



## Improving the Quality, Quantity, and Variety of Mosquito Net Production

Under the USAID NetMark Project (2000-2009), AED worked with all major net manufacturers in Africa to improve their production capabilities. This effort started with the goal of improving the quality of African net production so that it met international standards that allowed African companies to be reliable suppliers of quality nets to NetMark's multinational and national partners. It evolved over time to help manufacturers remain relevant by adding a capacity to produce LLINs (long lasting insecticide treated nets). While it will be difficult for African manufacturers to compete broadly with large Asian manufacturers and with the research and development capacity of multinationals, local production does provide some unique benefits for the countries:



- Producing products that match local needs and preferences. In Uganda, for example, a local garmenting operation recognized that many boarding schools needed nets for their triple bunk beds. They designed a net and hanging system to cover these beds, and malaria cases plummeted in these schools.
- Supplying ITNs to the open markets where most lower income people shop. Open market traders prefer to buy a few thousand ITNs on a regular basis and are highly unlikely to import a container of ITNs from Asia.
- Maintaining jobs and investment inside the country.

The major activities carried out by AED were in the areas of:

**1. Improving Manufacturing Quality and Efficiency:** AED sent textile engineers to every major net manufacturer in Africa to conduct confidential quality control assessments. Immediate changes were often made on the factory floor, and comprehensive recommendations on improving quality control standards to international levels were provided. Based on this experience, AED organized a workshop on Quality Control for ten East and West Africa manufacturers and prepared a *Handbook on Practical Quality Control for Mosquito Net Manufacturers* that is available at [.netmarkafrica.org](http://netmarkafrica.org)

**2. Helping Local Net Stitchers Produce and Market Quality ITNs:** AED worked with garmenting operations throughout Africa in various ways. In East and South Africa it provided them with technical assistance on improving the quality and efficiency of production and linking them to commercial firms that needed net suppliers. In Nigeria, it worked with net stitcher associations to link them with suppliers of netting and insecticides that meet international

standards and provided sealing machines that allowed them to bag their nets with an insecticide kit. ITN production by the stitcher associations increased from 0 in 2004 to 2.1 million in 2008. In Uganda, AED linked Mosquito Net Village (MNV) and Coopers Ltd. with Clarke Mosquito Control to start the first LLIN production in Uganda. Clarke supplies its Duranet<sup>®</sup> polyethylene netting fabric in rolls; MNV cuts and sews it into LLINs that meet local size preferences; and Coopers Ltd. markets and distributes the product in Uganda under the Duranet<sup>®</sup> brand name. AED helped conduct a feasibility study, write a business plan, create the partnerships, run an industrial trial to assess MNV's ability to handle polyethylene netting, and trained MNV staff in all steps of production.



**3. Expanding links to Insecticide Manufacturers and Distributors:** AED linked African net producers to sources of netting and insecticide treatment kits that met international standards; and then linked them to distributors in various countries who needed reliable suppliers.

**4. Technology and Product Development:** As the international standard began to shift from ITNs to LLINs, African net manufacturers encountered little interest from multinational LLIN companies on sharing their LLIN technologies and starting production in Africa. Only Sumitomo and A-Z Textiles of Tanzania formed a joint venture with the assistance of WHO, ExxonMobil, Acumen Foundation, and other donors. The other LLIN technology holders preferred to maintain their production in Asia. AED formed a partnership with Bayer Environmental Science and Siamdutch Mosquito Netting Company of Thailand to develop and commercialize an automated manufacturing process that treated finished sewn nets with LLIN chemistry. This partnership yielded an environmentally safe, zero-effluent process that can be easily adapted to different production capacity requirements. The specifications for this end-of-line LLIN process are in the public domain and can be used by any manufacturer. The technical details of this process are posted on [.netmarkafrica.org](http://netmarkafrica.org) for use by any company. Siamdutch built a \$5 million factory in Thailand called Tana Netting with a capacity of 3 million LLINs/year, and Sunflag/Nigeria installed this system in 2009.



In 2005, AED organized an LLIN Technical Meeting in Nairobi that brought together 29 companies involved in net and insecticide production and public sector groups that were the major purchasers of LLINs. AED also helped companies explore financing options for new technology adoption. AED staff are currently working with Bayer Environmental Science on consumer research to guide new product development.

**5. Technology Transfer:** AED worked with African companies on adopting new technologies to produce new and better products. The LLIN process developed with Bayer and Siamdutch was installed at Sunflag/Nigeria in 2009 with an initial capacity of 800,000 LLINs/year. The facility also includes a Quality Control lab equipped with an Agilent HPLC (high pressure liquid chromatograph) system. AED arranged for HPLC training for Sunflag's lab technicians, and it is now an integral part of Sunflag's LLIN quality control program. Mosquito Net Village in Uganda started full production of the WHOPEs-recommended Duranet<sup>®</sup> in December 2009. AED continues with discussions with companies in Africa and Asia that wish to adopt new technologies for the prevention of mosquito borne diseases and with the insecticide and net companies that are leading most of the research and development efforts. It will continue to play an important role as a catalyst in helping enterprises in developing countries produce products that improve the quality of life.

