THEME 1

WATER SAFETY PLANS

Paper 01
Hazards Identification, Risk Assessment and Analysis in Catchment and Treatment to Implement the Water Safety Plan: A Case Study in Kandy - South Water Treatment Plant

I. D. Ranasinghe[1], S. K. Weragoda[2]
1. Uva Wellassa University, Badulla, Sri Lanka
2. National Water Supply and Drainage Board, Kandy, Sri Lanka

INTRODUCTION

Safe drinking water is a fundamental requirement and internationally accepted human right in human development. According to this paper, research develops an approach for facilitating initial risk identification, assessment and prioritization from catchment to treatment as a principal module in water safety plan which is introduced by World Health Organization.

However several limitations are identified with end-point monitoring in ensuring safe drinking water. Risk identification with assessment and preventive methods are introduced which are leading factors for the development of a water safety plan.

HIGHLIGHTS

- Identifying possible hazards from catchment to treatment
- Identified hazards are analyzed, evaluated, prioritized using semi quantitative matrix
- High risks are controlled urgently
- Moderate and low risks are kept under regular review

METHODOLOGY

Hazards and hazardous events are identified through visual inspection, data collection and previous studies that are evaluated throughout the proposed water supply system. Possible hazards are identified from catchment to treatment using hazardous point maps and analyzing the variation of the water quality parameters throughout the water supply system and in the treatment plant. These identified hazards are evaluated as low, medium and high risks using semi quantitative matrix.

RESULTS

All identified pollution source points in study area (Doluwa, Udapalatha, Gagawata koralaya) are mapped (Figure 1). Pollution source points are mainly categorized as paddy field area, service stations/ garages, hospital waste, slaughter houses/ poultry farms and drainage.

Identified hazards in catchment and treatment are analyzed, evaluated and prioritized (Table 1).

High risks are controlled urgently if sufficient control measures are not taken and moderate and low risks are kept under regular review.

Table 1: Hazard assessment and risk assessment with semi-quantitative approach

Hazardous event (source of hazard)	Risk rating	Priority
Catchment		
Flooding, rapid changes in total solids, dead animals and logs	Medium	Significant
Seasonal variation in water quality	Low	Significant
Nutrients and pesticides from agriculture	Medium	Uncertain
Small scale industry including service stations, slaughter houses, poultry farms	Medium	Uncertain
Potential for informal solid waste disposal and landfill leachates	Medium	Significant
Developments/ Land clearance and Landslide	Low	Uncertain
Treatment		
Disinfection	Low	Uncertain
Power supply	Medium	Significant
Failure in Alum treatment	High	Significant
Changes in Cl concentration	Very High	Significant
Unapproved treatment chemicals and materials, contamination of treatment chemicals	Low	Insignificant
Blocked filters and inadequate filter media depth	Medium	Uncertain
Security / vandalism	Low	Uncertain
Instrumentation failure	Medium	Uncertain
Telemetry	Low	Insignificant
Flooding/ fire / explosion	Low	Insignificant
Operator errors	High	Significant
Manpower shortage	Low	Insignificant
Lack of training	Low	Insignificant

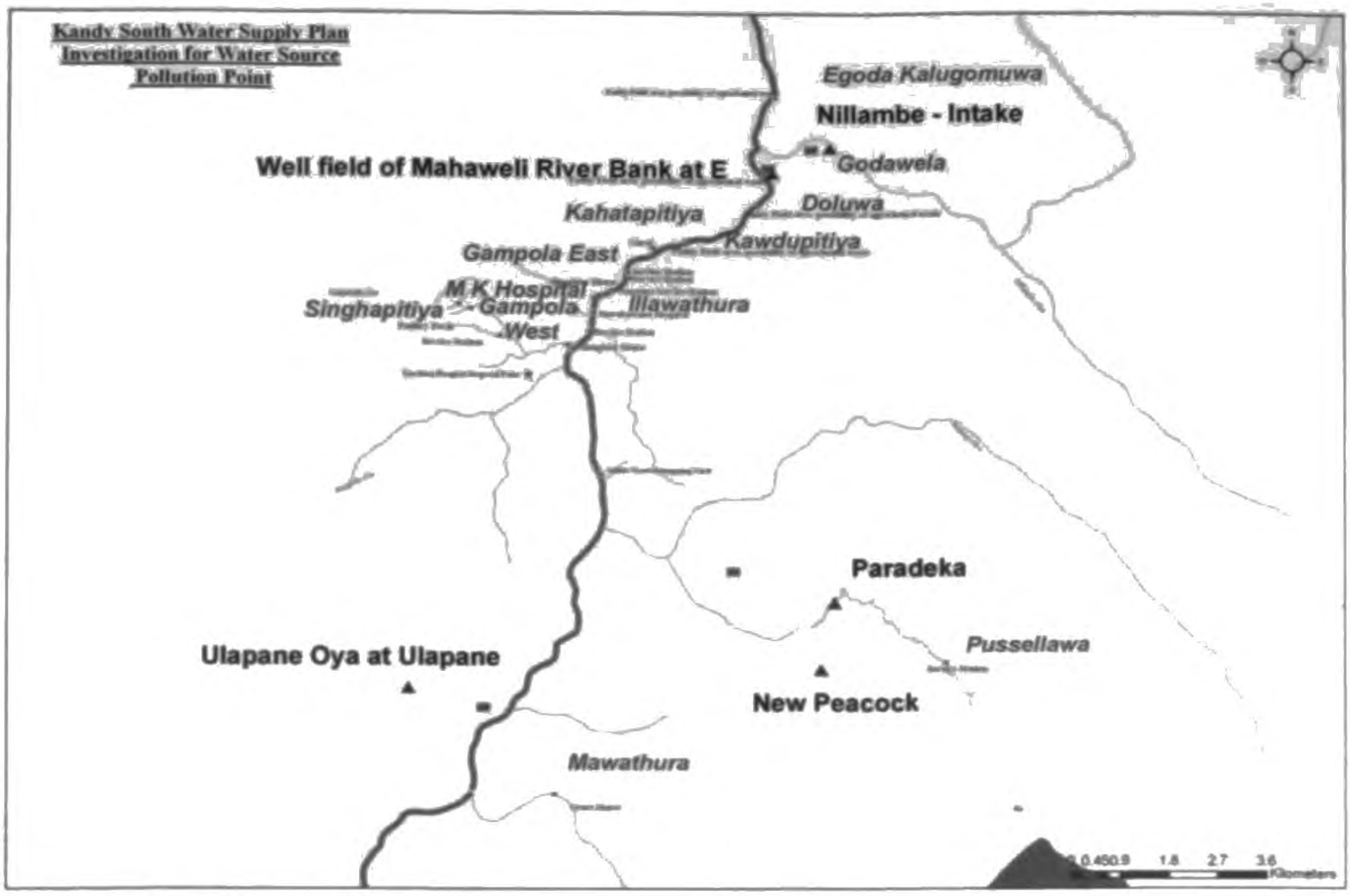

Figure 1: Map of Water source pollution points

CONCLUSION

Conclusion is mainly influenced by available data. Hazardous point maps are more valuable with high availability of data in development of water safety plans. The assessment addressed the importance of severity points where data is limited, prioritization of hazards and impact for the future development of water safety plan.

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