



Waste minimization circles under the NPC

The approach to environmental management has changed from treatment/cleanup to prevention/conservation. Waste minimization (WM) can play a significant role in this approach, especially among SMEs. The National Productivity Council (NPC), India, saw the need for a new mechanism that could overcome various barriers faced by SMEs in WM efforts and developed the WM circle (WMC) concept in cooperation with the Ministry of Environment and Forests (MoEF). A WMC is a small group of SME entrepreneurs manufacturing similar products and employing the same processes who meet regularly on each others' premises to analyze operations, identify sources of waste generation, and undertake WM options to increase individual profitability and reduce pollution loads (Figure).

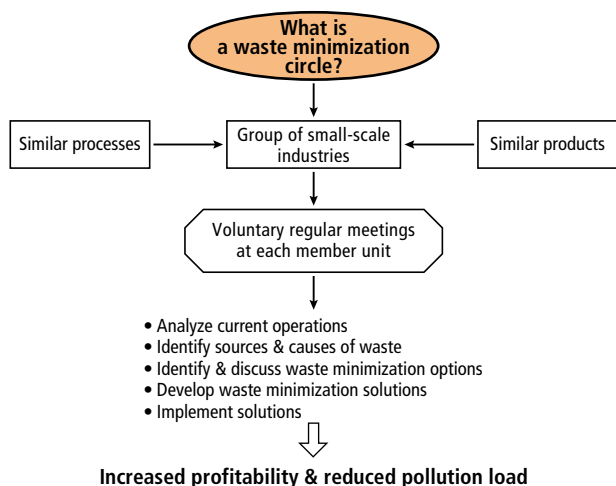


Figure. Outline of the WMC concept.

The NPC's WMC project is part of manufacturing extension services for SMEs. It started in 1994 and has undergone three phases after monitoring and review of the initial results. To date, 158 WMCs have been established in 17 states, representing more than 40 industrial sectors. The consolidated results of each phase are summarized below.

Phase I

In phase I (1994–1997), 15 WMCs were established, covering five industrial sectors (pulp and paper, textiles, electroplating, etc.) in three states. They involved more than 75 SME units and identified over 170 WM options, of which more than 120 were implemented. Some 25 workshops/training courses were organized in this phase. The participating units achieved savings of US\$0.28 million, including 10–30% reductions in energy use and 5–20% in water use.

Phase II

Phase II covered the period from July 1997 to 2005, during which a project review was undertaken by an independent consultant in 2000. The results led to a revision in the terms of reference of the WMC project by the MoEF in consultation with the World Bank to optimize monitoring and streamline WMC operations. By the end of phase II in 2005, 118 WMCs had been established (against a target of 100). In addition, a new plan for networking was devised where research institutions, state pollution control boards, private consulting firms, and industries interact through

the WMC framework under MoEF/World Bank sponsorship and facilitated by the NPC to lay a firm foundation for the WM movement.

In concrete terms, 10 training programs for 168 individuals representing 112 enterprises were organized in phase II. The number of WMCs reached 118, with 45 facilitator organizations establishing circles, including six in NPC regional offices. The number of industrial sectors covered expanded to 41, with the addition of the foundry, tannery, textile-processing, ceramic, and hosiery subsectors. The numerous WMCs in operation identified more than 600 WM options, of which over 250 were undertaken in SME industrial units. While circle members made investments of US\$5.56 million in WM efforts, they reaped annual savings of US\$3.7 million, bringing total savings to US\$9.26 million by the end of 2005. The environmental benefits included reductions in water, energy, and material consumption of an average 10–30%; reduction in solid waste generation of 5–20%; and yield improvement of 2–5%.

In terms of multiplier effects, the activities of WMCs reached over 6,000 individuals in various forms. For example, the project awareness materials developed included a training package along with a WM manual and the launch of a dedicated website (www.wmn.nic.in). By the end of phase II, 21 issues of the *WMC Newsletter* had been published, with 1,800 copies of each distributed widely. Five posters, an audiovisual CD, and a technical brochure aimed at the textile industry were also created.

Phase III

Because of the numerous successes during phase II of the WMC project, coupled with rising demand for more WMCs from both WMC facilitators and SMEs, phase III of the project started from July 2007 with the initial target of establishing 20 more WMCs across the country, especially in priority industrial sectors. This target number was based on budgetary constraints and the necessity of addressing other environment-related project activities like the National River Conservation Plan.

As of October 2012, 25 additional WMCs had been set up under phase III, of which 10 were under facilitator organizations. They covered 14 industrial sectors with the addition of the earthen tile, steel rolling, paint and resin, engineering, and pharmaceutical (ayurvedic) subsectors. Five training courses had been organized, which trained more than 60 representatives of over 25 SMEs and other enterprises. Public outreach continued to clusters and individual organizations. The training package was revised in phase III, and 11 new issues of the *WMC Newsletter* had been published as of October 2012.

Conclusion

The unique concept of WMCs and associated methodology have had a positive impact on the Indian industrial sector and changed mindsets in enterprises. The WMC project catalyzed group efforts for better environmental management and benefited SMEs in concrete terms. The NPC believes that this model can shape future policies and technological interventions for the sustainability of the SME sector, national economy, and environment. *Contributed by M.J. Pervez, Group Head (Environment) & Director (NCPC), NPC, India.*