoping Report on the Status of biofuel Developments in Ethiopia*" *Country Scoping Report Study for an ODI*

- Project on Recent Biofuel Developments in Five Developing Countries*. London: Overseas Development Institute.
- Bondestam, L. (1974). "People and Capitalism in the North-Eastern Lowlands of Ethiopia". *Journal of Modern African Studies*, 12(3): 423-39.
- Cao, G. Clarke, S and Lehane, B. (2001). A critique of BPR from holistic perspective, *Business Process Management Journal*, vol.7, no 4, 332-339.
- Desta, A. et al (April 2014) "analysis of kaizen Implementation in Northern Ethiopia's Manufacturing Industries." *International Journal of Business and Commerce*. Vol. 3, No. 8, pp. 39-57.
- Gamaledin, M. (1987) " State Policy and Famine in the Awash Valley of Ethiopia: The Lessons for Conservation" *Conservation in Africa*. Cambridge: Cambridge University Press, Pp.327-344.
- Gebre-Mariam, A. (1994). "The Alienation of Land Rights among the Afar In Ethiopia". *Nomadic Peoples*. 34 (35), pp. 137-146.
- Goksoy, A. Ozsoy, B. and , Vayvay, O. (January 16, 2012). "Business Process Reengineering: Strategic Tool for Managing Organizational Change an Application in a Multinational Company." Canadian Center of Science and Education.
- Hammer, M., and Champy, J. (1993). *Re-engineering the Corporation: A Manifesto for Business Revolution*. New York: HarperCollins.
- Imai, M. (1986). *Kaizen: the Key to Japan's Competitive Success*. McGraw Hill, New York, USA.
- Juhari, N. Abidin, N. and Omar, M. (2011). Factors Influencing Employees' Motivation in Implementing 5S System, *Human Resources Management*. Vol.39, pp. 4838-484.
- Kiefer, T. (2003/2004). "Organization & Markets: Advantages and Disadvantages of Business Process Reengineering."
- Methara Sugar Company (June 2014). *Handbook*.
- Methara Sugar Company, ( June, 2013). Report given to the Ethiopian Peoples' House and Federation House.
- Newitt, DJH (1996). "Beyond BPR and TQM- Managing the Processes: Is Kaizen Enough". *Proceedings of Industrial Engineering*, Pp. 1-5, Institution of Electric Engineering, London, UK.
- Peppard, J. and Rowland, P (1995). *The Essence of Business Process Re-engineering*. Prentice Hall, London, England, 237-244.
- Singh, J. and Singh, H. (2009). *Kaizen Philosophy: A Review of Literature*. Ludhiana, India: The Icfai University Press.
- World Wildlife Fund (July 2005). *WWF Action for Sustainable Sugar: Making it Sweeter for Nature*.

## APPENDIX

**Table 1: Comparison of Business Process Reengineering and the Kaizen Management Technique**

Variable	Business Process Re-engineering (BPR)	Kaizen Management Technique
<b>Core Philosophy</b>	Calls for drastic changes using large investment of resources and development of information technology to accelerate strategic decisions of business environment to react very quickly to global hyper competition.	Ensures commitment and desire to continually improve the quality, productivity, value addition of a company using current technology, reducing waste, humanizing the workplace, and liberating the thinking of top management and employees at all levels.
<b>Organizational set up</b>	The entire technological, human, and organizational dimensions are changed through command and control by top management and consultants. Employees are expected to follow some specific rules.	Bottom up team work, encourages and involves every employee to be responsible for improvement of the organization, from upper management to the bottom crew.
<b>Duration</b>	Focused on a "project" with a defined beginning and end.	Ongoing marginal changes with continuous improvement
<b>Implementation strategy</b>	BPR radically reengineers faulty processes. It is process-oriented using <b>inputs</b> (such as discovering customers' needs), and <b>processing</b> (such as analyzing processes in the enterprise and taking into account existing limitations.) Designs alternatives to optimize workflow and productivity and delivery of the expected results ( <b>outputs</b> ).	Kaizen generates process-oriented thinking. It is people-oriented, is directed at people's efforts to Plan - Act - Check -Do (PACD). By establishing clear and achievable targets, Kaizen uses techniques such as: 1) Total Quality Management (TQM); 2) 5S techniques; 3) six sigma; 4) lean thinking; 5) just-in-time; 6) total product maintenance-improvement; and 7) suggestion system – focuses on discipline and workers and is very methodic.
<b>Acceptance</b>	High risk of things reverting back to the way they were soon after the consultants leave	Since the people that actually do the work are the ones making changes - acceptance is very high
<b>Cost</b>	Often involves expensive technologies, computers and other systems	Reduces cost through lean approach or minimizing waste
<b>Technology</b>	High and expensive technology led by computer consultants	Mostly "lean" methods and a preference toward visual methods

*Source: Bogdanoiu, C. (2013). "Business Process Reengineering Method Versus Kaizen Method." Spiru Haret University, Romania, and Kiefer, T. (2003/2004). "Organization and Markets: Advantages and Disadvantages of Business Process Reengineering."*