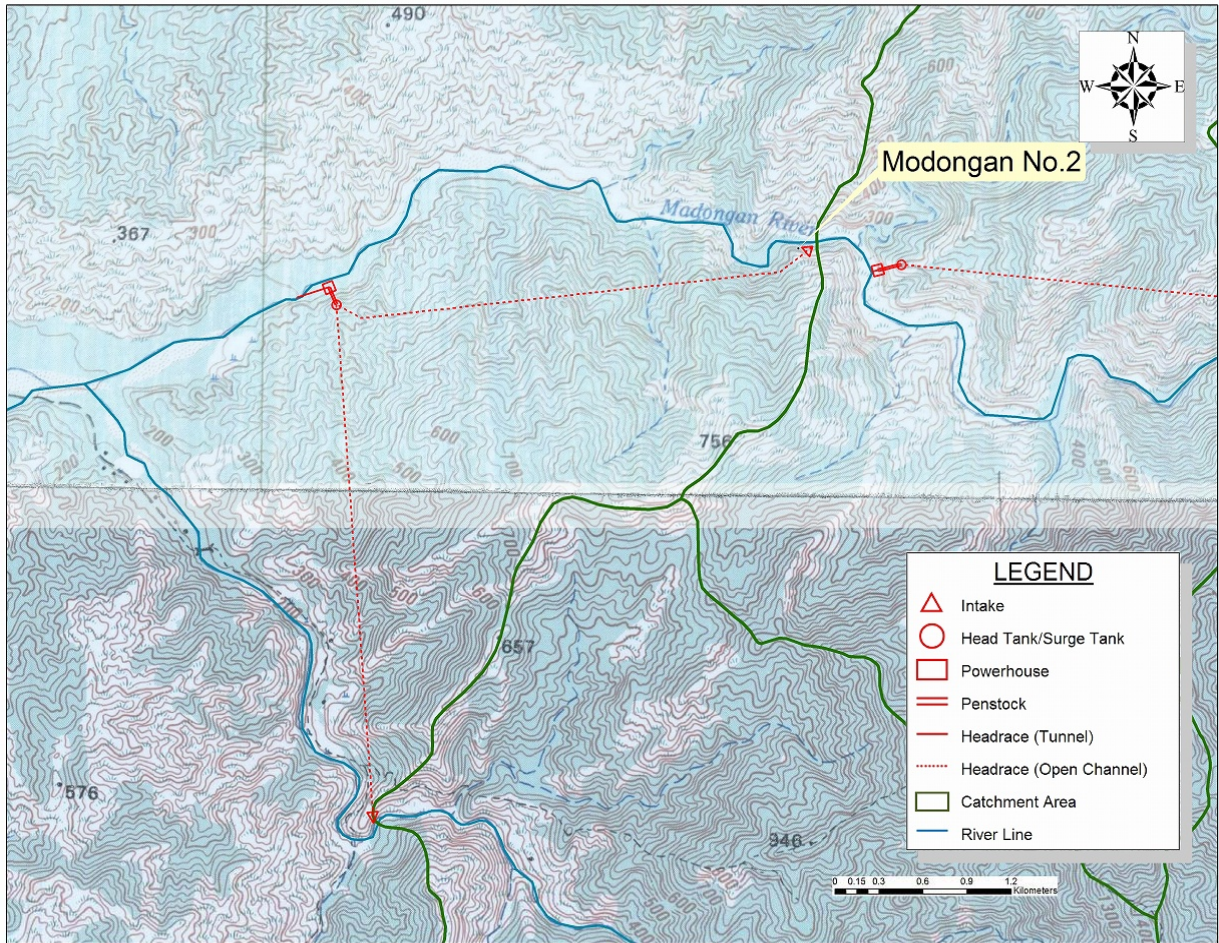


PROJECT NAME **Modongan No.2**



LOCATION

Island	Luzon
Region	ILOCOS REGION
Province	ILOCOS NORTE
Municipality	NUEVA ERA

RIVER

River Basin	Laoag
River	Salsona

RESERVOIR

Reservoir Volume	-	Mil m ³
Effective Volume	-	Mil m ³
High Water Level	-	m

Coordinate

	Latitude	Longitude
Weir/Dam	18°0'48"	120°49'18"
Intake1	17°58'42"	120°47'44"
Intake2	-	-
Powerhouse	18°0'33"	120°47'19"

Remark

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POWER GENERATION PLAN

Max Output	10.40 MW
Power Generation Type	Run of River
Annual Power Generation	33.406 GWh
Plant Factor	35%
Catchment Area	120.83 km ²
Maximum Discharge	13.60 m ³ /s
Gross Head	99.00 m
Effective Head	92.59 m
Intake Water Level	255.00 m
Tailrace Water level	156.00 m

PROJECT EVALUATION

Construction Cost	35.36 Mil USD 1,527.43 Mil PHP
Unit Cost / kW	3,828 USD 165,349 PHP
Unit Cost / kWh	1.09 USD 47.07 PHP
EIRR	6.8%
FIRR	2.4%

*1USD =43.2PHP (03/2012)

CIVIL WORKS

Main Weir	Height	10.0 m
	Crest Length	53.0 m
Headrace	Open Channel	- m
	Tunnel	6,620.0 m
Penstock		190.0 m
Tailrace		230.0 m
Access Road		2.9 km

EM / TL WORKS

Turbine	Type	Francis
	Number of Unit	two unit
Transmission	Line Voltage	- kV
	Length	11.3 km

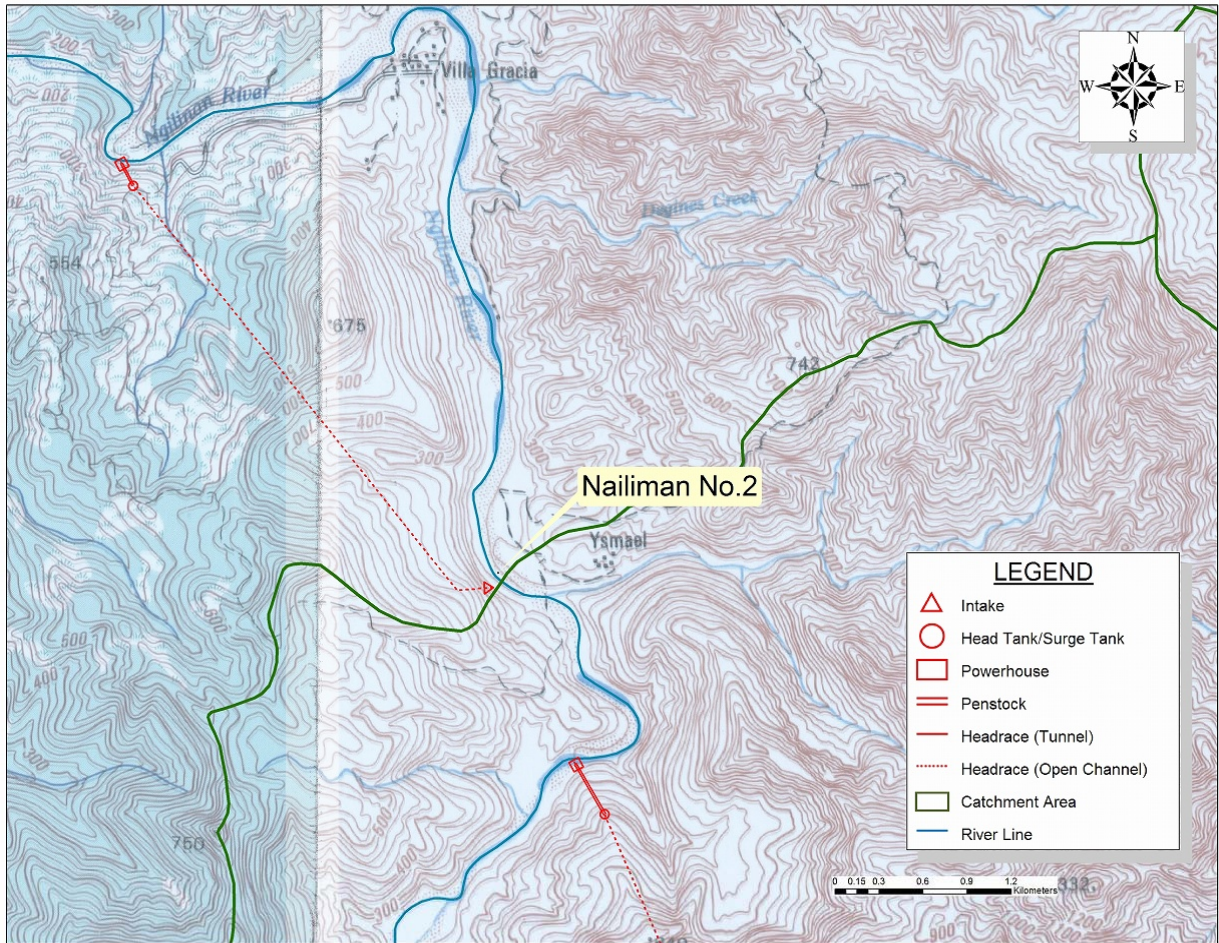
ENVIRONMENT ISSUE

Protected Area	-
Volcano	-

PROJECT STUDY

Study	Type	Map Study Site Reconnaissance
	Date	2012
	Sponsor	JICA

PROJECT NAME Nailiman No.2



LOCATION

Island	Luzon
Region	CAGAYAN VALLEY
Province	QUIRINO
Municipality	MADDELA

RIVER

River Basin	Cagayan
River	Nailiman

RESERVOIR

Reservoir Volume	-	Mil m ³
Effective Volume	-	Mil m ³
High Water Level	-	m

Coordinate

	Latitude	Longitude
Weir/Dam	16°17'13.18"	121°45'46.54"
Intake1	-	-
Intake2	-	-
Powerhouse	16°18'42.87"	121°44'22.57"

Remark

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POWER GENERATION PLAN

Max Output	2.80 MW
Power Generation Type	Run of River
Annual Power Generation	22.335 GWh
Plant Factor	87%
Catchment Area	146.99 km ²
Maximum Discharge	7.72 m ³ /s
Gross Head	54.00 m
Effective Head	44.77 m
Intake Water Level	220.00 m
Tailrace Water level	166.00 m

PROJECT EVALUATION

Construction Cost	28.59 Mil USD 1,234.87 Mil PHP
Unit Cost / kW	7,280 USD 314,496 PHP
Unit Cost / kWh	0.84 USD 36.10 PHP
EIRR	8.9%
FIRR	5.7%

*1USD =43.2PHP (03/2012)

CIVIL WORKS

Main Weir	Height	5.0 m
	Crest Length	102.0 m
Headrace	Open Channel	- m
	Tunnel	3,200.0 m
Penstock		160.0 m
Tailrace		10.0 m
Access Road		2.0 km

EM / TL WORKS

Turbine	Type	Francis
	Number of Unit	one unit
Transmission	Line Voltage	- kV
	Length	26.2 km

ENVIRONMENT ISSUE

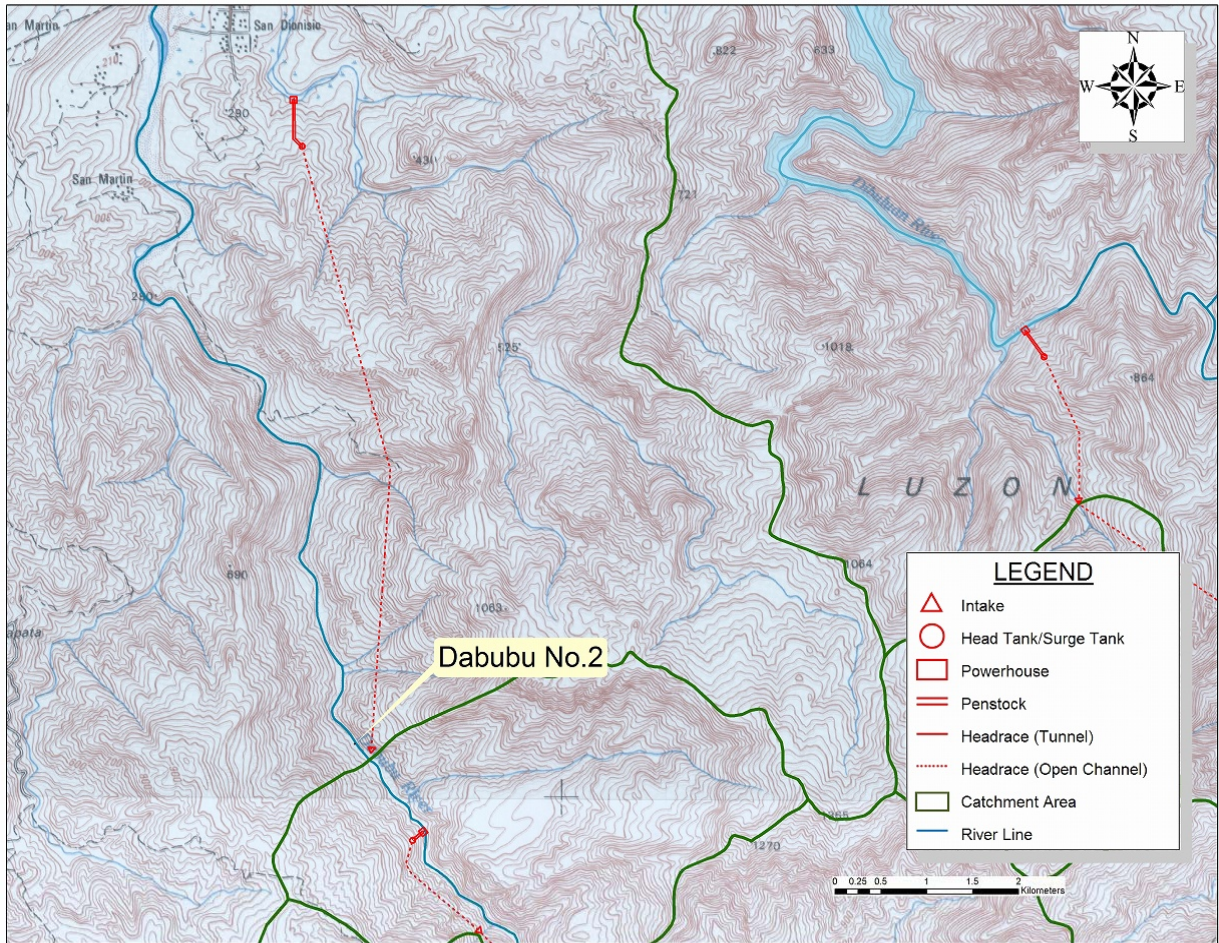
Protected Area	Quirino Protected Landscape
Volcano	-

PROJECT STUDY

Study	Type	Map Study Site Reconnaissance
	Date	2012
	Sponsor	JICA

JICA POTENTIAL SITE WITH SITE RECONNAISSANCE (38 / 47)

PROJECT NAME Dabubu No.2



LOCATION

Island	Luzon
Region	CAGAYAN VALLEY
Province	QUIRINO
Municipality	MADDELA

RIVER

River Basin	Cagayan
River	Dabubu

RESERVOIR

Reservoir Volume	-	Mil m ³
Effective Volume	-	Mil m ³
High Water Level	-	m

Coordinate

	Latitude	Longitude
Weir/Dam	16°20'11.93"	121°48'49.41"
Intake1	-	-
Intake2	-	-
Powerhouse	16°23'50.27"	121°48'31.63"

Remark

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POWER GENERATION PLAN

Max Output	6.70 MW
Power Generation Type	Run of River
Annual Power Generation	39.282 GWh
Plant Factor	64%
Catchment Area	74.12 km ²
Maximum Discharge	7.06 m ³ /s
Gross Head	130.00 m
Effective Head	115.73 m
Intake Water Level	305.00 m
Tailrace Water level	175.00 m

PROJECT EVALUATION

Construction Cost	35.24 Mil USD 1,522.38 Mil PHP
Unit Cost / kW	5,139 USD 222,001 PHP
Unit Cost / kWh	0.80 USD 34.54 PHP
EIRR	10.2%
FIRR	6.6%

*1USD =43.2PHP (03/2012)

CIVIL WORKS

Main Weir	Height	5.0 m
	Crest Length	40.0 m
Headrace	Open Channel	- m
	Tunnel	6,590.0 m
Penstock		580.0 m
Tailrace		10.0 m
Access Road		0.6 km

EM / TL WORKS

Turbine	Type	Francis
	Number of Unit	one unit
Transmission	Line Voltage	- kV
	Length	28.4 km

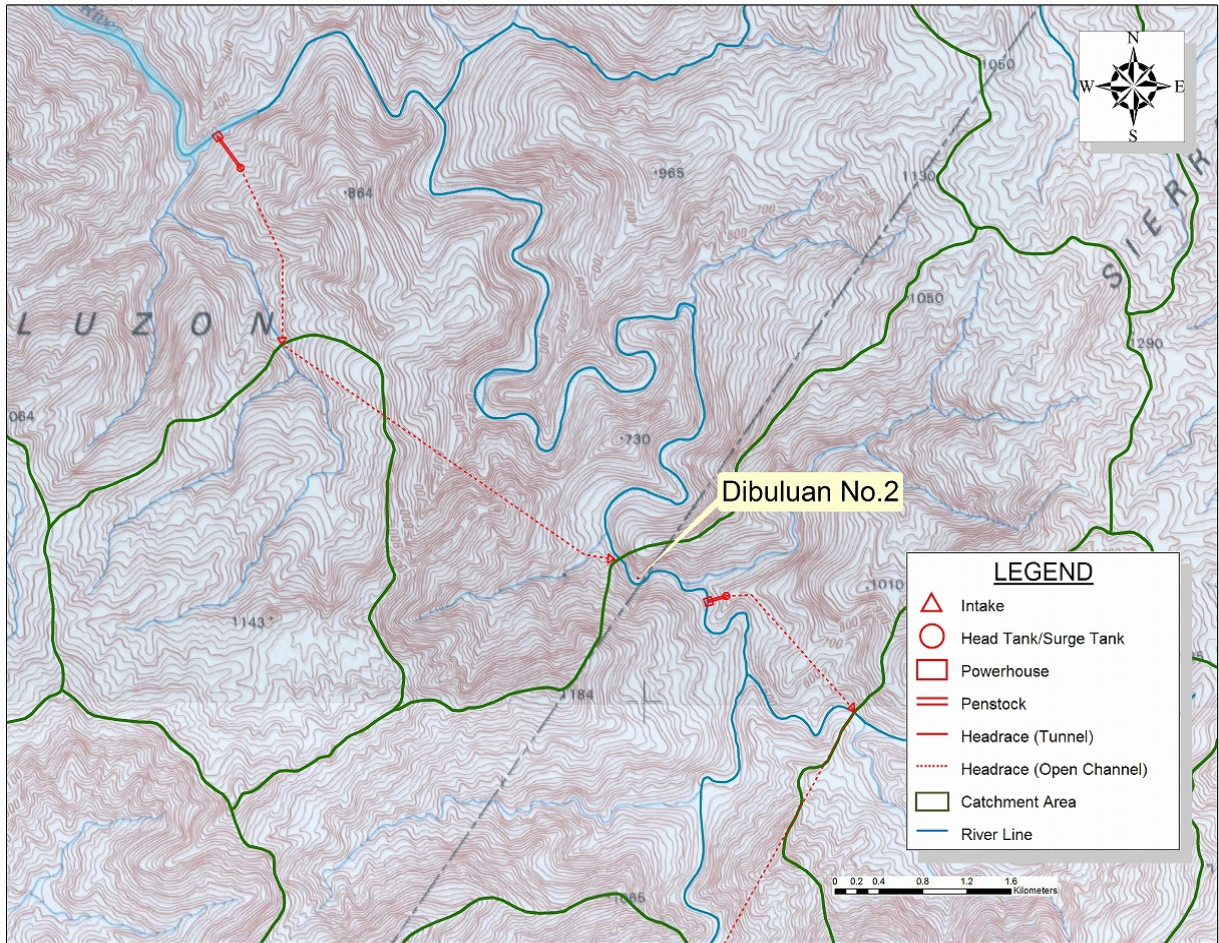
ENVIRONMENT ISSUE

Protected Area	Quirino Protected Landscape
Volcano	-

PROJECT STUDY

Study	Type	Map Study Site Reconnaissance
	Date	2012
	Sponsor	JICA

PROJECT NAME **Dibulan No.2**



LOCATION

Island	Luzon
Region	CAGAYAN VALLEY
Province	QUIRINO
Municipality	MADDELA

RIVER

River Basin	Cagayan
River	Dibulan

RESERVOIR

Reservoir Volume	-	Mil m ³
Effective Volume	-	Mil m ³
High Water Level	-	m

Coordinate

	Latitude	Longitude
Weir/Dam	16°20'29.71"	121°55'3.44"
Intake1	16°21'36.21"	121°53'15.39"
Intake2	-	-
Powerhouse	16°22'38.17"	121°52'57.52"

Remark

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POWER GENERATION PLAN

Max Output	2.20 MW
Power Generation Type	Run of River
Annual Power Generation	17.748 GWh
Plant Factor	87%
Catchment Area	100.51 km ²
Maximum Discharge	5.36 m ³ /s
Gross Head	60.00 m
Effective Head	51.83 m
Intake Water Level	360.00 m
Tailrace Water level	300.00 m

PROJECT EVALUATION

Construction Cost	26.29 Mil USD 1,135.53 Mil PHP
Unit Cost / kW	10,851 USD 468,764 PHP
Unit Cost / kWh	1.24 USD 53.73 PHP
EIRR	3.4%
FIRR	0.9%

*1USD =43.2PHP (03/2012)

CIVIL WORKS

Main Weir	Height	5.0 m
	Crest Length	30.0 m
Headrace	Open Channel	- m
	Tunnel	5,230.0 m
Penstock		310.0 m
Tailrace		10.0 m
Access Road		9.7 km

EM / TL WORKS

Turbine	Type	Francis
	Number of Unit	one unit
Transmission	Line Voltage	- kV
	Length	36.6 km

ENVIRONMENT ISSUE

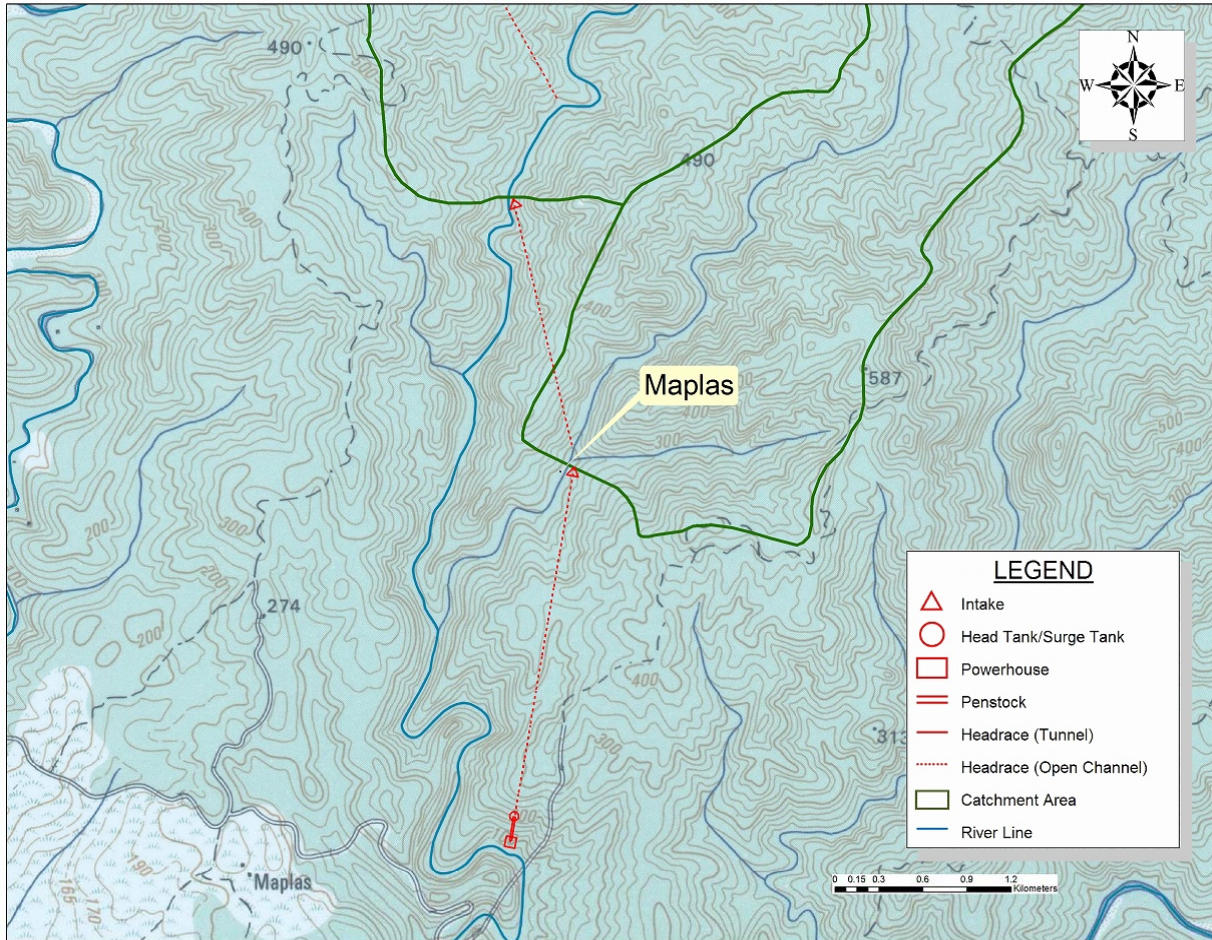
Protected Area	Quirino Protected Landscape
Volcano	-

PROJECT STUDY

Study	Type	Map Study Site Reconnaissance
	Date	2012
	Sponsor	JICA

JICA POTENTIAL SITE WITH SITE RECONNAISSANCE (40 / 47)

PROJECT NAME Maplas



LOCATION

Island	Luzon
Region	CAGAYAN VALLEY
Province	ISABELA
Municipality	ILAGAN (Capital)

RIVER

River Basin	Cagayan
River	Pinacanauan

RESERVOIR

Reservoir Volume	-	Mil m ³
Effective Volume	-	Mil m ³
High Water Level	-	m

Coordinate

	Latitude	Longitude
Weir/Dam	17°7'39.25"	122°4'0.14"
Intake1	17°8'57.07"	122°3'59.23"
Intake2	17°10'27.7"	122°3'6.98"
Powerhouse	17°6'15.84"	122°3'48.4"

Remark

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POWER GENERATION PLAN

Max Output	9.50 MW
Power Generation Type	Run of River
Annual Power Generation	56.438 GWh
Plant Factor	64%
Catchment Area	137.88 km ²
Maximum Discharge	11.27 m ³ /s
Gross Head	112.00 m
Effective Head	102.56 m
Intake Water Level	210.00 m
Tailrace Water level	98.00 m

PROJECT EVALUATION

Construction Cost	61.30 Mil USD 2,648.11 Mil PHP
Unit Cost / kW	4,975 USD 214,899 PHP
Unit Cost / kWh	0.77 USD 33.25 PHP
EIRR	11.0%
FIRR	6.8%

*1USD =43.2PHP (03/2012)

CIVIL WORKS

Main Weir	Height	5.0 m
	Crest Length	12.0 m
Headrace	Open Channel	3,200.0 m
	Tunnel	7,000.0 m
Penstock		190.0 m
Tailrace		10.0 m
Access Road		11.6 km

EM / TL WORKS

Turbine	Type	Francis
	Number of Unit	two unit
Transmission	Line Voltage	- kV
	Length	20.2 km

ENVIRONMENT ISSUE

Protected Area	-
Volcano	-

PROJECT STUDY

Study	Type	Map Study Site Reconnaissance
	Date	2012
	Sponsor	JICA