

 Japan International Cooperation Agency

Federal Flood Commission
Ministry of Water and Power
The Islamic Republic of Pakistan

**The Study on
Comprehensive Flood Mitigation
and Environmental Improvement Plan
of Lai Nullah Basin
in The Islamic Republic of Pakistan**

**Final Report
Volume 3 Supporting Report**



September 2003

 CTI Engineering International Co., Ltd.
 Pacific Consultants International

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PROJECT COST ESTIMATE

Price Level : Average Prevailing Market Prices in 2002
Currency Exchange Rate : US\$ 1 = Rs. 58.0 (Pakistan Rupee) = 120.06 yen

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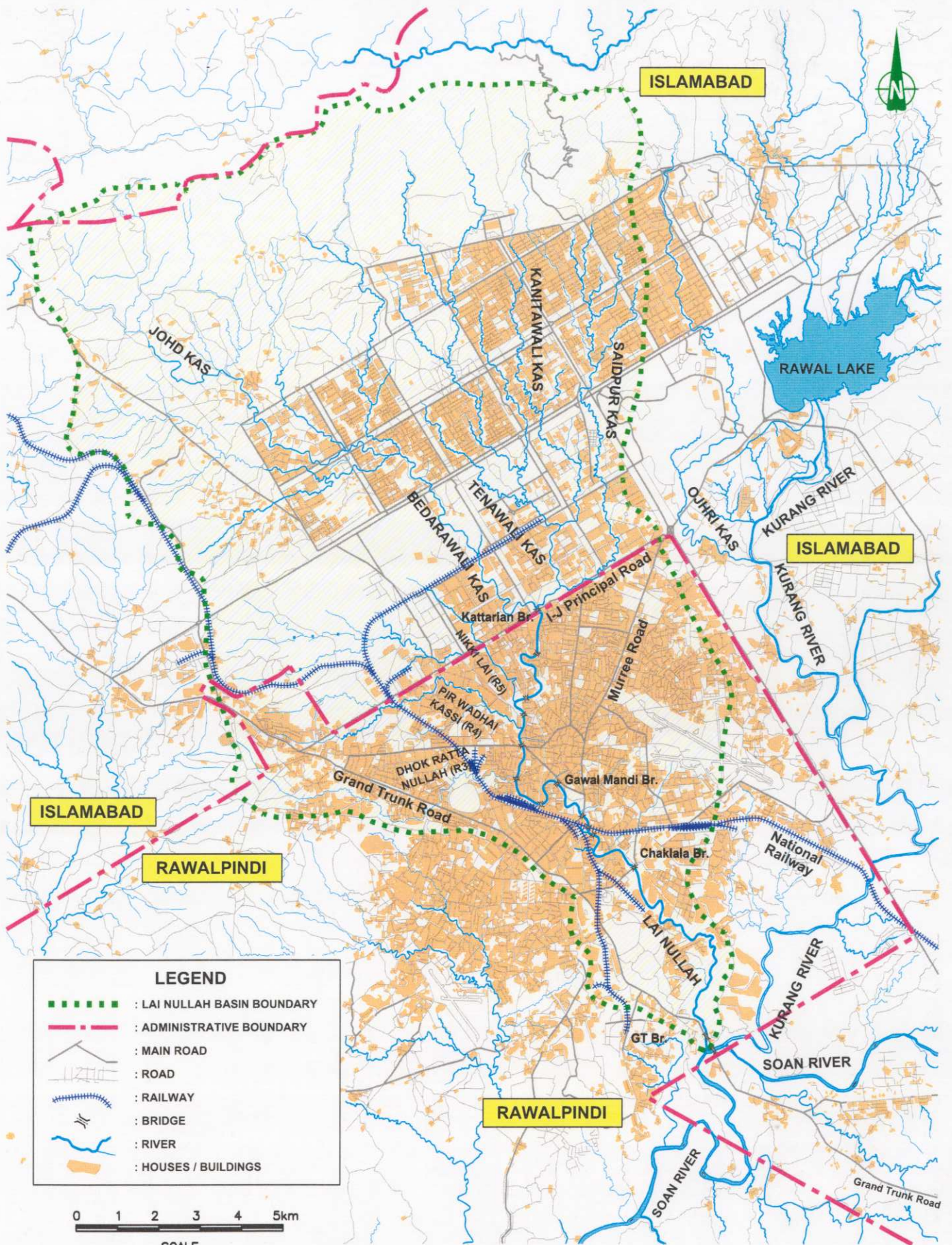
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ABBREVIATION

Organization

ADB	:	Asian Development Bank
AMC	:	Rawalpindi Agromet Center
CDA	:	Capital Development Authority
CIW	:	Commissioner for Indus Waters
DHI	:	Danish Hydraulic Institute
ECNEC	:	Executive Center of National Economic Council
FFC	:	Federal Flood Commission
FFD	:	Flood Forecasting Division
JBIC	:	Japan Bank for International Cooperation
JOCV	:	Japan Overseas Cooperation Volunteer
MES	:	Military Engineering Services
MMP	:	Mott MacDonald Pakistan
MWP	:	Ministry of Water and Power
NFFD	:	National Flood Forecasting Division
OEFC	:	Overseas Economic Cooperation Fund
PCIW	:	Pakistan Commissioner for Indus Waters
PID	:	Punjab Irrigation and Power Development
PMD	:	Pakistan Metrological Department
RCB	:	Rawalpindi Cantonment Board
RDA	:	Rawalpindi Development Authority
RMC	:	Rawalpindi Municipal Corporation
SDO	:	Small Dams Organization, Irrigation and Power Development, Punjab
TMA	:	Tehsil Municipal Administration Rawalpindi
WAPDA	:	Water and Power Development Authority
WASA	:	Rawalpindi Water and Sanitation Authority

Unit

°C	:	Degree Centigrade
cusec	:	Cubic feet per second (1 cusec = 0.0283 m ³ /s, or 1 m ³ /s = 35.3 cusec)
dia.	:	Diameter
g	:	Gram
Ghz	:	Gigahertz
ha	:	Hectare
Kg, kg	:	Kilogram
Km, km	:	Kilometer
L. l. lit.	:	Liter
m	:	Meter
m ³	:	Cubic meter
m ³ /s	:	Cubic meter per second
mil.	:	Million
Mhz	:	Megahertz
MLD	:	Million Liter per Day
MGD	:	Million Gallon per Day (1 MGD = 4.546 MLD)
Rs.	:	Pakistan Rupee
sec	:	second
t, ton	:	Tonnage
US\$:	American Dollar
W	:	Watt

Others

CEA	:	Chief Engineering Advisor
CFFC	:	Chairman, Federal Flood Commission
CN	:	Curve Number
ERC	:	Emergency Cell
EIRR	:	Economic Internal Rate of Return
FFWS	:	Flood Forecasting and Warning System
IEA	:	Initial Environmental Analysis
LAA	:	Land Acquisition Act
PST	:	Pakistan Standard Time
SCS	:	Soil Conservation of Services
SME	:	Small and Medium Enterprise
SWM	:	Solid Waste Management
Sweep	:	Solid Waste Management & Environmental Enhancement Project
UNDP	:	United Nation's Development Programme
UWSSP-R	:	Urban Water Supply and Sanitation Project for Rawalpindi City
WTP	:	Wastewater Treatment Plant