

RIVERS OF WASTE - INDUSTRIAL POLLUTION; RETHINKING POLICY AND PRACTICE

Arati Davis

Abstract

Svaraj's working papers aim to highlight the concerns and issues being raised from our programme partners, and to engage stakeholders in working towards appropriate solutions.

This paper focuses on the ability of current policy and practice to effectively address the problems of industrial pollution and discharge in the water bodies of India. Industrial pollution affects drinking water sources, agriculture, and human health. Untreated effluent places greater stress on already diminishing water supplies.

The Patencheru Common Effluent Treatment Plant (CETP) was set up in 1994, in the Medak District of Andhra Pradesh in Southern India, to treat the industrial wastewater from the surrounding pharmaceutical industries. However, there is still little adherence to effluent treatment processes by industries in the region. Dumping of untreated or merely diluted effluents continues even today.

Hostile relations between industries, CETPs, and communities provide little space for negotiation and resolution of conflicts and concerns. GAMANA, a Hyderabad based ngo, has raised questions over the inadequacy of the current system. GAMANA is working with communities, in the Patencheru Area, to seek alternative models for multi-stakeholder pollution management.

Svaraj and the Swedish International Development Agency (SIDA)

Svaraj's water programme, developed with, and funded by the Swedish International Development Agency (SIDA), is a holistic, community centred, water resource management programme. At Svaraj we believe that, by putting communities centre stage in the water debate, we are capacitating individuals to effectively and equitably manage their own water needs. Svaraj's water programme currently operates in South India. Through our program work, policy debates, and working papers, we aim to mobilise different sectors of the community to debate the issues that affect them.

We are working with our communities to promote their voices within water management and to capacitate them to fight for effective water delivery mechanisms. Empowering community voices, we believe, is the first step towards good governance and substantive democratisation.

Water, water everywhere but not a drop to drink

The Government of India has identified 12 critically polluted river stretches, in the country. The Krishna, which is approximately 900km in length and passes through the states of Maharashtra, Karnataka and Andhra Pradesh, is one of these rivers. The Musi,

running through Hyderabad, Andhra Pradesh, and into which Patencheru Industrial waste is pumped, is a direct tributary of the Krishna.

- Seventy per cent of all available water in India is considered polluted.
- It has been estimated that approximately 73 million working days are lost due to water related diseases.
- The cost of environmental damage is estimated to be over 5 % of India's GDP. This is in excess of \$ 32 billion.
- India currently generates over 110,000 million litres of wastewater a day, and over 12,000 tonnes of hazardous waste.

With India's population already well past the one billion mark, and an industrial production annual growth rate of 7.4 per cent, waste generation is set to exponentially increase in the next 20 years. Proper treatment and discharge of industrial waste, and conflict resolution mechanisms for affected communities will become a growing need.

We cannot continue to operate on a 'business-as-usual' model. We need to clearly understand how far our current policy frameworks go in addressing the ground realities, and investigate alternative integrated management and operation systems, which deliver on effective pollution control for all.

CASE STUDY: Patencheru Industrial Area

PATENCHERU industrial area is located 15km outside Hyderabad city, in the southern state of Andhra Pradesh. Prior to 1970, there were few settlements in this area. However, since then, the Government of Andhra Pradesh has introduced incentives for industrial investment into the area. This has been done with the creation of 'industrial zones' such as the Patencheru Industrial Area, which cluster industries together, and provides attractive financial and administrative benefits for industries that set up operation within such zones.

Whilst development of industrial areas provides employment opportunities, it also results in increased employment migration by individuals, and subsequent settlement. Any untreated effluent into the water, will greatly affect the communities living closest to the industrial zones.

Prior to the mid-1990s, individual industrial units (IUs) were not required to comply with specific pollution control guidelines or environmental impact assessments. It was not long before untreated, hazardous effluents were being released indiscriminately onto the land surrounding the industrial zones.

When dumped into surface pits and water bodies, these highly toxic and chemical effluents seep into the groundwater. This has direct, negative consequences for drinking

water sources. Effluent dumped directly onto agricultural land, affects the physical structure of the soil. Untreated effluents increase the pH levels of the soil and this impacts the sustainability of plant life. The high chemical content of this untreated effluent degrades the productive capabilities of agricultural land.

It has been estimated that in excess of 7000 acres and 50,000 people have been affected by the untreated effluent discharged from IUs in Patencheru Industrial Area alone, (Murty and Prasad, 2000).

This liquid effluent seeps into the groundwater systems, enters the food chain, and causes severe health problems. Studies (EPW, 2002; Murty and Prasad, 2000) have shown a clear increase in the amount spent, per affected family, on medical costs and hospitalisation for polluted water related problems ranging from skin allergies, loss of vision, and respiratory diseases to cancer.

GAMANA, a Hyderabad based ngo, is collaborating with Svaraj to seek possible solutions to these problems. GAMANA's objective is to seek effective ways of effluent treatment and plant management, and to ensure that industry complies with the existing frameworks for effluent treatment. However, it is clear to GAMANA that mere enforcement of existing policy structures is not adequate.

Like many CETPs, Patencheru is under-capacitated to deal with the variations in the biological and chemical composition of incoming influents. Industries have no incentives to comply with existing policy, and affected communities receive no remuneration for lands laid bare by industrial pollution.

As a result, there is a standoff between existing stakeholders. A team from GAMANA and Svaraj met with farmers to discuss their concerns about pollution of their lands. Farmers indicated that they would rather sell their holdings, to the industries, than continue to crop on degraded and ravaged land. They have approached various industries with this proposal but still have not received any response, and continue to struggle to make ends meet. This hostile relationship has led to many demonstrations and even police involvement, to control the situation.

Multiple stakeholders, multiple stories

The case study of Patencheru is unfortunately not unique.

Untreated industrial effluent discharge into the Yamuna river, which travels through Delhi, reached such critical proportions, that the Supreme Court stepped in to formally ban all effluent discharge into the river. However, industries continue to dump untreated effluent into the river despite having on-site pre-treatment facilities. Samples, taken in 2004, of Yamuna river water quality, indicate that contamination levels are still well above the permitted levels. As of January 2004, there were 261 prosecutions pending, initiated by the Delhi Pollution Control Committee, indicating a gap between policy and practice in effluent treatment.

Industries are not the only ones at fault in this story. In the western state of Gujarat, the Vapi Industrial Development Corporation, a privately owned effluent treatment plant, has been targeted by activists and local community groups because of its pumping of

untreated chemical effluent into the local water sources. This has robbed fisher folk of their livelihoods as the discharge into the nearby water bodies has negatively impacted existing aqualife.

In this WORKING PAPER we will briefly outline the existing legal and policy structures for pollution control, and seek to explore possibilities for improving industrial pollution and discharge through alternate and integrated management options.

Pollution Control - law and policy in India

- Water (Prevention and Control of Pollution) Act of 1974 created the Central and State Pollution Control Boards.
- The Act states that the Central Pollution Control Board (CPCB) will serve as an advisory body to the Central Government, as well as the State Pollution Control Boards (SPCBs), on water pollution issues.
- The CPCB acts as a coordinating body for activities, trainings and monitoring of SPCBs.
- The CPCB sets the national standards for pollution control.
- The SPCB ensures compliance with the CPCB prescribed standards.
- The SPCB monitors compliance and penalises industry violations.
- Under the stipulations of the modified 1988 provisions, all information relevant to the 'public interest' should be made readily available by the SPCB to citizens.
- The Water (Prevention and Control of Pollution) Cess Act of 1977 provides incentives to industry to set up on-site effluent treatment plants.
- Concepts such as the 'polluter pays' and the 'precautionary principle' theoretically guide courts with regard to compensation for violating industries.

According to prescribed policy, all industrial effluent is required to be treated by a CETP. Effluent is monitored according to certain characteristics, such as Biological Oxygen Demand (BOD). BOD is an indicator of the oxygen demand that effluents have in water. Greater levels of BOD reduce the dissolved oxygen (DO) in water that is required for living organisms. Other indicators used for monitoring effluent are Chemical Oxygen Demand (COD), and Total Dissolved Solids (TDS).

Given the variations in both quality and quantity of effluent discharge by industries, the Andhra Pradesh Pollution Control Board (APPCB) has set parameters for incoming effluent into CETPs. This is done to standardize effluents coming in to the CETPs for treatment and discharge. The APPCB has specified that industrial units, which have effluent in excess of 1000mg/l of Biological Oxygen Demand (BOD), be required to pre-treat their effluents on site. Additionally, those industries discharging effluents at the rate of more than 40 kilo litres a day are also required to have their own, on-site, primary treatment plants.

Problems and costs with existing systems for pollution control in Patencheru

Despite the extensive legal and policy structure for pollution control within India, the efficacy of the PCBs, in ensuring safe, treated effluent discharge from both industries, and CETPs has been low.

One of the many problems with the existing regulation is that it operates on a 'one size fits all' basis. There is no flexible approach that differentiates between size and capacity of industries. There are over 3.1 million small to medium size industries (SMEs) in India compared to over 7500 large-scale industries. SMEs are credited with providing local employment opportunities, due to their lower capital requirements. They are also seen as promoters of indigenously available technologies (National Productivity Council of India).

However, 'end-of-pipe' technologies, such as on-site pre-treatment facilities, require high capital investment, financial costs, and specialised technical skills. Lack of access to these inputs creates a disincentive framework for many SMEs. This situation provides opportunities for both rent-seeking and/or direct defaulting of pollution control parameters.

Much of Andhra Pradesh's (AP) industrial activity takes place in its 272 industrial clusters. AP has over 3000 large and medium scale industries, with approximately 2170 small-scale industries. Patencheru Industrial Area has approximately 276 units involved in bulk drug processing and electro-plating activities.

In 1994, Patencheru EnviroTech Limited (PETL), a privately run CETP was opened by 120 member industries, at a cost of Rs. 94 million, and monthly running costs of Rs 4.5 million.

Summary of gaps in current policy framework

- Lack of incentives as a result of the existing policy structure by PCBs
- Lack of incentives as a result of the costing structure
- No separation technology for incoming effluent
- Non-participatory policy and process whereby affected communities have no 'voice' in management and monitoring mechanisms

Currently, an industry's production cost curve does not take into account the social costs of industrial pollution. The effects of industrial pollution on health and agriculture are considered externalities and indirect affects of pollution. These shadow prices need to be internalised within an industry's production costs, and not considered merely 'negative externalities'. In so doing, industry will become directly accountable to the communities they affect.

Principles such as the 'polluter pays' would be a first step to making industries, and CETPs financially accountable for their social and environmental impacts. The 'polluter pays' principle states that polluters should be accountable, and provide adequate compensation, to all affected parties of inadequately treated effluent and pollution.

The Arithmetic of Patencheru

- PETL has a maximum capacity to process 7.5 million litres a day of effluent, received from its member industries.
- PETL charges Rs 5000 per tanker for effluent treatment.
- In practice, PETL receives approximately 160 tankers of effluent for treatment per day.
- Each tanker contains, on average, 5,000 litres of effluent.
- This is a total of 800,000 litres per day.

As a result, PETL is currently operating grossly undercapacity.

Qualitative assessments indicate that the pricing of effluent treatment, at Rs 5000/tanker, is too high and acts as a disincentive for industries (Gamana).

To further complicate matters industries that are required to pre-treat their waste, rarely do so. This makes treatment difficult, as PETL does not separate incoming effluents according to their specific content. As a result, all influent, irrespective of its make-up, is treated in the same manner, and not necessarily effectively.

GAMANA's work in Patencheru

GAMANA will work to bring the pricing needs and realities of effluent treatment into line. CETPs like PETL are for-profit enterprises. It will be important to match the price of effluent treatment with the 'willingness to pay' on the part of industries.

GAMANA argues that providing incentives for industry to treat effluent, as well as giving community a part to play in the monitoring and management of effluent treatment, would go a long way in addressing some of the existing issues. Currently monitoring officials, industries, and community members are mutually independent stakeholders in PETL's effluent treatment management framework. This provides opportunities for rent seeking between stakeholders. Internalising the benefits of monitoring would also remove these incentives and create a more transparent and accountable system.

Multi-stakeholder management of ETPs, as an alternative management structure, is something that GAMANA is currently working towards in Patencheru. This system of management, especially with regard to CETPs, is uncommon in India. The United Nations Development Program has helped set up community managed ETPs for tannery clusters in Uttar Pradesh, India. In this system, the community, organised into a cooperative framework, monitor tannery effluents. Cooperatives, which bring together community members for a common purpose, are a popular organisational method in India¹ and are used for financial and non-financial purposes. They can lend money at

¹ See Appendix for more Information.

low levels of interest to their members, or they can serve as business advisory organisations. They present an alternative to strictly private or public sector operations.

Steps towards an integrated industrial pollution control framework

- Bring industry, government, and community to the same negotiation and management table
- Multi-stakeholder management systems whereby industry, community, and government are direct shareholders in ETPs and thereby have incentives to effectively operate and treat industrial pollution.
- The scientific and true-cost pricing of effluent treatment. Current pricing provides disincentives for treatment and results in increased dumping of untreated waste.

Remaining questions to be answered for effective effluent treatment

GAMANA is focusing on management mechanisms and incentives, through community awareness activities and conflict resolution processes. However, there are larger questions, with regard to current industrial pollution treatment, that will have to be addressed in GAMANA's work.

- **Appropriate Technology** - even if CETPs were to work effectively, current treatment does not remove heavy metals and other carcinogenic materials. Current technology does not treat micro-pollutants.
- **End-of-Pipe vs. In-pipe Solution** - CETPs are considered 'end-of-pipe' solutions, and thereby have limited efficacy. It has been argued that focus should shift from these solutions to input solutions. This would be the use of safe, clean chemicals in industrial processing.
- **Informal Strategies** - beyond CETPs – is it possible to use informal mechanisms, such as community activism and media awareness, to check industrial actions? These are effective, short-term remedies. The MV Foundation, Hyderabad, has used informal mechanisms, such as institutional studies and international media, to push multi-national seed companies into action regarding child labour. Can GAMANA work with end users of Patencheru's bulk drug industry to create effective pressures for pollution compliance?

APPENDIX

Cooperatives - mixed success story

Cooperatives, in India, are formal registered bodies, and fall under the monitoring and guidance of the National Cooperative Union of India. The United Nations considers cooperatives a vital pre-requisite, especially in developing countries, for the development of local civic consciousness, and the practice of sustainable development.

There are over 600,000 cooperatives in India, with over 230 million members whose activities encompass agricultural production, agri-business, non-agricultural groups, women's groups, and many others. A cooperative framework is one that allows small to medium scale farmers, community groups, entrepreneurs, to make profits by providing an alternative pathway between private sector large-scale capitalism and growing public inefficiency in resource and service delivery.

The overarching principle of the cooperative is that its' activity should result in the equitable distribution of benefits amongst its members. The group nature of the cooperative system allows for strength in numbers. If successful, cooperatives can offer numerous benefits to its members in the way of employment creation, market control, education, and skill development. However, unlike a private-sector enterprise, concentration of profit is not the key motivating factor of the cooperative, rather it is its focus on group activity that provides social and economic upliftment for its members. In this way the cooperative straddles principles conventionally held in both the private and public sector.

The Amul Experience

India's milk industry provides one of the most enduring examples of a successful cooperative system. Its' success stems from its use of both effective management styles, as well as relevant and up to date technology.

- In 1946, the Khira District Milk Cooperative, under the visionary leadership of V.Kurien, created the brand Amul.
- Production and processing are decentralised down to family units.
- Transportation and value-addition of products are done at a central location.
- Veterinary care is provided for the member farmers' livestock.

There are over 10.7 million farmers that are part of India's existing dairy cooperatives. The Amul model raises profits, which are then channelled back into the community, by providing holistic services for its members.

It is Amul's mix of decentralised, community-centric management systems and modern technology that make it such a successful story.

Extending the success of Amul

A similar marriage of management and technology is one of the key reasons that the Solid Waste Company of Southwest Scania (SYSAV), a regional waste service company, in southern Sweden has been able to process, treat, and recycle the domestic and industrial waste of 500,000 inhabitants and industries. SYSAV is jointly owned by nine municipalities, (Sweden's local government bodies). Each municipality determines the fees for wastewater services and public water. The fees for such services go directly to SYSAV's own investment, capital and running costs.

SYSAV's organisational structure allows for comprehensive treatment of waste. Subsidiaries, each of which deals with a different aspect of pollution treatment, effectively delegate and decentralise work. SYSAV uses state of the art technology, provided by a private supplier to monitor emissions, and ensure industry conforms to strict environmental regulations and meets International Standards for Organisation (ISO), which cover production processes, human resource policies, and environmental management systems.

The management success of SYSAV is also due to the political will of the Swedish government, and its people, to support a long-term sustainable pollution control strategy. According to Swedish legislation, SYSAV has been deemed a not-for-profit entity. Political support from the Swedish government and citizens, also acts as an informal checking mechanism on potential industrial violators.

Lessons for India

Comparatively, although appealing on paper, in India the cooperative movement has been internally politicised and fragmented. In theory, the cooperative movement should exist as an autonomous framework for action and self-governance, boosted by external political support. Within India however, many of the top apex cooperative bodies have been taken over by politicians. Lack of training of members and lack of access to needed markets has inhibited the success of cooperatives. Amul remains one of the exceptions of success to the cooperative story.