

JCCI International Seminar 2023

Development strategy for citywide inclusive wastewater management in Pokhara, Nepal

As interim results of JICA's Wastewater Management Master Plan Project, being conducted with relevant organizations of Nepal

Presented by Katsumi FUJII
Yachiyo Engineering Co., Ltd.
Leader of Team formed by
Yachiyo Engineering Co., Ltd.
Nihon Suido Consultants Co., Ltd.
NJS Co., Ltd.



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yec 八千代エンジニアリング株式会社

<https://www.yachiyo-eng.co.jp/>

1. Pokhara City
2. Ramsar Convention Registered Wet Land
3. Present System of Wastewater Management
4. Present Condition of Water Quality in City
5. Present Public Awareness
6. City's Development Policy / Plan
7. Master Plan Goal
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9. Development Concept

1. Pokhara City

City Profile

Population 2021
518,452

Area
460km²

Ave. Altitude
827m

Ave. Rainfall
4,000mm

National Profile

Population 2021
29,192,480

Area
14,700km²

GDP per Capita
USD1,191

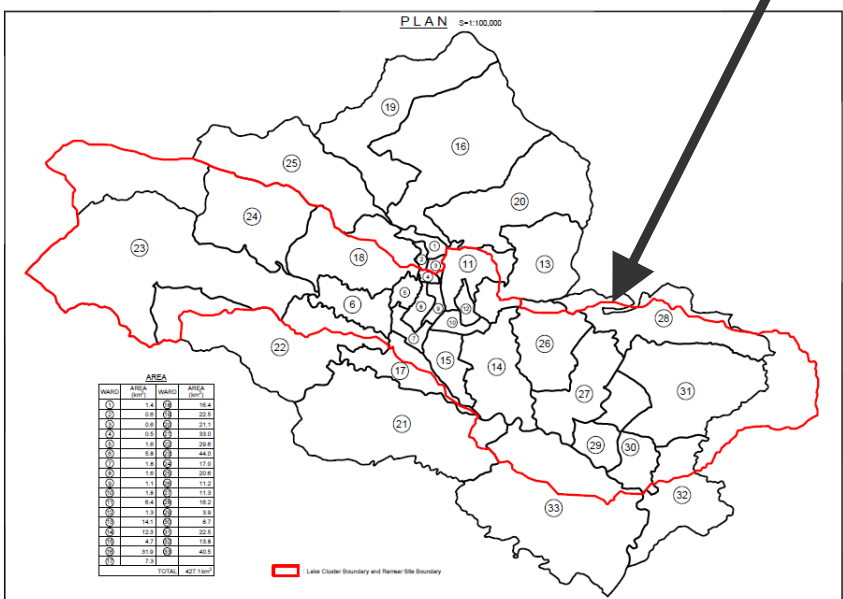
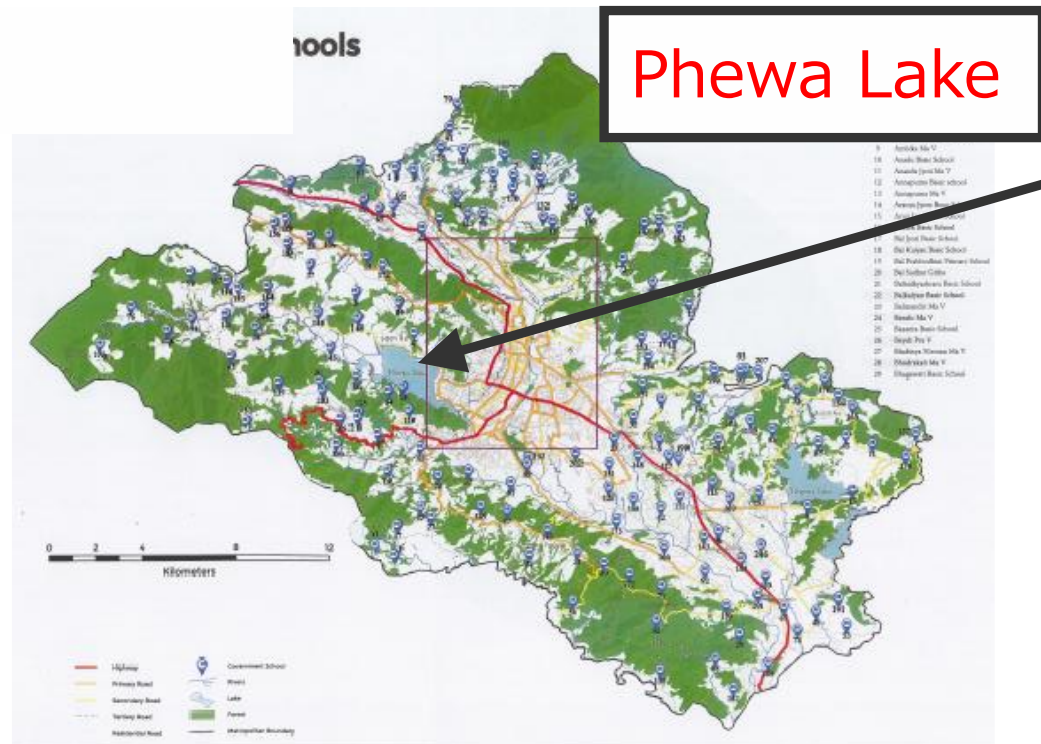


- 2nd large city in Nepal, population basis
- Gate City for Himalayan mountains
- Approx 1 million tourists per year

2. Ramsar Convention Registered Wet Land

Ramsar Convention Registered Wet Land

- Registered in 2016
- 9 lakes/ponds and surrounding area



3. Present System of Wastewater Management

On-site sanitation (No sewerage)



- Permeable Septic Tank (**Soak Pit**)
- On-call septage collection by private sector
⇒ **Little management of Public Sector**
- Sun-dried and landfilled

Piped water supply at approx. 93%



4. Present Condition of Water Quality in City

Sampling Location	Present Condition 2021-2022
Phewa Lake	COD: 1.28~7.84mg/L
Phirke River flowing to Phewa Lake	BOD: 45.5mg/L in dry season DO: 2~3mg/L
City drains flowing to Phewa Lake	BOD: 9.2~58.8mg/L in dry season
Seti River crossing the city	BOD: 1.5~5.2mg/L in dry season
Groundwater	NH4-N: 0.1~0.3mg/L in dry season

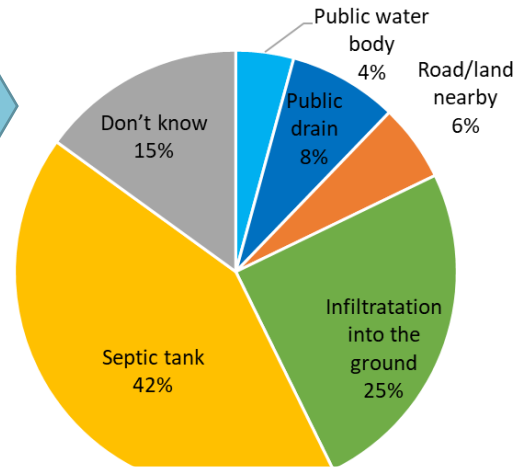
No Significant water pollution
Beginning of deterioration by urbanization and population growth



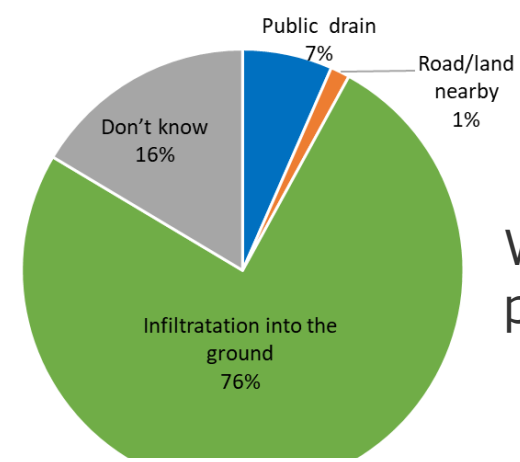
Countermeasures in early stage

5. Present Public Awareness

Drain facility of house

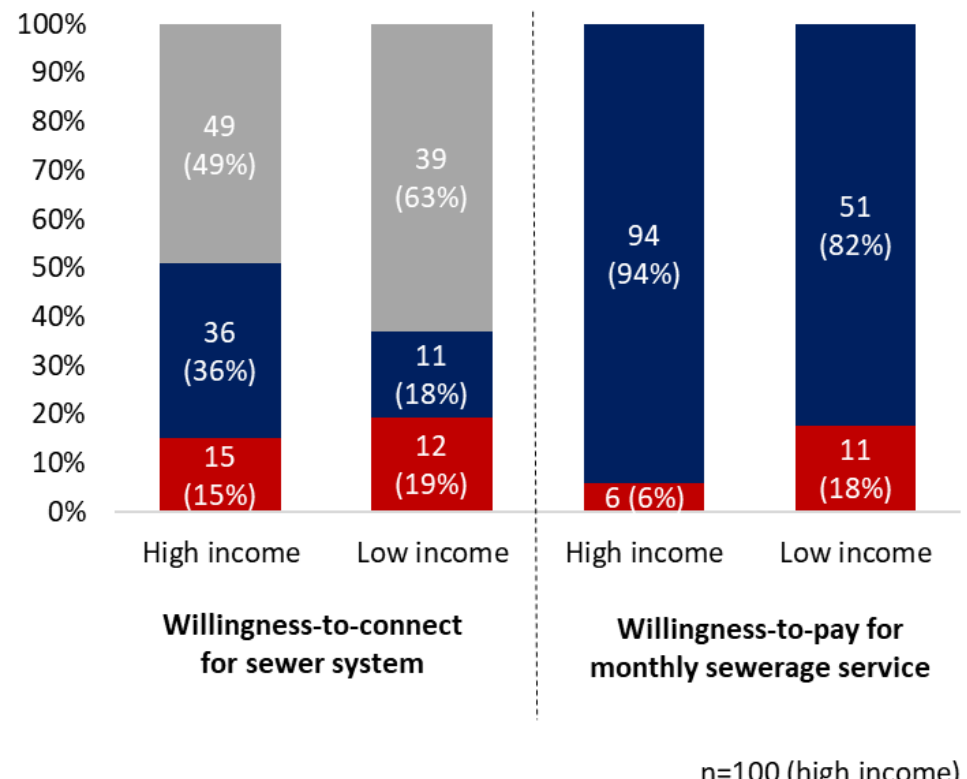
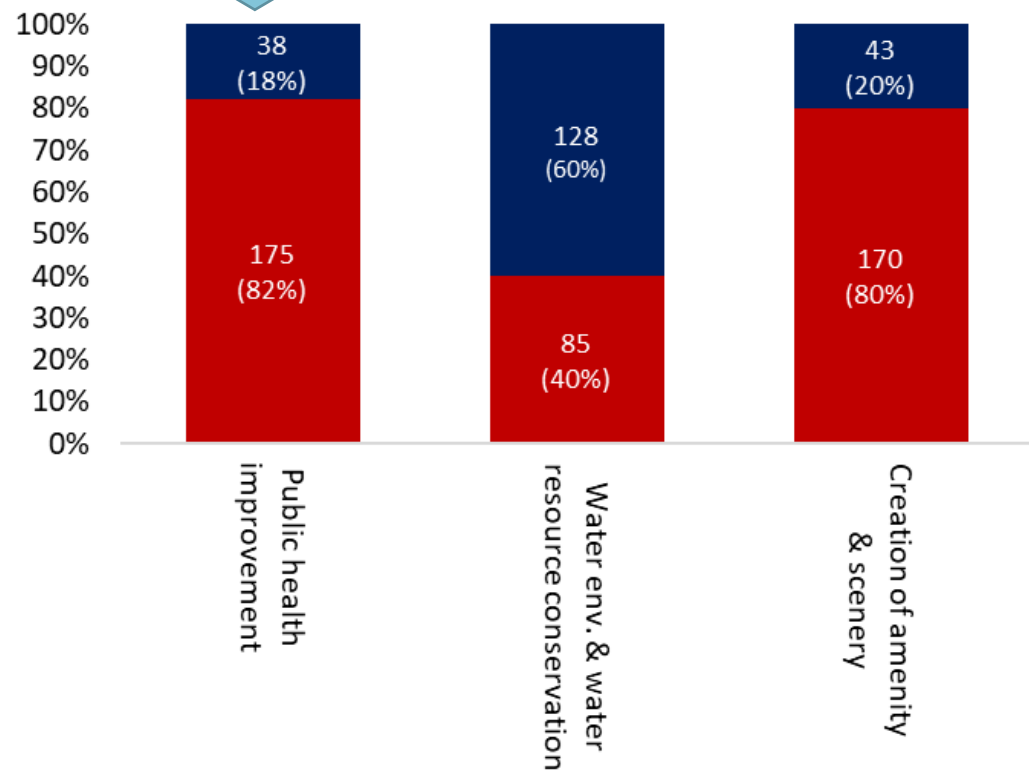


Final destination of wastewater



Purpose of WWM improvement

Willingness to pay



■ Recognized ■ Not recognized

■ Yes ■ No ■ Don't know

6. City's Development Policy / Plan

Long term vision of the City for 2040: Prosperous Touristic Pokhara

- 1) Sustainable and Integrated Development
- 2) Private-Public Partnership
- 3) Human Resources Development & Upgrading Quality of Life
- 4) Fair, Inclusive, Equal Development
- 5) Resilience against Climate Change
- 6) Appropriate Governance
- 7) Data basis Development

Short Term Development Goal of the City by 2024

- 1) Clean Energy Development
- 2) Urban Development considering Environment in Systematic
- 3) Waste Management using new technology
- 4) Productive & Competitive Education resilience
- 5) High Quality Health Service
- 6) Consideration of Gender & Minorities
- 7) Development of Employment and Incomes in Covid-19 management

Quantitative Goal of Pokhara City for **2030** in Sanitation

- Impermeable Septic Tank or Sewerage: 100%
- Sewerage connection in Urban Area: 100%

7. Master Plan Goal

Items	National 2030	Pokhara 2030	Present 2022	This MP	
				2030	2050
Single Households using modern sanitation facilities (%)	95% Safe for drinking water	100% Impermeable septic tank or sewerage	almost 0%	100% in 2030 Safe for drinking water and 100% impermeable for newer buildings constructed / rehabilitated after the MP	100% impermeable on-site sanitation or connecting to sewerage
Urban households with toilets connected to sewerage (%)	90% incl/. Proper On-site sanitation	100%	almost 0%	100% of the first stage sewerage development by 2030 (to be adjusted in figure, according to zoning plan and investment plan)	100% of Sewerage Zone basically covering the urban area
Population using Toilets (%)	98%	100%	81%	100%	100%
Watershed conservation project		2 projects by 2024			To be incorporated

Safe for drinking water

Impermeable septic tank, if shallow wells are used in closing area

Modern Sanitation

Flash toilet and impermeable septic tank, at least

Urban

Other than defined Wards by **"Users Committee Formation, Operation and Management Procedure 2018"** of Pokhara Metropolitan City

Remark

8. Development Strategy (1)

No	Strategy	Main Programs
1	CWIS Approach for whole Pokhara	(1)Sewerage in urban area (2)Improved on-site sanitation in rural area (3)Integrated management for sewerage and on-site systems
2	Sewerage in urban area	(1)Zoning by topographic conditions (rivers, valleys) (2)Priority by population density / characteristics (3)Easy O&M for facilities
3	Impermeable Septic Tank	(1)Introduction for new / rehabilitated buildings (2)Incorporated with building permit system (3)Scheduled de-sludge
4	Treatment of effluent	(1)Wastewater Treatment Plant (WWTP) (2)Feacal Sludge Treatment Plant (STP)
5	O&M system	(1)Ordinances for role / responsibility among PMC and citizens (2)O&M managed by Pokhara Metropolitan City (PMC) (3)Private sector participation
6	Finance	(1) Tariff system for sewerage and on-site systems (2) Financial inputs from Federal Gov. and PMC
7	Water basin monitoring	(1)Scheduled monitoring by PMC (2)Collaboration with FWSSMP in water quality analysis

8. Development Strategy (2)

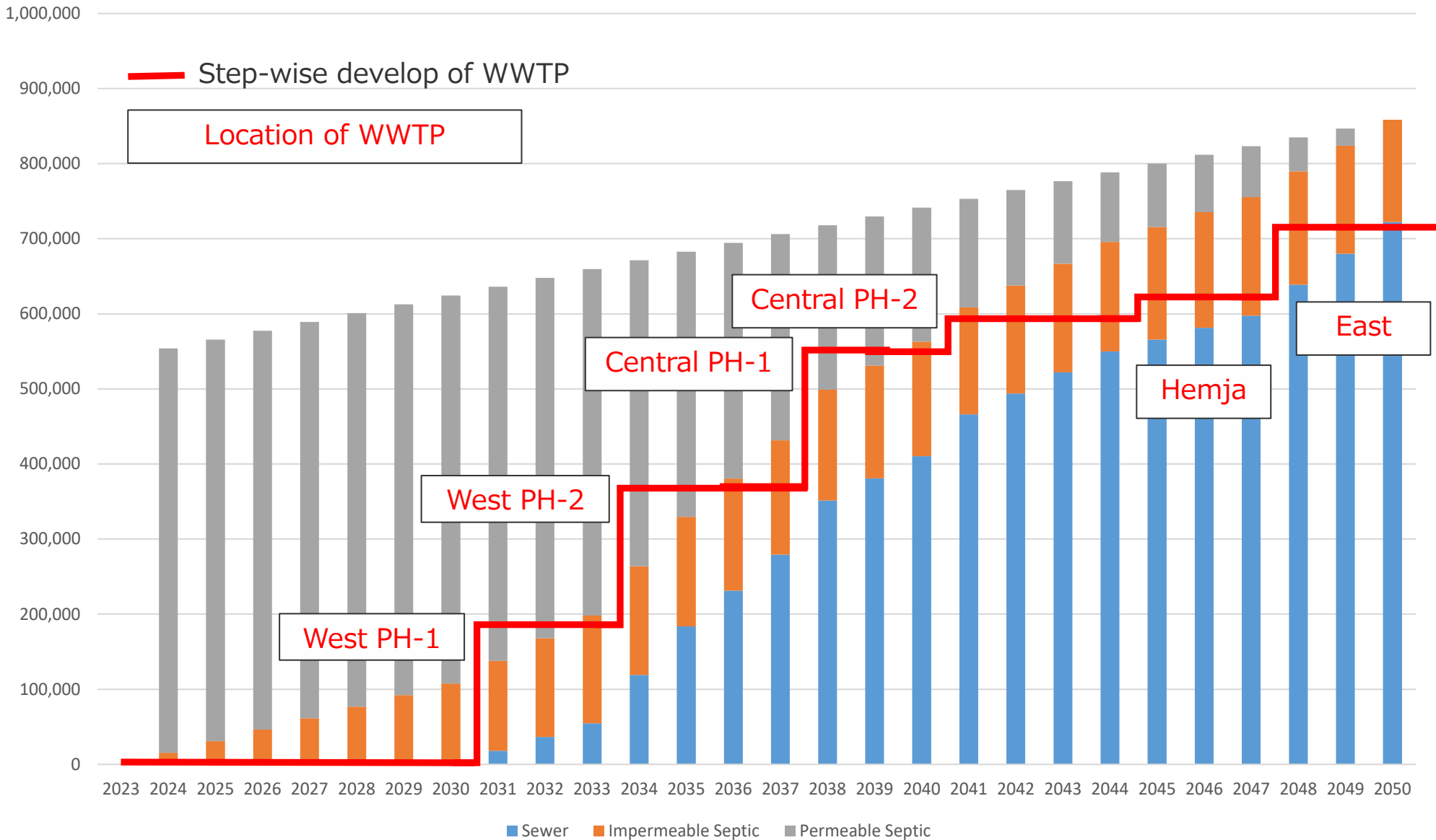
No	Strategy	Main Programs
8	Public relation / Public Awareness	(1) Campaign, Media utilization, Leaflet (2) Utilization of TLO / Community meeting (3) Env. Education (primary school, exhibition, study tour, etc.)
9	Training	(1) Capacity Development Project with Development Partners (2) Private sector utilization through DBO contract, etc. (3) Training of PMC members through the above 2 activities
10	Climate Change, Material Recycling	(1) Energy generation by digestion gas (provision of space for device installation in the future, to keep easiness of O&M) (2) Agricultural utilization of de-watered cake (sludge), space for device installation in the future, to keep easiness of O&M)



Now, Preparing / Discussing
Master Plan

9. Development Concept (Schedule)

Coverage Plan by Sewerage / On-site Sanitation



9. Development Concept (Zoning / Location)

