

Protecting the environment by putting value on waste

Managing plastic waste in African cities



Working group on “Environment, Piemonte Region & Sahel”

In 1997, the Piemonte Region started a programme aimed at fighting poverty and bringing food security to Sub-Saharan Africa following an appeal launched the previous year by the FAO to undertake meaningful action against the hunger in the world. Today the programme covers nine African countries (Burkina Faso, Senegal, Mali, Nigeria, Cape Verde, Benin, Mauritania, Côte d’Ivoire and Ethiopia) and has come up with a series of interventions aimed at rural economic and socio-sanitary development in the knowledge of what a fundamental contribution public authorities can provide by undertaking such action.

The Piemonte Region has developed a strategy of intervention by developing collaboration through decentralized cooperation using the wide exchange of skills, experiences and resources between the public and private actors in a country (or a region), and the corresponding figures in a foreign country. This exchange is carried out within a shared institutional framework, built up by local authorities, thus enhancing the original contributions of those involved and increasing the impact of each activity.

This approach has allowed cooperation between local authorities and civil society and has supported the creation of networks involving those people who are not usually engaged in international cooperation but are endowed with skills useful to the project. Up to now, the overall activity in this cooperation can be summarised in the following figures which place the Piemonte Region among the first in Italy for the amount of funds disbursed:

- Funding of projects in about 50 countries.
- Overall management of around 150 projects a year.

- Annual investment of own resources of over 6 million euros.
- Further activation of resources from the Piemonte System of 7 million euros per year.
- Use of national and international funds.

Many projects funded by this program, submitted by NGOs, by local authorities and regional bodies, deal with urban waste problems, identified as a priority sector by the African partners, as environmental degradation is nowadays a cause of new poverty.

Strengthened by the success of such experiences, in May 2007, the Piemonte Region started a working group on “Environment, the Piemonte Region and Sahel”, which involves NGOs, municipalities, provinces, associations, universities and companies committed to waste management in Italy and/or involved in cooperation activities in this field in Africa. It’s an innovative strategy, since it combines actors from different fields and this diversity is much needed in order to capitalise on best practices, to develop ideas and original approaches, and to give more effective and better fitting answers.



This working group, directed by the Region, is led by LVIA NGO, in partnership with CISV and RETE NGOs.

Participants: COP, RE.CO.SOL, Co.co.pa, Municipalities of Torino, Galliate, Moretta, Carmagnola, Fossano, Piossasco, Vinovo, Pinerolo, Province of Cuneo, Fratelli della Sacra Famiglia, Chieri, Cidiu SpA, Amiat SpA, CIFA NGO.

Towns and new poverty



Following the rapid urbanisation of Sub-Saharan Africa, many Piedmont public and private bodies engaged in international solidarity activities chose to widen their strategies in order to face the problems of a population which is increasingly moving to African cities. In many cases, the internal migration has caught local administration unprepared, with the result that many neighbourhoods are growing fast without any basic services. The inhabitants of these neighbourhoods are the new poor: families who have emigrated from the countryside and are now living in degrading conditions in the suburban areas of the cities.

The first project was carried out in Senegal by the Piedmont NGO LVIA: in 1995, during some cultural activities on the outskirts of Thiès, people living in the Silmang neighbourhood asked LVIA's help in finding a solution to problems resulting from plastic waste dispersion. The use of plastic had boomed in African cities. For every day objects, plastics were cheaper materials than wood or metal, and packaging (plastic bags above all)

had become highly polluting because of their low quality production and their increasing use in shops and markets as a replacement for natural packaging such as baskets and textile fabrics. Plastic ended up invading the environment both inside and outside.

Pollution resulting from plastics was perceived as a **source of economic loss** and **food insecurity** because of soil depletion, with the subsequent decrease in agricultural production, the increase in livestock mortality due to ingestion of plastic bags and the ground water pollution. LVIA started up activities for plastic recycling which led, some years later, to the creation of **the first plastic recycling plant**, which has now been operating for more than ten years, **providing job opportunities, new revenues and environmental sensitisation.**

Today, Africa is the area most affected in terms of urbanisation. A recent report by UN Habitat found that the urban population in Africa will double by 2030, reaching 760 million. According to the report, in 2015 there will be 53 towns with more than one million inhabitants.

Young people are in particular the ones who emigrate to cities, in search of a job and economic stability. Many African governments are taking these trends into consideration in order to guarantee the necessary infrastructure with adequate urban development plans, and many municipalities are committing themselves to arranging waste collection, treatment and disposal plans, to suit the context of local needs.

Considering the growth of attention to this problem, **the Piemonte Region cooperation system, within the framework of the programme for food security and fight against poverty in Sub-Saharan Africa established by the Piemonte Region, is supporting the African municipalities in the setting-up and management of their environmental policies.** The interventions proposed by LVIA act within this framework. Following technical studies on social and economic local environments, they are promoting **plastic waste recycling as a means to fight poverty** and as an **area of social and**

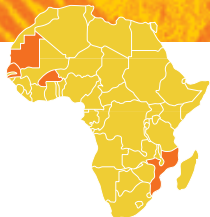
sustainable economic and environmental education for the development of a collective conscience for the need of rational management of plastic waste.

This proposal, thanks to its crosscutting nature (environmental, economic, social and educational) has generated interest in many African cities, and several municipalities have consulted LVIA in order to determine the feasibility of similar interventions. Up to now, plastic recycling plants have been created in Mozambique, Mauritania and, with the support of the Sahel Programme, in Burkina Faso and Senegal.

Using the results of such activities in Africa as a base, a programme of information and awareness raising has been promoted in Italy. This has led to decentralized cooperation with institutional, educational and technical exchanges between municipalities, associations and companies, as well as African and Italian schools, aiming, on one side, at improving the plastic recycling chain and, on the other, on spreading better environmental global awareness.

Cristina Daniele from LVIA with the women from the association in charge of the Centre for recycling in Ouagadougou, Burkina Faso.





Plastic recycling plants

Senegal

The Proplast plastic recycling plant has been in operation since 1998 in the town of Thiès (70 Km from Dakar). A similar plant was launched in 2002 in the town of Kaolack (190 km from Dakar).

Thiès, Silmang neighbourhood

Kaolack: Kundam neighbourhood, Kaolack



Burkina Faso

A plastic recycling plant has been in operation since 2005 in the capital Ouagadougou.

Sector 23, Nongr-Massom District, Ouagadougou



Mauritania

In 2005, the *Zazou* project for plastic recycling was launched in Nouakchott, through the start-up of a plastic recycling plant.

Hay Saken 1 Area, Darnaim, Nouakchott



Mozambique

L VIA has been working since 2006 in the biggest dump in Maputo through the activities carried out by *Recicla*, the plastic recycling plant, through *Fertiliza*, the organic waste recycling plant and through the project *Crianças da lixeira*, a centre focused on educational activities and school integration for children who used to frequent the dump.

Recicla and Centro Crianças: Hulene B Neighbourhood, Maputo

Fertiliza: Railway Neighbourhood, Maputo



The plastic recycling system promoted by LVIA, the result of a particular technical treatment, brings plastic waste back into the production cycle. The final product of the recycling process carried out in the plants consists of ground plastic or pellets (according to the specific treatment) which are sold to local enterprises and artisans who use them as raw material for the production of new items.

This system aims, above all, at **improving health in urban and suburban areas, at mitigating poverty, at meeting local social needs and at educating on environmental sustainability.** In the cities' suburbs, still defined by a semi-rural environment, to recycle plastic waste also means **to protect food security.** By removing this waste, the soil, which is less fertile when in contact with plastics, and livestock, which can choke to death by ingesting plastic bags picked up in the fields, are both protected.

The plastic recycling plants represent:

An opportunity to develop environmental and social entrepreneurship

The plants offer the chance to promote ways of sustaining economies which respect both environmental and social needs. Economic solutions are fitted to local contexts.

An opportunity for municipalities

The plants strengthen urban development plans prepared by the municipalities who are accountable for the environmental quality of the life of their citizens.



An opportunity for people to get new revenue

The plants buy plastic waste from the local population who thereby supplement their family income.

An opportunity of job

The plants create job opportunities for vulnerable groups, promoting training courses, professional follow-up and self-organization in cooperatives.

An opportunity for women

Women, in particular, are employed in the plants where they have an opportunity for professional growth and social integration.

An opportunity for environmental education

As part of the activities of the plants, educational and informational programmes on sustainable development are carried out, with activities in the neighbourhood, theatrical and musical shows, radio and television broadcasts, campaigns and educational courses in schools.

An opportunity of exchange between Italian and African communities

The institutional, technical and educational exchanges amongst municipalities, enterprises, associations and schools, which have been created around the centres, are the proof of decentralized cooperative activities between African and Italian communities. Particularly, in the framework of the "Sahel Programme" of the Piemonte Region, many local authorities, with the support of LVIA, have moved in this direction.

The recycled plastic production chain

Plastic recycling plants promote a production chain which is completely managed by local staff in all its different stages, from production to marketing. From a technical point of view, the plants are created according to economic and social feasibility studies, so that they better fit the different needs of local markets, providing the **best suited technical solution for the treatment of both hard plastic products** (bottles, basins, chairs...) and **soft plastic items** (bags, packaging, sheets...).

Purchase

Garbage is purchased from the local people, who collect and take it to the plant. At the plant, the plastic waste is sorted, weighed and paid for according to the quantity and to the type of material. In Senegal, Burkina Faso and Mauritania, several decentralized sale points have been created in some neighbourhoods.

In addition, the plants also treat firms' production waste. Firms bring their defective products to be recycled and then incorporate it back into their production cycle.



Storage

Waste is classified according to colour and plastic type and is stocked in stores which guarantee protection from atmospheric agents which may cause quality deterioration.



Washing

The pieces are dipped in water tanks in order to let impurities settle on the bottom. Afterwards, they are manually washed in basins using brushes and normal washing up liquid. The Proplast plant in Thiès has an electric washing machine which substantially saves time, water and washing up liquid.



Plastic processing

After cutting and washing, the process continues on to size reduction and the production of plastic fluff and/or pellets. These are the result of grinding techniques (using a grinder), densification (for light plastics) and extrusion (through a process of partial fusion of the plastic, enabling the production of pellets, the quality of which is better than the fluffs).



Cutting

Plastic items are manually cut in order to make them of manageable size and so that they are easier to wash.

Packaging and sale

Plastic fluffs and/or pellets are packed in bags, stored in facilities which guarantee protection from atmospheric agents, and then sold to local enterprises and artisans who recycle them into new items.



Environmental entrepreneurship for a sustainable economy

The economic impact of the plastic recycling plants can be outlined in four different areas:

- Job opportunities
- Income opportunity for the population
- Empowerment of the local market in recycled plastic products through collaboration with firms and information to the community on the opportunities in taking advantage of and buying these products.
- Promotion of social cooperatives in the environmental field, through professional empowerment of the plants' workers – both women and men.



Production of cesspools made from recycled plastic

Senegal

Firms involved: 10

End products: Cesspits, waste bins, bottles and caps (not to be used for food preparation) cable sheaths, basins, buckets, carpets, garden furniture, road signs, sandals.

The economic solution fostered by the plants' activities is shaped according to the local context and is based on previous social and market feasibility studies. We are talking about *environmental business* activities, the economic dynamics of which lead to an improvement of the environment.

In June 2009, an investigation by the French agency *Espere* found that the activities carried out by women working at the **Proplast plant in Thiès**, Senegal, in 2008, **prevented the production of 273 tons of carbon dioxide**, thanks to the recycling of 150 tons of plastic. The enterprises, in fact, used this product as a raw material, instead of using virgin plastic. In compliance with international environmental rules, *Proplast* will receive the equivalent sum in money, benefiting from the credits for the emissions saved.

End products of the plastic recycling production chain

The end product of the treatment carried out in the plastic recycling plants is ground or granulated plastic (according to the type of treatment) that firms and artisans purchase as a raw material for the production of new objects.



Burkina Faso

Firms involved: 12

End products: Chairs, waste bins, beverage crates, irrigation hoses, cable sheaths and shunt boxes, school kits (rulers, squares, protractors, stencils), photograph holders, sandals, drums, paperweights, cotton reels, manhole covers, road signs, hand wash basins.



Production of school kits made from recycled plastic

Within this context, LVIA promotes collaboration and exchanges between plants and enterprises in order to enable the centres to increasingly meet the needs of the market, supplying firms with a competitive product which meets both quality and quantity standards.

The Maputo case

In Maputo, some firms have provided training for the *Recicla* plant workers in order to improve their ability to meet the production's technical needs. This has been done through training courses in plastic types and in their correct selection, and through educational visits to factories to witness the grinding process. In addition, a firm has helped the centre in the maintenance of some of its machinery.

Mauritania

Firms involved: 2

End products: Cable sheaths, cases to be used in building, mats, buoys.

International exchanges between Italian and African operators in plastic recycling

LVIA has organized two international meetings in Dakar, with input from the Lombardy Region and the participation of ASSOCOMAPLAST (Italian National Association of Constructor of Machines and Moulds for Plastic and Rubber), involving businessmen, municipalities, government bodies, and public and private bodies of the plastic sector in Italy and West Africa. These meetings have encouraged technical and institutional exchanges to promote the plastic recycling production chain.

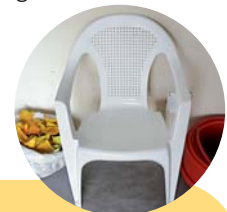
International meeting of Italian and West African operators in the field of plastic processing and recycling.
Dakar, Senegal - November 21st-22nd 2005

Workshop on "Social Business Accountability: current state and prospective"
Dakar, Senegal - July 24th-25th 2007

In addition, we would like to point out:

Workshop on "Environment and Recycling, Sharing Experiences"
Nouakchott, Mauritania - June, 17th - 18th, 2008
Promoted by LVIA, GRET, Urban community of Nouakchott, Ministry of the Environment

It is possible to look up the proceedings on the website www.lvia.it



Mozambique

Firms involved: 7

End products: Cable sheaths, beverage crates, chairs, basins, bottles and caps (not to be used for food preparation), buckets, clothes pegs, clothes hangers, jars, dustpans.

Towns fighting against waste

Administrative devolution policies put in place by many African governments are gradually delegating to towns new responsibilities that they are not always able to deal with, due to lack of resources or lack of skills in new unknown sectors. The UN programme for human settlement, UN Habitat, reports that, in the whole world, three billion people live in cities, one billion of whom live in deprived suburbs. Poor life conditions in an urban context weaken inner stability and UN Habitat highlights the need to improve the *governance* skills of the towns.

Among the strategies for strengthening the governance of these towns, the Piemonte Region, through the Sahel Program and with the support of NGOs, promotes the decentralised cooperation between public bodies and Italian and African communities. In this framework, institutional, technical and educational exchanges are developed in order to strengthen the technical, managerial and administrative side of the policies for the collection and recycling of waste on one side and the promotion of intercultural exchange, information and environmental education on the other.

In this way, the centres for plastic recycling contribute to a more sustainable management of the public dumps and strengthen the urban development plans and the social policies prepared by the local authorities. In fact, the plastic recycling centres, as conceived by LVIA, in addition to improving the health of the environment, promote the inclusion of the most marginalized part of the population into the labour market and are a way of fighting the new urban poverty because they represent not only an income opportunity but also an opportunity to protect food security and public health by removing plastic waste from the environment.

In Burkina Faso

The case of Ouagadougou and a pattern of decentralized cooperation with the Piedmont system

Rewarded in 2004 and 2006 with the *Premio Città più Pulita dell'Africa*, (Cleanest Town in Africa Award), the capital of Burkina Faso is very active in the reclamation of the urban environment. In the framework of the municipal plan for waste management, the first modern landfill in West Africa was inaugurated in 2005 in Senegal after which Ouagadougou had asked LVIA to evaluate the possibility of replicating this project for them. The first centre for recycling of plastic waste was then subsequently established in Ouagadougou, with the support of the Piemonte Region through the Sahel Program, the city of Turin, and the World Bank who had contributed to the project within the Development Marketplace Program. Later, the city took over the management of the centre in collaboration with the cooperative of women employed in the centre and with LVIA, which guaranteed its continued technical support. Other projects have been undertaken within the decentralised cooperation between the Municipality of Turin and





5-6 June 2008, Ouagadougou: "Open door days on the management and the recycling of plastic waste." Presentation of wastepaper baskets made from recycled plastic. From left to right: Amos Tincani, EU delegate; Simon Compaoré, Mayor of Ouagadougou; Emanuele Banfi, LVIA; Vincent Timbindi Dabilgou, Minister of Habitat and Urbanisation.

Ouagadougou, with the support of the Piemonte Region. In 2003, the two towns signed a cooperation agreement which designated LVIA as the mentoring body and promoted a technical collaboration between AMIAT (Multiservice Company for Environmental Hygiene Torino) and the Ouagadougou garbage collection department, and several sensitisation activities.

Since 2006, with the collaboration and the support of the Piemonte Region, the Fratelli della Sacra Famiglia Institute, Chieri and ASSOCOMAPLAST, the Handicraft Centre Sainte Famille of Saiba (near Ouagadougou) has purchased ground plastic from the plant and has produced school kits made from the recycled plastic, which are sold on the local market and offered to schools as a tool for environmental education.

In 2008, with the support of the Sahel Program and Assocomplast and the follow up of LVIA, the Cuneo

Province, together with the city of Ouagadougou, started a project of decentralized cooperation. In this project, the Burkinabè enterprise Faso Plast, using the ground plastic produced in the centre, produced 8000 baskets made from the recycled plastic, which were distributed by the Uagadougou municipality to schools and offices as an example of good environmental practice. Moreover, LVIA, in 2008, promoted among primary schools and colleges, with the support of the Piemonte Region and the Provinces of Turin and Cuneo, an educational tool: "Environment and solidarity... a set of rulers to get to know Burkina Faso".

Young people and the environment: decentralized cooperation between the Town of Ziniaré and the Province of Cuneo

Within the Sahel Program of the Piemonte Region, the Province of Cuneo and the Municipality of Ziniaré started a programme, which was followed by LVIA, of decentralised cooperation with the objective to encourage micro-enterprises, formed by young people, dedicated to the environmental sector and the promotion of international exchanges between young people.



The Maputo case, Mozambique

The Municipality of Maputo is very active in policies of environmental reclamation in the city and, thanks also to the collaboration of GTZ/AGRESU, has carried out a modern plan, technically state of the art, of waste collection and management; a new site has been located, far from populated areas, where a monitored landfill will be created, and waste collection has been organised in many areas of the city. A door-to-door collection has been carried out with municipal trucks in the Sommerschild neighbourhood and other areas have been provided with waste bins where people can drop their domestic waste and which are emptied on a regular basis by trucks.

The Municipality is a partner in the projects that created the *Recicla* plastic recycling centre and the *Fertiliza* organic waste recycling centre, and provided the land where the facilities have been built. The ownership of *Recicla's* facilities will be officially handed over to the Municipality in 2009. The centre will be managed for free and on a permanent basis by a cooperative of workers.



The President of Mozambique's wife, Maria da Luz Guebuza, visits the "Fertiliza" Centre. In the photo, Katia Ferrari of LVIA shows her the produced compost.

Senegal

A decentralized cooperation between Fossano and Joal Fadiouth, Galliate and Tivaouane Diacksao

In order to repeat what has been carried out in Thiès, two Senegalese villages (Joal-Fadiouth and Tivaouane Diacksao) together with two towns in the Piemonte Region (Fossano and Galliate), with the support of the Sahel Program of the Piemonte Region, have decided recently, to launch projects focusing on environmental reclamation and separate waste collection of plastic. The projects have already been started in both towns, the neighbourhood committees have been formed and some hangars have been built for the storage and the grinding of plastic. The plastic collected and processed is then intended to be sold to the *Proplast* plant in Thiès. At the same time, sensitisation programmes have been started for teachers, who will then undertake the environmental education of their classes.



Waste collection: an income opportunity for people

Over the years, it has been estimated that, every month, hundreds of people have removed plastic waste from the environment and sold it to plastic recycling plants.

Mostly, they are people living close to the centres responsible for the collection and the resale of waste. Latterly, some decentralised points of sale have been created in more distant neighbourhoods, in order to extend this opportunity to as many people as possible and to widen the collection area; at these points, waste is sorted, stored and then delivered to plants in order to be treated and recycled.



In **Thiès** and **Kaolack** (Senegal), eight local cooperatives are engaged in door-to-door waste collection in several neighbourhoods. They are carrying out separate collections of plastic using donkey-carts. In every neighbourhood, points of sale for plastic waste have been installed, managed by the cooperatives themselves. The waste is then sold to the two plastic recycling plants.

In **Nouakchott** (Mauritania), the collection system employs 1,500 women grouped in 130 cooperatives, who carry out a selective collection of plastic waste in two areas of the town (Darnaim and Toujounine). In order to optimise the management, the cooperatives have joined together in twelve networks, in order to let each of them have sufficient human and financial resources to manage waste pre-treatment units where the plastic is cleaned, cut and stored, waiting to be sold to the plastic recycling plant.

In **Ouagadougou** (Burkina Faso) a point of sale of plastic waste was set up in June 2009 in Sector 30, Bogodogo District, in the neighbourhood of the SIAO (International Art and Craft Fair, Ouagadougou).

Social cooperatives and work placement of vulnerable social groups



Plastic recycling centres create job opportunities for marginalised people, occasional workers, lacking basic education and, in some cases, illiterate. LVIA provides technical support and professional follow-up, promoting their self-organisation into cooperatives.

Thanks to the remuneration regularly guaranteed by this activity, women and men working at the centres have improved their financial status enabling them to better their children's education, to vary their nutrition and to improve their houses.

Women and men working at the centres have been involved in an education cycle, from **basic literacy** up to professional training, on **micro-business** and **plastic recycling techniques**. From the beginning, training has been focusing on **teamwork techniques**, in order to **encourage the self-organisation of groups and social cooperatives**. This has been an important step for the sustainability of the centres which engenders a more serious acknowledgement from institutions and a progressive sense of responsibility for the team. Today, the centres' workers have created formally acknowledged cooperatives and formal groups with an operational responsibility in the management of the plants.

Thiès, Senegal

Plant managed by GPF (Women's Promotion Group)
Laak Jom composed of 15 women.

Kaolack, Senegal

Plant managed by a GIE (Economic Interest Group)
Kundam composed of 12 men.

Ouagadougou, Burkina Faso

Plant managed by AFVDP (Women's Association for Plastic Recycling) composed of 30 women.

Maputo, Mozambique

Plant managed by a cooperative composed of 17 people, 9 men and 8 women.

Nouakchott, Mauritania

Plant managed by a GIE (Economic Interest Group) gathering 12 networks of 130 cooperatives composed as a whole of 1.500 women.

The case of the *lixeiros* of Maputo

Five kilometres from the centre of Maputo is situated the biggest waste dump of the city. Originally, its location was strategic, since it was in the countryside, but close to the city. Nevertheless, the urban population explosion, caused by the unstoppable flow of people escaping from the rural area's poverty and from the lengthy civil war, has brought the waste dump into the middle of what is now an overcrowded neighbourhood of the city. The continuous combustion of waste and the pollution of ground water is affecting a neighbourhood of about 60.000 inhabitants, in close contact with the uncon-



trolled dump. The city produces more than 1.000 tons of waste per day and the quantity increases every year, alongside the urbanisation of the country. Waste scavengers live and work in this environment. They speak halting Portuguese, many of them live in the waste dump and just a few have a family and a house. Their income is based on waste, on what they manage to collect - paper, iron, glass, plastics and food. There are about six to seven hundred of them, and some have lived there since they were children.

As a result, in the neighbourhood of Hulene B, where the waste dump is situated, LVIA has created *Recicla*, a plastic recycling plant, in cooperation with the municipality of Maputo, the support of the German Cooperation-



Gtz and of the Mozambican Caritas, and with the financial support of the Veneto Region. This project focuses on waste recycling as a social redemption opportunity for the waste scavengers and as a promotion of best practices in the management of urban waste. Today seventeen people, former waste scavengers, are working at *Recicla*. They have been involved in an instructive path aiming at strengthening the economical and managerial sustainability of the centre. The training started with basic education (literacy, group dynamics, personal hygiene, health education) and then progressed to more professional training on micro-business management, accounting, management of personnel and, obviously, plastic recycling techniques. People, who in 2005 were socially marginalised, have learnt to work as a group and in 2009 created, and are still managing, a formal cooperative.



Women, environmental protection and the fight against poverty



Italian cooperation promoted a conference on *Women in a Leading Role* which took place in Bamako, Mali, on March 2-3, 2007, in order to develop an *empowerment* program for women in West Africa, which could give value to the contribution that women can give to the development of society in Africa as well as elsewhere in the world.

L VIA, representing the group *Enviroment, Piemonte Region & Sahel*, took part in the conference using the experience of the plastic recycling plants as an example of the connection between *women's promotion, environmental protection and the fight against poverty*.

Nouakchott: 1.500 women in the plastic recycling cooperatives

In 2005, with the support of the European Union and in partnership with the French NGO GRET, L VIA started, in the city of Nouakchott, a project against environmental deterioration through the recycling of plastic waste. The first intervention was in Darnaim suburb, chosen as a priority because of its almost absolute lack of infrastructure and its social and environmental deterioration. Afterwards, the activities reached Toujounine, another problematic neighbourhood. Initially, it was decided to offer a professional training to some women's cooperatives which were already committed to social and economical activities in the neighbourhoods, so that they could also carry out the sensitisation, collection, treatment and sale of plastic waste. Through this daily job,

women attracted the community's interest in an activity which was improving on one hand the neighbourhood's hygiene and health conditions and, on the other hand, was also offering income generation opportunities. Today, 1,500 women grouped into 130 cooperatives organise plastic selective collection in those two neighbourhoods of the city. Thanks to the support of the project's partners, the women have improved their activities' organisation. The cooperatives are now grouped into twelve networks, each one composed of ten to twelve cooperatives, which have the human and economical resources to manage a warehouse for the preliminary treatment of plastic waste. Women, who were once called miserable, poor and illiterate, are stronger today, because of their action and their cooperatives which are well organised and recognised.

Ouagadougou: women plastic recycling association

In its environmental reclamation policy, Ouagadougou Municipality gives value to women's work. For more than a decade, 1.600 women of the *Brigade Verte* Association, on behalf of the Municipality, have had the



responsibility of the twice weekly cleaning of the major roads of the city. Moreover, with the plastic recycling plant, the Municipality has taken the opportunity to strengthen gender equality policies, through the selection within the *Brigade Verte* of thirty women to represent the different neighbourhoods of the city and different socio-economical criteria. After one year of activity, the women have created the Plastic Recycling Association (AFVDP) and today they are still managing the plant, with the support of the Ouagadougou Municipality and the technical mentoring of LVIA, supported by the Piemonte Region. Women are receiving a regular salary plus a production incentive. Thanks to the activity's income, they have set up a micro-credit system, which allows them to make investments and to meet their families' expenses. Women have gained a recognised position in society and have become, today, real businesswomen.

Within the framework of the women *empowerment* programme in West Africa, promoted by the Italian cooperation with the 2007 Bamako Conference, the Ouagadougou centre's women received funding aiming, on one hand, at strengthening their plastic recycling's activities and, on the other hand, at increasing their education and awareness of their rights.

Towards an environmental conscience

Within the framework of plastic recycling plants, educational programmes and information activities on sustainable development issues have been organized, together with activities in various neighbourhoods, theatre and music shows, radio and television broadcasts, awareness raising campaigns and educational activities in schools.

In many African areas, waste re-use is a widely spread practice, particularly in the poorest groups of the population. The sensitisation activities promoted by the Centres do not aim at informing people of the opportunity of reusing waste but aim at spreading awareness of managing plastic waste for the best, which otherwise is one of the main causes of environmental pollution and, as a result, the impoverishment of the quality of life.

Nouakchott

a national Campaign against plastic bags

"Nouakchott, a city without plastic". This is the commitment made by Mauritania's Ministry of the Environment, who, in January 2009, launched a national campaign against plastic bags together with LVIA, GRET, the women involved in plastic recycling, the districts and the Pizzorno Group of Nouakchott. This three month campaign involved more than 40.000 people: 47 meetings in the city's neighbourhoods, the distribution of 5.000 booklets, concert and theatre shows attended by 20.000 young people in schools and more than 10.000 people in squares and markets. Within this campaign, an advertisement in both French and Arabic was created, showing the environmental damage caused by plastic bags and the need for a rational use of them.

During the campaign, many artists joined the cause for free and spontaneously gave concerts and awareness raising performances. Among these were the Diddal Jaalal band, the El Chico rapper band and the Maison des Cinéastes which produced a documentary film. In addition, the Dragui Transport Company carried out a collection of plastic bags in the streets and in the neighbourhoods, providing forty staff members for the whole length of the campaign. With this initiative, the Ministry's intention is to educate both the population who use plastic packaging and its producers, in order to bring about a change in people's behaviour in relation to this polluting material.



Nouakchott. Campaign against plastic bags: a show to raise awareness.



*Ouagadougou.
School kits made
from recycled plastic
used in schools.*

Maputo

Environmental education Campaign

Since 2005, LVIA and Mozambican Caritas have cooperated with the local association Assamabh in a campaign for environmental education in primary and secondary schools in the Hulene-B neighbourhood through lessons, recycling workshops, street theatre, leafleting, information stands, thematic meetings and folk events. In 2007, new partners joined in: the youth association AJPJ, women's association AMJ and the Centro Terra Viva, an association formed by Mozambican biologists, environmentalists and jurists. Fifteen to twenty students, among the most active and interested, are chosen from every school to form the school's environmental club. The work done by teachers and headmasters, trained within the project, is voluntary.

The programme so far has involved forty teachers and eight thousand students. The courses allow the message to be spread as exemplified by *Recicla*, the plastic recycling plant, and *Fertiliza*, the organic waste recycling plant. Waste has an economic value and the environment has to be protected through correct waste management.

Ouagadougou

Recycled plastic school kits

In Saâba, a few kilometres from Ouagadougou, the Sainte Famille Artisans' Centre produces rulers, squares, stencils and protractors using, as raw material, ground plastic from the Ouagadougou plant. These four items make up the school kit which is sold on the local market and is given as a gift to classes visiting the plant and the Urban Park Bangre Weoogo for an environmental education lesson. Up until now, more than 700 guided tours to the plant have taken place thanks to the buses donated by Turin's Transport Group (GTT) within the framework of the decentralized cooperation activities between Turin and Ouagadougou.

World Environment Day: open door days on plastic waste recycling

Every year, participation is scheduled in World Environment Day. Particularly, on June 5 & 6, 2008, Ouagadougou Municipality and LVIA promoted the event "Open door days on plastic waste recycling", during which a local firm, Fasoplast, symbolically gave to the Municipality 8,000 plastic baskets, produced with the plant's ground plastic. The Municipality is now giving away these baskets to schools and public offices, in order to spread the message that it is possible to protect

Thiès. World Environment Day:
a play is put on by schools.

the environment and fight against poverty, through plastic recycling.

This was carried out within the project of decentralized cooperation between the Cuneo Province and the city of Ouagadougou, with the support of the Piemonte Region and Assocomplast.

Environmental education in schools

City schools are involved in environmental education programmes through class workshops held by the Urban Park Bangre-Weoogo's educational trainers and educational visits to the plastic recycling plant and to the park itself. Additionally, training sessions are organised for teachers. Students are given recycled plastic school kits, a useful support for educational activities as well as a tool for environmental education. Also, Italian and African schools from six different countries of Sahel, have been involved in exchange and training activities focusing on production, separate waste collection and recycling inside the initiative "From waste to resource", promoted by the city of Turin together with the NGOs CISV, LVIA and MAIS, and the support of the Piemonte Region and the European Union.



Awareness and media campaigns

The Brigade Verte women's association, with the collaboration and support of the Municipality of Turin and LVIA, puts on street theatre shows in the neighbourhoods of Ouagadougou. Additionally, there are on-going cooperation activities with local radios, with the Ministry of the Environment and with local film-makers in order to produce improved advertising and documentary films.

Thiès and Kaolack Children's Environment Day

Since 2003, with the initial support of the Piemonte Region and the Municipalities of Fossano and Bra and the collaboration of the Inspection Institute for National Education, LVIA has promoted training days addressed to primary school teachers, in order to provide them with appropriate education related to the environment. In 2007, an *Environment Day* was organised in Thiès, during which students explained what they had learnt through drama, poetry, singing and manual arts. Over the years, 1,200 children have been involved as a result of the activities carried out by teachers who had participated in the training courses.

Every year since 2004, street theatre shows on waste management and plastic recycling have been set up, involving local actors and neighbourhood associations.



Future perspective and focuses

It will be necessary for the **recycled plastic** to become an increasingly competitive choice on local markets in the future.

For this purpose, the NGO LVIA, due to its wide experience in this sector, identifies the following priorities and promotes them within the working group of *Environment, Piemonte Region & Sahel*:

- To promote national negotiation talks in order to develop a policy for the development of a plastic recycling production chain through economic, legal and fiscal benefits.
- To promote the production or importation of appropriate technologies which allow the speeding up of the production cycle of plastic recycling plants.
- To request the analysis of ground and granulated plastic produced by the plants by a plastic certification body, in order to give stronger guarantees to the sector's firms, which have to respect severe qualitative standards.
- To carry out technical and economic feasibility studies for the creation, the production and the sale of new recycled plastic products.
- To promote the use of renewable energy sources in the plants in order to decrease costs resulting from electric power and to minimise the environmental impact of the recycling processes.
- To improve management and business skills of the cooperatives and groups involved in plastic recycling: an important challenge as far as the social integration of the poorest and marginalised people and the activities' sustainability are concerned.

- To promote the collection and pre-treatment of plastic also in other cities, with a system referring to the plastic recycling plants.
- To support the plants in developing the balance of environmental impact, which would allow the calculation of the rate of recycled plastic/carbon dioxide's emissions to be avoided in line with international environmental rules.

At the same time, it is necessary to continue spreading correct information, leading to more sustainable and environmental-friendly behaviour.

For this purpose, the identified priorities are the following:

- To promote awareness raising campaigns with a strong impact in order to inform the population of the need to rationalise plastic use.
- To encourage the use of alternative packaging instead of light plastic packaging, in particular plastic bags.
- To encourage the development of other recycling production chains (paper and cardboard, glass, iron etc.) as an opportunity to create economy, to decrease waste management costs and to improve environmental quality.



Partners and financiers of LVIA's plastic recycling projects

SENEGAL

European Union; Italian Ministry of Foreign Affairs; Senegal Ministry of Environment and Nature's Protection; Environment and Territorial Planning Directorate; Departmental Inspection of National Education; Regional Hygiene Brigade; Lombardia Region; Emilia Romagna Region; Piemonte Region; Novara Province's Coordination of Municipalities and Associations for the Peace; Municipality of Bra; Municipality of Fossano; Municipality of Galliate; Permanent Committee for International Solidarity of Galliate; Municipality of Kaolack; Kaolack Caritas; Codeka; Embassy of Japan; Assocomplast; Polytechnic High School of Thiès.

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World Bank - Development Marketplace Program; UNDP (United Nations Development Program); European Union; Italian Cooperation; Ministry of Environment of Burkina Faso; Piemonte Region; Municipality of Ouagadougou; Province of Turin; Province of Cuneo; Municipality of Turin; Turin's Hill Park; Lame del Sesia Park; Urban Park Bangre Weogo; Fratelli della Sacra Famiglia Institute, Chieri; Sainte Famille Centre, Saaba; Assocomplast (Italian National Association of Constructor of Machines and Moulds for Plastic and Rubber); Nord; Visastamp; Tria.

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MAURITANIA

European Union; Urban Community of Nouakchott; the nine Mairies of Nouakchott; Pizzorno Dragui; Mauritanian Ministry of Environment

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MOZAMBIQUE

Municipality of Maputo; Veneto Region; Municipality of Verona; Municipality of Dueville; Italian Caritas; Mozambican Caritas; GTZ-Agresu; Etimos Association; Phambeni Makweru Association; Saaner Association; Parish Nossa Senhora Aparecida, Maputo; Hospital of Mavalane; Centro Terra Viva; Assamabh; AJPJ; AMJ.

We would like to point out, moreover, the linked project Fertiliza: Municipality of Maputo; Veneto Region; Municipality of Dueville; Embassy of the Netherlands in Mozambique; Embassy of Finland in Mozambique; CAFOD; Mozambican Caritas; Italian Caritas

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LVIA - Association of solidarity and international cooperation

LVIA is an Italian NGO, accredited by the Italian Foreign Ministry, as well as by the European Union. Founded in 1966, it is present in 11 African countries and in Albania where it operates within local communities enhancing their abilities and resources through projects. These include water, food, training, sanitary and environmental projects. In Italy, it promotes distance support, fair trade and cooperation between communities from the North and from the South.

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Piemonte and cooperation within the framework of waste management in Sahel

MAURITANIA

Nouakchott. Support to waste management and plastic recycling (project promoted by LVIA)

SENEGAL

Louga. Awareness raising and environmental education in schools (promoted by the NGOs CISv and RETE with the support of Turin Municipality and Piemonte Region).

Support to waste management and plastic recycling.

Thiès and Kaolack (promoted by the NGO LVIA, the Municipalities of Fossano and Bra, with the support of Piemonte Region).

Joal Fadiouth (promoted by the Municipality of Fossano, with the follow up on the NGO LVIA and the support of Piemonte Region).

Tivaouane Diacksao (promoted by the Municipality of Galliate, with the follow up on the NGO LVIA and the support of Piemonte Region).

NIGER

Niamey. promotion of plastic bag recycling; (promoted by the Municipality of Carmagnola and the network of solidly Municipality RECOSOL, with the support of Piemonte region).

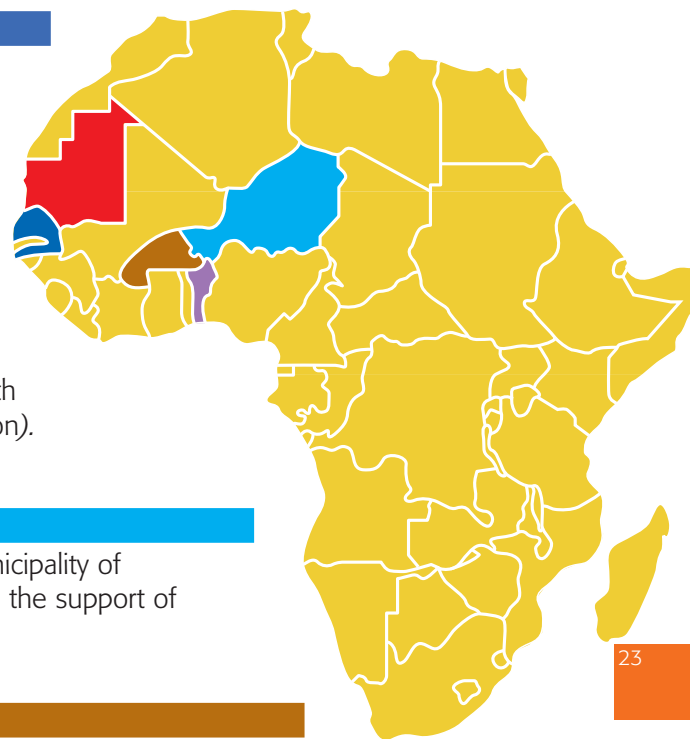
BURKINA FASO

Ouagadougou. Support to waste management and plastic recycling.

Awareness raising and environmental education in schools (promoted by the NGO LVIA, with an initial financing of the World Bank and the support of the Municipality of Turin, the Province of Cuneo and Piemonte Region).

BENIN

Bohicon, Ouidah. Support to waste management (promoted by the NGO CISV with the support of Piemonte Region).



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