Climate Technology Centre and Network (CTCN) Technical Assistance for the Development of an Urban Adaptation Plan for Kurunegala

Capacity Gap Analysis Report

"Identification of Capacity Building Needs"

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The Climate Technology Centre & Network (CTCN) has provided Technical Assistance through pro-bono support from Korea Environment Institute (KEI) Korea Adaptation Center for Climate Change (KACCC) and Green Technology Center (GTC) to prepare an Adaptation Plan and to assess climate change vulnerability and risk of the Kurunegala city.

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Capacity Gap Analysis: Identification of capacity building needs

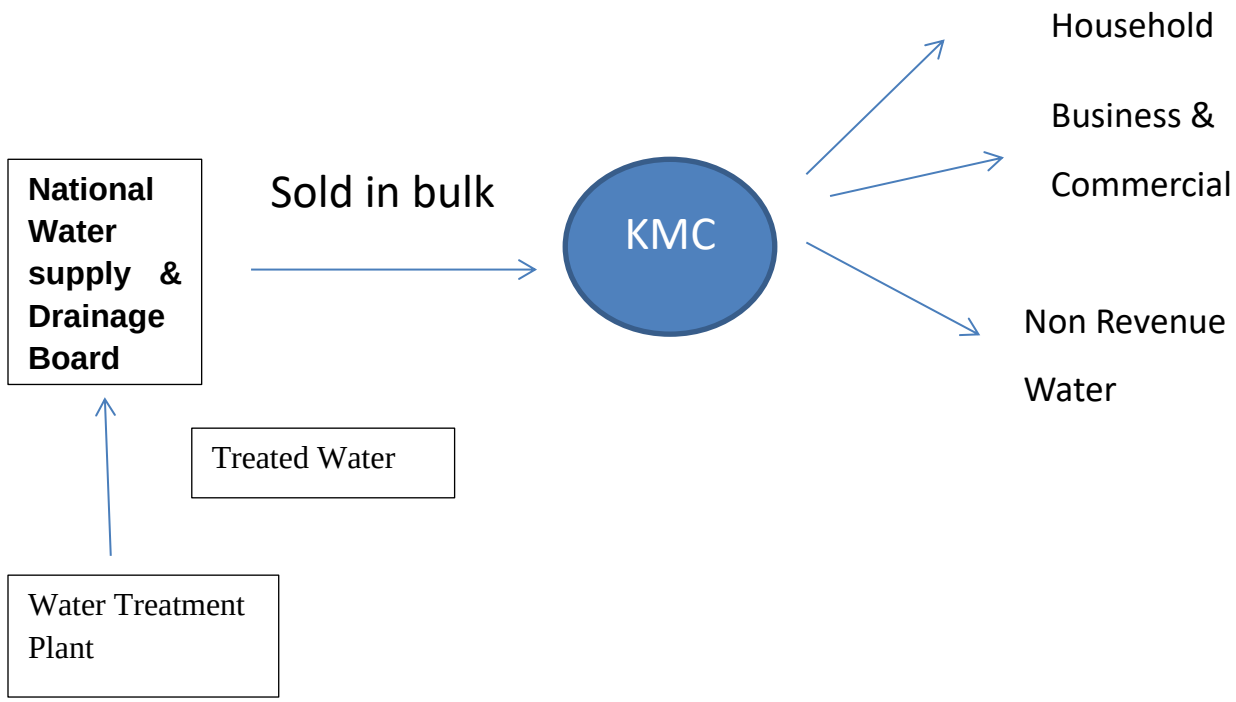
(Water and Heat Sectors)

Questions raised at the workshop:

(1) What are the main gaps and obstacles that prevent Kurunegala city from becoming a climate smart and resilient city in the context of climate change adaptation?

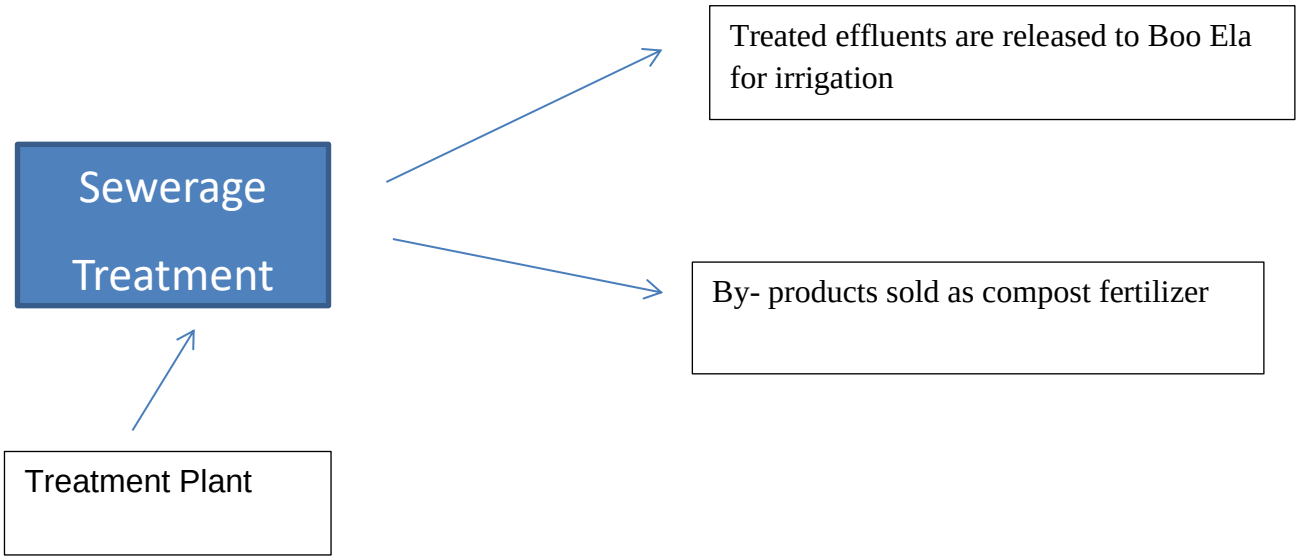
(2) What are the capacity building needs required by your institution to overcome the above issues in (1)?

1. Process of Water Treatment and Distribution



Treated water is pumped from the water treatment plant to the National Water Supply and Drainage Board which sells the water in bulk each month to the Kurunegala Municipal Council (KMC). The water is distributed to the households, commercial and temples, schools and orphanages (Non-revenue water).

2. Sewerage Treatment Process



Sewerage lines from households, institutes and commercial units are linked to the main treatment plant. The sewerage is treated first, and then the treated effluent is tested and released to the Boo Ela for irrigation purposes. The by-product is sold as compost fertilizer to agricultural farms after completion of the test.

3. Preliminary Stakeholder Mapping

3.1 National Water Supply and Drainage Board: Kurunegala Operational Unit and Water Treatment Plant

Objective: To provide high quality water to the community.

Has all Human Resource necessary for the implementation of production of high quality water and distribution. Plans are updated every 5 years. The both of the water treatment facility and the sewerage treatment facility are under management of the National Water Supply and Drainage Board. Tapping of groundwater is not encouraged. It is necessary to obtain approval before tapping into ground water sources.

Water quality databases are maintained. There are no laboratory facilities to measure and treat heavy metals in water. Ample opportunities are available for students to collaborate in research.

During the drought season, water is pumped from the Kurunegala Wewa. Due to heavy bacteriological intrusions, it is very costly to treat this water.

Since one of the main issues is a lack of an additional water source during the drought season, a TATA (India) funded Water Resource improvement-project has been designed to obtain water from Wandurapinu ela. The feasibility study is going on. It is the seasonal stream hence there is an issue in the availability of water throughout the year.

Capacity needs;

1. Expansion of laboratory facilities to check for heavy metals and their treatment.
2. Technology for treating heavy metals.
3. Less costly treatment technology for treating bacteriological intrusions.
4. Funding to expand laboratory facilities.
5. A visitor centre to be established to provide information to schoolchildren regarding the water treatment plant.

3.2 Sewerage Treatment Plant

Legislature: Existing legislature needs to encourage residents to connect their households to the main sewerage line.

Objective: To treat sewerage and release non-toxic effluents.

New plant design is in progress which includes future line extensions. Currently, the plant has a capacity of 4,500m^3 per day. The effluent is treated to adhere to the regulations of the Central Environment Authority. Network includes 16,000m^3 per day. At the moment, 3,700 connections have been established from the project. Coverage should be 7,000. All households and commercial institutes etc. It is necessary to be joined to the sewerage network. For the next 5 years, the plant facilities are adequate for sewerage treatment.

Capacity needs:

1. Funds necessary to cover the line connections of entire KMC
2. Considering population increase it is necessary to build another sewerage treatment plant (Water Board has acquired land for another plant). But funds are necessary to build the plant (Pond System).
3. Laboratory facilities need to be expanded and new equipment obtained to assess the heavy metals and their treatment.
4. Opportunities are available for student research and would increase with the expansion of the laboratory facilities.

3.3 Kurunegala Municipal Council

Legislature: There are no laws to penalize those who take water illegally from the pipe system.

Objective: KMC has lots of roles and responsibilities. Its primary responsibility for water is to ensure distribution of potable water to all residents and institutions within the KMC boundary. Distribution of water during the drought is also included.

Water is bought in bulk from the National Water Supply and Drainage Board and distributed through lines. Water Meters are fixed in all households and institutions for which water is supplied.

Database containing all information on distribution is available. The Non-Revenue Water is approximately 60%, which is too high. The KMC has identified approx. 2,000 faulty water meters and leakages. Old lines that need to be replaced are used more than 30 years.

During the drought, there are water cuts and water is provided in Bowsers for some households. Temporary water storage containers (e.g. barrels, cement tanks) may contain dengue larvae ('Abate granules' are put in some storage tanks where water is only used for washing purposes). Regular dengue inspection is carried out within the KMC.

Storm water drainage plan is being designed. This plan identified 5-6 areas for temporary storage and proposed new buildings to incorporate rain water harvesting tanks underground (has to be adopted as a regulation). Green building guidelines could be applied (need regulations and need to be adopted according to Kurunegala status).

No greening plan has been adopted. There is no capacity to identify the plants and areas. It is needed to coordinate with other institutes such as the Road Development Authority (RDA), Urban Dvelopment Authority (UDA), sewerage, water, electricity and forest Department etc. to implement this program. Staffs are required for this.

It is necessary to encourage institutions to grow trees within their space. Kurunegala town contains many government areas and buildings. This needs to be incorporated as a regulation into the government institutions as well. Since no regulations are applied to government buildings, the resources in the green area are restlessly used to construct more buildings. There is no coordination committee.

Capacity needs:

1. Institutional structure needs revision. It is necessary to increase cadre to handle the issues that arise with respect to climate change.
2. Need to increase trained professional and technical staff.
3. Amendment required to the existing legislature to penalize those who take water illegally from the pipe system.
4. Need to replace old lines.
5. Need to replace faulty water meters.
6. Sewerage plant releases 4,000m^3 of treated effluent per day. This could be sent in a separate tap line for use of washing etc. to the hospital or to institutes.
7. Water Treatment Plant also releases effluent. If a separate line could be laid, this water could be sent to households for washing purposes.
8. No control when tapping ground water.
9. Weakness in administration and financial regulations which delays quick implementation
10. Need to construct rainwater storage tanks in the 5 identified areas.
11. Need new regulations for adoption of green building guidelines adopting the guidelines in accordance with the situation in Kurunegala, construction of underground rainwater storage systems for new buildings; reserving greenery areas in all newly constructed institutions and existing government organizations.
12. Adoption of a greenery plan

13. Training necessary for people to understand the importance of preserving greenery in town, urban forestry, how it is an adaptation for climate change.
14. Lack of coordination among institutions and role identification.
15. Lack of funds to carry out the above needs.

3.4 Meteorology Department

Objective: To collect meteorological data from station and submit to Head Office.

Data collected is: temperature, rainfall, wind speed and direction, humidity, dew point, vapor pressure, air pressure and cloud data.

Capacity needs:

1. Currently only two officers at the station (Understaffed).
2. Require at least two more trained staff members to collect night-time data.

3.5 Urban Development Authority

Objective: Physical development of the Kurunegala area.

The Master Plan (2020-2030) has been designed including the features from the National Physical Plan. It is necessary to incorporate climate change aspects into the planning. Most planning is not completed at the regional level. Zoning plan is completed. In order to reduce traffic congestion, it is required to establish two city centres. One for service needs and the other for transport needs. Therefore, a multi modal traffic centre and multi store car park are envisioned, but lack of finances holds up the design.

Capacity needs:

1. Training for climate modelling
2. Depend on funding from the Central Government to carry out development projects.

3.6 Road Development Authority

Objective: To design and implement road network system

In order to construct roads, land acquisition is necessary. This process takes a very long time. Universities are involved to administer traffic counts etc. One of the major projects is to build the expressway which goes across Kurunegala. Greenery aspects are considered in all Roadway projects. A separate division (Environment Division) has been established to look into matters pertaining to the environment.

Each year an action plan is prepared other than the master plan. This covers the entire province. Greenery is considered in the plan.

Out of the town limit a new outer circular road which crosses the 5 major roads has been considered to reduce traffic congestion.

Capacity needs:

1. More staff for quality control lab.
2. Capacity building for Environment Division in respect to climate change adaptation and mitigation
3. Introduce adaptation technologies that can be applied to Kurunegala.

3.7 Land Use Policy Planning Department

Objective: To update Land Use plan every 5 years. Currently 1: 10,000 scale mapping is used

Capacity needs:

1. Staff needs to be trained on GIS
2. Need equipment to map to 1: 5000 or 1: 2000 scale.
3. Software needs.

3.8 Forest Department

Objective: To maintain and conserve the forests within the Kurunegala boundary.

Capacity needs:

1. Need coordination to inform institutions and people on what plants to grow
2. Lack of funding to conduct awareness programmes.
3. Community programmes need to be conducted to inform people on the importance of forests and get the communities to grow trees in their lands.
4. Need capacity building training on climate change impacts and importance of forestry
5. Capacity necessary to calculate carbon sequestration. Necessary to inform communities why it is necessary to grow the trees

3.9 Irrigation Department

Objective: To conduct activities at Provincial level.

Annual action plan is followed. Instructions from Head Office are incorporated into planning. Head Office coordinates the major projects. Current, ADB project on river basin assessment and rehabilitation includes the Deduru oya. Flood control maintained at Wilgoda Anicut. Wedaru wewa rehabilitation programme is conducted to improve the reservoir for drinking water purposes. Involvement in District committee, kanna kamituwa, to decide on distribution of water for irrigation and drinking purposes.

Capacity needs:

1. Research is conducted at Head Office level. Need to have facilities and conduct research at Provincial level.
2. Feasibility studies need to be conducted on available sources of water.
3. Funding necessary to conduct above activities

3.10 Department of Local Government

Objective: To attend to the administrative matters in the Province as well as monitoring and evaluation and coordination including advisory capacity.

KMC and other 32 Local Authorities comes under the Department of Local Government. Has the mandate to support in activities such as the increase of cadre of KMC.

It is necessary to create legislature to take climate change action. Even though there are laws related to water there are no laws for reducing heat stress within the cities by taking appropriate measures.

Capacity needs:

1. Propose by-law on spot fining for illegal water usage
2. Internal capacity building and enhanced know-how on climate change
3. Technologies and equipment for maintaining databases
4. Establish GIS section to cover all 32 Local Authorities

3.11 Provincial Council: Agriculture

Objective: Monitoring, evaluation, implementation of projects related to agriculture

Annual action plan is implemented for province. Research and development are conducted at Central Government level.

Capacity needs:

1. Research needs to be conducted at Provincial level
2. Require rules and regulations at city level.
3. Funding issues to implement urban agriculture, food and nutrition, organic farming, etc.
4. Need to conduct programmes to encourage organic products and home-grown products.
5. No climate related programmes with respect to encouragement of urban agriculture.

3.12 Grama Niladhari (Administrative Unit)

Objective: Ground level implementation of programmes.

Monthly meetings are held to discuss issues. Annual action plan reflects them. It incorporates action sent by other ministries, such as Environment Ministry's dengue programmes etc.. Information flows from community to organizations. Regular data such as population growth etc. and basic information gathering are conducted. Can update data collection with climate related data. Has already commenced collecting data on wells, groundwater, constructions etc. Pradeshiya lekam has the database.

Disaster management activities are implemented. For example, Wilgoda area generally gets flooded when there is heavy rain since rainwater flows into this area. This area contains

approximately 100 households. Schools are used as temporary shelters. Similarly, during a drought drinking water also needs to be supplied in this area.

Capacity needs:

1. Training on climate adaptation
2. Technology to be used for climate adaptation and mitigation
3. Computer Apps to be designed to provide news on disaster situations quickly.

3.13 Central Environment Authority

Objective: Environment conservation and monitoring

The authority implements environment pollution control programmes, provides Environment Protection License to industries, and establishes Environment Pioneer Programmes with its activities in schools. 'Pilisaru' Solid Waste Management programmes are conducted. Monitor the regulations in relation to environment pollution. Work as a member of the Environment Committee which has been established at the KMC. Conduct green cover improvement programmes in collaboration with the Forest Department. Database exists in the main head office.

Capacity needs:

1. Funding to conduct more awareness programmes
2. Training on climate change adaptation and mitigation
3. Technology needs to establish data bases.

3.14 Central Environment Authority - Wayamba

Provincial environment authority- needs to have air quality measurements etc.

3.15 Provincial Health Services Department-Kurunegala

Objective: Coordination of health services in remote hospitals

There is lack of water for the hospitals. Groundwater is used in hospitals, but its quality is low. Reverse Osmosis (RO) plants are used to supply water to areas affected by the Chronic Kidney Disease of Unknown Etiology (CKDu). But there is no way of checking water quality in the RO water and lack of minerals in the RO as well. The filtered water is sent back to the groundwater (effluent discharge). This will concentrate in the ground soil. Health issues may arise later.

It is necessary to use the well water in hospitals for washing purposes since well water is not suitable for drinking. If possible, send the treated effluent water directly to the hospital for washing purposes.

Most people are not aware of heat effects. Schoolchildren are reported to have Photodermatitis during sport practices.

Capacity needs:

1. Research to study the future effects of consuming RO water.
2. Research of groundwater quality in areas that the effluents of RO water are sent into soil.
3. Research needs to be conducted for climate sensitive non communicable diseases.
4. Hospital staff needs to be trained on climate sensitive diseases.
5. No documentation on climate sensitive diseases
6. Bacteriological examination facilities needed.

3.16 Industrial Services Bureau

Institutional structure: Operates under 4 Divisions (Technical & Environmental Services, Training, Enterprise Development & Training, Project Management & Consultancy, Accounts and Administrative). Head of the organization is Executive Director/CEO who is directly reporting to Board of Management (Chairman: Chief Secretary of North Western Provincial (NWP)).

Legislature: Statutory body under NWP Council, Semi government organization, Self –sustaining and funding, Project based.

Objective: Investment promotion, Regional industrialization, Business training & consultancy, Technical consultancy & laboratory testing facilities (mainly for industries), Project management, Post evaluations & baseline studies of donor funded development projects, Promotion and awareness of sustainable development and Sustainable consumption & production

Core areas where Industrial Services Bureau (ISB) can support in Climate smart city project: Overall project monitoring, laboratory testing services (Air Quality, Heat Stress, Water quality and etc.), climate modelling & analysis, assistance for other institutions, awareness programmes for general public/schoolchildren

Capacity needs:

1. Capacity necessary for climate modelling
2. Laboratory facilities expansion
3. In-house facility for GIS

4. Awareness Programmes

Public awareness: This is a cross cutting issue.

Water scarcity:

The Meteorology Department submits a forecast on increasing temperatures and potential for droughts. The rationing of water and water cuts are discussed with all stakeholders at the District Committee. The KMC issues warnings of water cuts by the use of loudspeaker announcements.

Water Conservation awareness programmes for schools are conducted by the KMC, Central Environmental Authority and Forest Department.

Heat Stress:

With the early warning made by the Meteorology Department, the KMC issues warning by the use of loudspeakers encouraging the residents staying indoors and drinking water. The KMC also provides directives to schools not to conduct sports activities and hold sports meets during the high temperature hours. Laborer shift is changed so that they work in the evening (10.am.-3. pm time periods avoided).

The health officers have noted an increase in cases of Photodermatitis in schoolchildren during the high temperature seasons. Unfortunately, these are not documented.

Other awareness programmes:

The CKDu reduction programmes, Plant distribution, Dengue awareness, Solid waste Management, Waste separation and Water safety plan are other awareness programmes conducted by the government institutions.

5. Discussion and Conclusion

In the discussions, some of the main issues were the necessity for legislation, a lack of staff, need for inter-agency coordination, bureaucratic delays, need for trained personnel, lack of funds to carry out programmes.

Although necessary data is collected in most organizations, there is no comprehensive database that tied up all the separated data from different organizations. The data is scattered throughout Divisions within that organization. It is also of a nature that the data cannot be extracted easily. Some are available as hard copies and some are in annual or monthly totals. Some are for the entire District. The data is not available in Gram Niladhari Division.

GIS expertise is lacking and there is no separate unit for GIS at the Land Use Policy Planning Division (LUPPD). Therefore, it is not possible to map all components in the KMC. Most organizations have no adequate computer facilities or software for GIS.

Most regional offices do not contain their own database. They do not have the expertise or the computer facility to maintain databases either.

There is no networking system, legislature or mandate for data management and sharing.

During the drought season, there is a water scarcity issue. People need to store water in containers due to water cuts. There is a tendency to increase dengue cases during this season. With the onset of rains there is an increase in the number of dengue cases.

Considering the CKDu, it is thought to occur due to increase in agricultural chemical pesticides, heavy metals and fertilizer in water sources. With the drought there is a tendency for chemicals to become concentrated in water bodies leading to the increase in a number of CKDu cases.

As a solution for the provision of potable water, RO plants have been distributed to communities. There is however a concern that the concentrated filtrate is released back to the groundwater. Further, since the RO water does not contain trace elements and minerals, the consumption of such water may lead to health issues in the near future.

The effect of increase in heat has not been identified or documented. There is not much awareness in relation to heat stress despite the fact that it is being experienced. Health authorities have no documentation and no research conducted in this respect.

Tree planting campaigns are implemented without the consultations of relevant authorities. Hence, sometimes these trees obstruct electricity lines or water lines that need to be removed. Sometimes those selected plants are of those that can survive drought conditions.

Due to the size of the Kurunegala city area which is about 12km^2, it is very difficult to prepare models for Urban Heat Island.

The Meteorology Department of Sri Lanka has only 18 Meteorology Stations covering Sri Lanka. There is only one at Kurunegala and very few in the adjacent Districts. Night-time data is not collected. Metrological data is not available free of charge and only processed data is available. It is very expensive to purchase this type of data.

The Climate Change Secretariat has proposed the establishment of Provincial Climate Cells in each Province. The Climate Cell will be chaired by the Chief Secretary and the members of the Cells will consist of the District Secretary, Provincial Ministry Secretary, Deputy Chief Secretary and Provincial Directors covering the subjects of Health, Agriculture, Irrigation, Industry and planning. Since the District Coordinating Committee consists of members of all institutions in a particular district, it would consist of wider stakeholder list. The Climate Cell will address all issues related to climate change of the Province.

6. List of Participants

	Name	Designation	Institute
01	Mr. Sumith Kumara Udawasala	Deputy Mayor	Kurunegala Municipal Council
02	Mr. Pradeep Thillekeratne	Commissioner	Kurunegala Municipal Council
03	Mr. D.P.S. Kumara	Asst. Commissioner	Kurunegala Municipal Council
04	Mr. R.D.J. Thilakarathna	Forest Extension Officer	Range Forest Office
05	Mr. R.A.N.A.Bandara	Municipal Engineer	Kurunegala Municipal Council
06	Ms. I.A.R.Damayanthi	Dpty Director	
07	Ms. B.A.N.Yalegama	Land Use Planning Officer	Land Use Planning Office
08	Ms. D.S.N.Jayamanna	IE	Office of the Director of Irrigation
09	Ms. L.C.M.K.Kulathunga	Chief Engineer	National Water Supply & Drainage Board
10	Mr E.M.I.KEkanayake	Officer in Charge	Water Treatment Plant
11	Ms. A.M.S.P.K.Seneviratne	Asst. DIrector	Central Environment Authority
12	Ms. H.A.Shanthi	Development Officer	Department of Local Government (NWP)
13	Mr. D.M.I.Obesekera	Public Health Inspector	Kurunegala Municipal Council
14	Ms. T.M.Dayawathi	Chief Clerk	Kurunegala Municipal Council
15	Ms. Madusha Jayakody	Consultant	Industrial Services Bureau
16	Dr (Mr) A.M.N.K.Atapattu	MO/PDHS	PDHS Office
17	Mr. D.T.W.Gamini	Senior Engineer	Provincial Director's Office, Road Development Authority
18	Mr. M.D.Chandradasa	Development Officer	Kurunegala Municipal Council
19	Mr. W. Gayan Chathuranga	Health Supervisor	Kurunegala Municipal Council
20	Mr. D.M.S.Jayalath	Meteorological Officer	Meteorological Office
21	Ms. Hasula Wickremasinghe	Programme Assistant	Ministry of Mahaweli Development & Environment
22	Ms. H.M.Menaka Herath	Development Officer	Kurunegala Municipal Council

23	Dr. (Mr) Priyantha	Chief Medical Officer of Health	Kurunegala Municipal Council
24	Mr. D.R.W.W. Kaluarachchi	Municipal Engineer	Kurunegala Municipal Council
25	Mr. D.M.B.T.B.Dissanayake	Engineer (Sewerage)	Greater Kurunegala Sewerage System
26	Mr. Bandula Warnakulasooriya	Disaster Relief Officer	Divisional Secretariat
27	Mr. R.D.D.Rajapaksha	Public Health Inspector	Kurunegala Municipal Council
28	Mr. E.M.P.K.Ekanayake	Programme Officer	Urban Development Authority