1. MANAGING WATER RESOURCES -
Reducing Water Pollution and Improving Water Supply

**Problem Statement:** Shenyang has a serious water resource problem. Supply has not satisfied demand for many years, resulting in serious groundwater over-abstraction as well as escalating costs in providing a piped water distribution system. Discharged effluents continue to pollute the Rivers, primarily from industrial but increasingly from domestic and agricultural sources, conflicting with both short and long term water supply systems and proposals. This pollution drastically reduces the water supply quality and increases its cost (by requiring more expensive treatment, as well as the tapping of sources far away); it also limits other development opportunities, especially in recreation. Moreover, these additional costs (and lost development opportunities) are not faced by those who actually cause the problem; instead, these costs are borne by other stakeholders in the city. The situation is made worse by seasonal fluctuations in the water flows of the main rivers.

**Possible Focus of Interventions for Working Groups:**

1) **WG to Reduce Pollution at Source** - This would target total load control and the promotion of recycling efforts by targeting major polluting industries to increase on-site pre-treatment. Other interventions would include: Publicising, promoting and gradually enforcing "Cleaner Industrial Production" technologies and processes. Reducing effluents from other major sources - hotels and institutions. Exploring potentials for technology transfers as well as the role of local science and technology institutions. Strengthening enforcement of "polluter pays" principle, and increasing the level of charges. Introducing/publicising new domestic sanitation methods (such as half-flush toilets, phosphorus free detergents). Assessing ways to strengthen enforcement of existing laws, and reviewing the needs for new supporting legislation. Pressurising worst offenders through adverse publicity.

2) **WG on Accelerating Wastewater Collection, Treatment and Recycling** - Extending sewer connections to key pollution sources around sensitive water sources, using special interceptors where necessary. Accelerating the programme of treatment plant construction for most sensitive locations. Replicating/strengthening the experiences of treatment for recycling, both within industries and for dual-use (such as greening the City). Reviewing investment needs and available resources in coordination with on-going investment programmes (municipal, World Bank).
3) WG on Protecting Existing and Expanding other Potential Water Sources - Decommission some of the groundwater sources through industrial recycling (where CP technologies provide an opportunity), and/or increasing the reuse of treated wastewater. Provide local interceptor sewers "upstream" to divert wastewater away from sensitive areas. Increase water treatment. Monitor and control agricultural fertiliser use and divert polluting run-off. Introduce and strengthen enforcement of water-shed management (industrial effluent disposal, illegal dumping, etc). Increase public awareness of need to protect key water sources. Strengthen the capital investment programme to develop new water sources and their transmission.

4) WG on Reducing Water Demands and Losses - Introduce new irrigation practices so more water is available for urban use from existing storage systems. Strengthen metering system and increase prices, introduce pricing differentials to hit the largest consumers most so they become more responsive to pricing as a management mechanism. Increase investment in leakage control. Further develop water saving engineering.

5) WG to Strengthen Development and Land-Use Control Coordination - Strengthen coordination with land-use planning of all sites adjoining the rivers. Create new methods of monitoring urban development in sensitive areas and for more effectively enforcing relevant controls. Take initiative in organising forum to promote non-damaging and suitable forms of development.

Next Steps:

Follow the general procedures for establishing and operating Working Groups, as will be discussed in detail. (Assign staff from public sector institutions that can be immediately identified as having the responsibilities, information, expertise, resources, and implementation instruments necessary; review and assess the range of interventions to identify those to be taken up through the Working Group; review existing and potential projects/programmes; determine most important "leverage points" for intervention, both geographically and institutionally; etc...)

This is really prioritising specific short and medium term actions (the HOW and the WHERE), along with identifying more clearly WHO should be in the Working Groups. Gradually expand the Working Groups to include representatives from those industries (and other polluters) whose support will be needed to reduce pollution. In this way, through more interaction, understanding and thus committed action, the coordinated management of water resources will gradually be improved.
2. MANAGING AIR QUALITY (AND URBAN TRANSPORTATION)

**Problem Statement:** Although positive actions have been taken to reduce/stabilise air pollution (esp. TSP) through coal fired and other industrial emissions, the contribution to air pollution from motor vehicles has been rising steadily. A variety of inter-related actions will be necessary to bring motor vehicle pollution under control: reduce per-vehicle emissions, reduce traffic congestion through proper traffic management, improve public transport, increasing City Greening, etc. Successful coordination of these interventions can help reduce air pollution, improve safety, reduce noise, improve urban mobility, and enhance the attractiveness of the city. Recognising the need to coordinate such interventions, five Working Groups could properly be established.

1) **WORKING GROUP ON REDUCING VEHICULAR EMISSIONS:**
**Possible Interventions:**
1) Strengthen public awareness of need for better vehicle maintenance.
2) Agree standards and implement techniques to control emission levels of new vehicles.
3) Agree standards for old vehicles, incl. programmes for scrapping.
4) Steady implementation of programme for unleaded fuels.

2) **WORKING GROUP ON IMPROVING TRAFFIC MANAGEMENT:**
**Possible Interventions:**
1) Introduce more channelisation, intersection improvements, and signalisation.
2) Introduce and strictly enforce more rigorous parking controls.
3) Extend exclusive pedestrian and bicycle rights-of-way, esp. in smaller lanes and streets.
4) Increase traffic separation, in major roads/intersections.
5) Recapture road and sidewalk space by enforcement of regulations about encroachment.
6) Strengthen programmes for driver education.

3) **WORKING GROUP ON IMPROVING PUBLIC TRANSPORT:**
**Possible Interventions:**
1) Reorganise and recapitalise the bus fleet, with perhaps joint ventures, and with emphasis on modernising system management.
2) Identify suitable routes for exclusive bus lanes.
3) Introduce variety of bus types (and perhaps charges) for different routes.
4) Implement strict enforcement system for bus driving behaviour.
5) Introduce and integrate other public transport modes - Rapid Transit Systems using existing rail trackage.

4) **WORKING GROUP ON REDUCING OTHER AIR POLLUTION:**
**Possible Interventions:**
1) Consolidate controls over coal burning, including introduction of de-sulphurising equipment and strengthen introduction of cleaner energy production and use policy.
2) Agree main air emission sources to be addressed and take advantage of relocation policy.
3) Support intro of Cleaner Production techniques and investments
4) Strengthen "polluter pays" enforcement, and increase costs to main offenders.
5) Coordinate with industrial re-location strategy.
5) WORKING GROUP ON GREENING THE CITY:

Possible Interventions:
1) Consolidate development of tree nursery - with appropriate species.
2) Undertake public awareness campaign, involve neighbourhoods and commerce in tree planting (and maintenance) schemes.
3) Strengthen land use controls against the use of committed green space, and enforcement of green land use standards.
4) Strengthen partnership planting schemes.

Next Steps:
Establish five Working Groups: Reducing Vehicular Emissions Working Group
Improving Traffic Management Working Group
Improving Public Transport Working Group
Reducing Other Air Pollution Working Group
City Greening Working Group

Follow the general procedures for establishing and operating Working Groups, as will be discussed in detail. (Assign staff from public sector institutions that can be immediately identified as having the responsibilities, information, expertise, resources, and implementation instruments necessary; review and assess the range of interventions to identify those to be taken up through the Working Group; review existing and potential projects/programmes; determine most important "leverage points" for intervention, both geographically and institutionally; etc...)

The Working Groups will work directly on prioritising specific short and medium term actions (the HOW and the WHERE), along with identifying more clearly WHO should be in the two Working Groups. The Working Groups will be gradually expanded to include representatives from additional organisations ("stakeholders") whose involvement is important for the priority interventions which are selected.
### Problem Statement
Rates of solid waste generation are rising as are the costs of collection and difficulties of safe disposal. There is a need to reduce public sector costs of collection so these resources can be invested elsewhere in addressing the problem, to increase recycling of reusable materials (especially at source), and to improve waste disposal capacity (especially through sanitary landfill, and the proper segregation and treatment of hazardous industrial and hospital wastes). Based on the deliberations of the City Consultation, it would be suitable to have three Working Groups, focused on three aspects of the issue: Collection, Recycling, and Disposal.

<table>
<thead>
<tr>
<th>COLLECTION WORKING GROUP</th>
<th>RECYCLING WORKING GROUP</th>
<th>DISPOSAL WORKING GROUP</th>
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<td><strong>Possible Interventions:</strong></td>
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<td>1) Establish separate Collection Companies.</td>
<td>1) Develop household waste separation scheme, perhaps beginning in a selected area in association with a new Collection Company.</td>
<td>1) Strengthen sanitary landfill site development, including mobilisation of resources and detailed technical studies on groundwater and other environmental impacts.</td>
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<td>2) Develop neighbourhood organisations to complement and support local collection.</td>
<td>2) Develop specialised waste separation schemes for hotels, restaurants, and other institutions.</td>
<td>2) Review the role of other potential technologies (especially for hazardous wastes).</td>
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<td>3) Rationalise and strengthen system of consolidation (transfer stations, temporary storage facilities, etc.).</td>
<td>3) Strengthen and support existing formal or informal recycling activities, at transfer stations, disposal sites and elsewhere, including strengthening of connections between existing (and proposed) recycling networks and the industrial users and markets for reusable goods.</td>
<td>3) Develop terminal facilities for separation, for recycling and for treatment of hazardous wastes.</td>
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<td>4) Institute or strengthen system of charges for collection, especially for non-residential areas, together with strengthened enforcement system.</td>
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<td>4) Support and strengthen existing sanitary landfill proposals (promote joint venture development, new recycling technologies).</td>
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<td>5) Public awareness support campaign.</td>
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<td>5) Introduce disposal charges, together with system for controlling illegal dumping.</td>
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