

Status of Meteorological Network, Observations and Data Management In Lao P D R

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Summary and Purpose of Document

This document aims to report on the meteorological network in Lao PDR and relating operational weather observation tasks. Data archiving and data quality is also discussed. As a matter of fact Laos started operational weather observation since the year 1950 in some large cities and was registered as a member of WMO in 1955. Unfortunately under the least developed country status, there has not been much improvement or development in the field of meteorology during the past decades. The establishment of meteorological stations has been slightly increased and extended in most of large cities in the last 10 years. All instruments are analogue and manual types as a result these furnished all manned stations. These existing deteriorated instruments have no means to get calibration due to lack of standard calibrating tools. This situation lead to poor data quality even though data are preliminary checked manually prior to be archived in forms of hard copies and digital recorded devices.

1. Observation networks

1.1 Surface observations

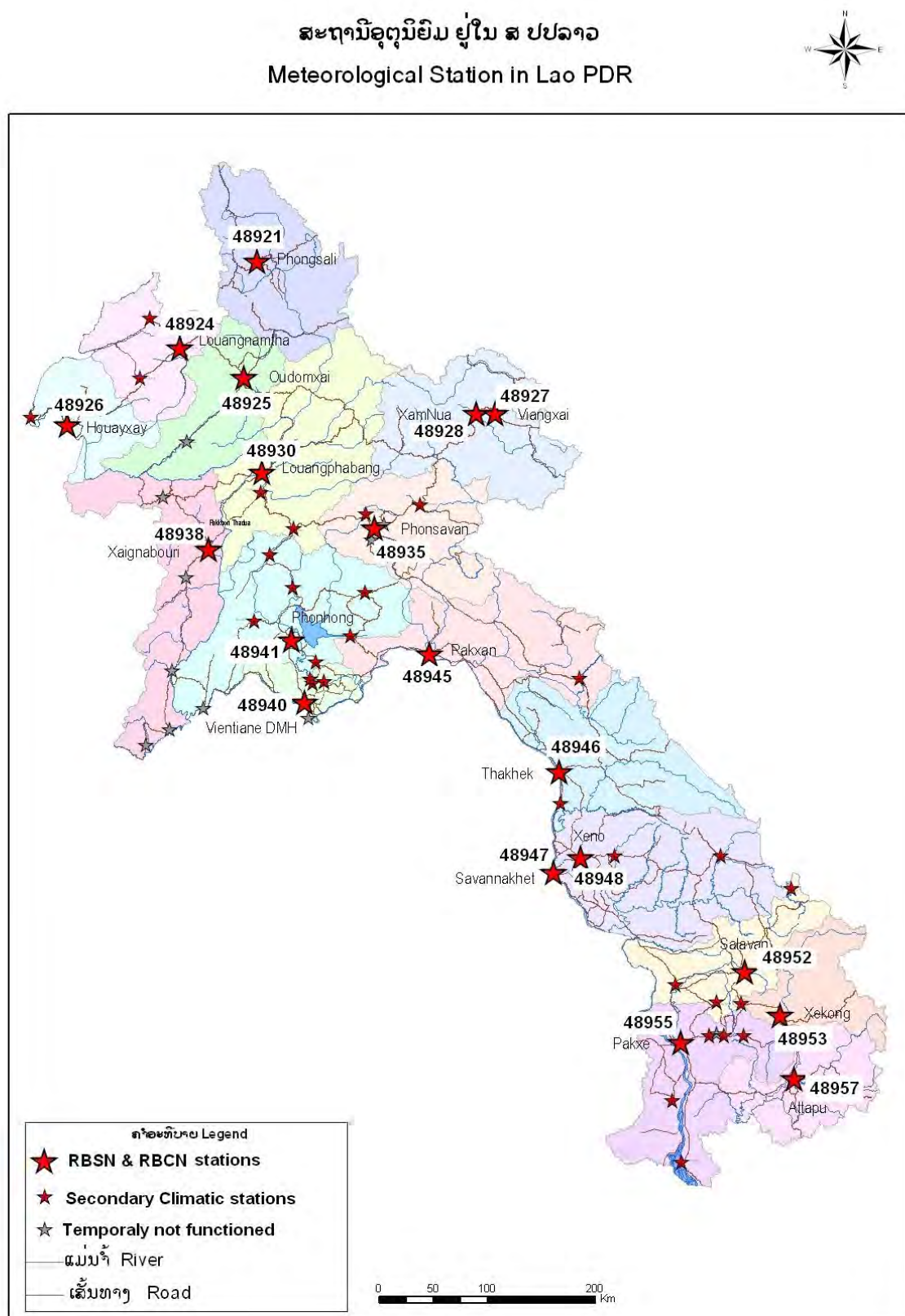
1.1.1 Number of stations: RBSN, RBCN, GSN, manned stations and AWS*

Table 1 Number of stations

	RBSN	RBCN	GSN	Manned stations	AWS *
number	19	4	0		0

Note: There are 29 secondary climatic stations which make a total of 48 stations, including 4 RBCN

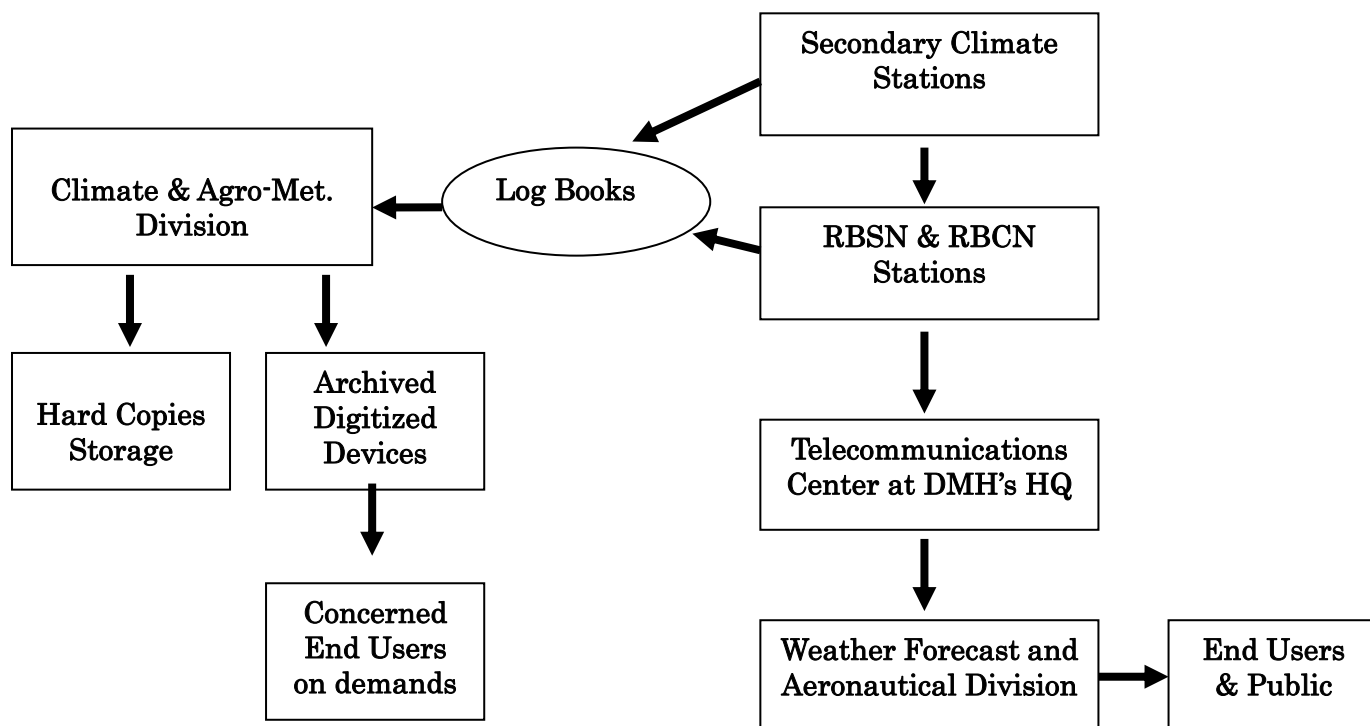
1.1.2 Station map



1.1.3 Time and frequency of observations

- 4 stations carried out 8 times observations namely : 48940 , 48947 , 48930 and 48955 at 00UTC, 03UTC, 06UTC , 09UTC, 12UTC,15UTC,18UTC ,and 21UTC
- Others make 4– 5 observations (day time only): 00UTC, 03UTC,06UTC,09UTC,12UTC

1.1.4 Data flow to users and archives



1.2 Upper-air observations

1.2.1 Number of stations: RBSN, RBCN, GUAN, manned stations and automated system stations

	RBSN	RBCN	GUAN	Manned stations	Automated system stations
number	0	0	0	0	0

1.2.2 Station map

1.2.3 Time and frequency of observations

1.2.4 Data flow to users and archives

Upper-air observation data flow to users and archives is expected to be described with an illustration.

2. Siting and metadata

List of meteorological stations : The highlighted blue stations are RBSN & RBCN

No.	WMO ID	Station name	District	Village	Latitude N	Longitude E	Altitude
1	48940	Vientiane DMH	Sikhottabong	Akat	17° 57'	102° 34'	171
2	48944	Thangone	Xaithani	Thangone	18° 17'	102° 38'	185
3		Veunkham	Xaithani	Chaleunsay	18° 11'	102° 37'	178
4	48942	Naphok	Xaithani	NAFRI	18° 09'	102° 44'	170
5	48921	Phongsali	Phongsali	Phongsali	21° 42'	102° 05'	1300
6	48924	Louangnamtha	LouangNamtha	LouangNamtha	21° 03'	101° 28'	557
7	48922	Meuang Sing	Sing	Siliheuang	21° 11'	101° 09'	643
8	48923	Viangphoukha	Viangphoukha	Phouka	20° 41'	101° 04'	671
9	48925	Oudomxai	Xai	Phoulay	20° 41'	102° 00'	648
10	48926	Houayxay	Houayxay	Airport	20° 16'	100° 24'	401
11	48929	Thonpheung	Thonpheung	Khoneuang	20° 19'	100° 09'	371
12	48930	Louangphabang	Louangphabang		19° 53'	102° 08'	560
13		XiangNgeum	Xiang-Ngeun	HouaiKhoat	19° 45'	102° 10'	304
14	48931	Phoukhoun	Phoukhoun	Phoukhoun	19° 26'	102° 26'	1317
15	48928	XamNua	Xam-Nua		20° 25'	104° 04'	1000
16	48927	Viangxai	Viangxai	Phonbeng	20° 25'	104° 14'	913
17	48938	Xaignabouri	Xaignabouli	Xaignabouri	19° 14'	101° 44'	292
18	48935	Phonsavan	Pek	Thonghaihin	19° 28'	103° 08'	1094
19	48936	Meuang Kham	Kham	Longpeeo	19° 39'	103° 34'	587
20	48932	Meuang Phoukout	Phoukout		19° 34'	103° 05'	1114
21	48941	Phonhong	Phonhong	Nalongkhoun	18° 28'	102° 24'	179
22	48943	Napheng	Thoulakhom	Thourakhom	18° 16'	102° 56'	172
23		Kasi	Kasi	Kasikhammueang	19° 24'	102° 29'	360
24	48939	Vangviang	Vangviang	Vangviang	18° 55'	102° 27'	298
25		Meuang Fuang	Fuang	Fuang	18° 39'	102° 26'	243
26	48934	Longxan	Hom	PhonhNgam	18° 32'	102° 57'	254
27	48933	Xaisomboun	Xaisomboun	Namcha	18° 59'	102° 56'	460
28	48945	Pakxan	Pakxan		18° 24'	103° 40'	155
29	48950	Lak 20	Khamkeut	Somsanouk	18° 11'	104° 51'	540
30	48946	Thakhek	Thakhek	Chompheth	17° 23'	104° 49'	151
31		Nongbok	Nongbok	Song Muang Tai	17° 09'	104° 49'	147
32	48947	Savannakhet	Kaysone Phonmvihane	Xai Oudom	16° 33'	104° 45'	144
33	48948	Xeno	Outhoumphon	Outhomphon	16° 40'	105° 00'	185
34		Donghen	Atsaphangthong	Donghen	16° 42'	105° 16'	158
35	48949	Xepon	Xepon	Xepon	16° 43'	106° 12'	170
36	48952	Salavan	Salavan	Laksong	15° 41'	106° 26'	168
37	48951	Khongxedon	Khongxedon	Khong	15° 36'	105° 48'	156
38		Laongam	Lao-Ngam	Laoneam	15° 28'	106° 10'	540
39		Samouay	Samouay	Samouay	16° 25'	106° 49'	400
40	48953	Xekong	Lamam	Phiamai	15° 20'	106° 41'	143
41	48954	Thateng	Thateng	Thateng	15° 27'	106° 22'	816
42	48955	Pakxe	Pakxe	Pakxe	15° 07'	105° 47'	104
43	48956	Pakxong	Pakxong	Pakxong	15° 14'	106° 20'	1200
44		Nikhom 34	Pakxong	Houei Vai	15° 10'	106° 24'	1120
45		Itou	Pakxong	Itou Lak35	15° 10'	106° 35'	890
46	48958	Soukhouma	Soukhouma	Soukhouma	14° 39'	105° 47'	90
47	48959	Meuang Khong	Khong		14° 07'	105° 50'	76
48	48957	Attapu	Samakkhixai		14° 48'	106° 50'	103

Metadata = Most of parameters are daily mean, monthly and yearly mean, extreme Absolute (Max, Min) , Average, Normal

3. Instruments, sensors, upgrade, maintenance, instrument intercomparisons and traceability

All existing instruments are analogue system. All stations are manned stations. Installation, checking of status and maintenance by DMH HQ's staff. No calibration nor intercomparisons were conducted. Recent improvement of six synoptic stations by JICA TCP.

4. Quality assurance / quality control (real-time, non-real time)

1). Quality Assurance : DMH does not have QA system (mechanism). Data are manually keyed into message switching PC, then send in to GTS RTH Bangkok. Simply the operators are taking care of possible errors or mistakes.

2). Quality Control : This is primary manually checked for possible man made mistakes basing on staff experiences , then staff key in to CLICOM software format. For hydrological data , the HYMOS software is used

5. Training

DMH conducted its in-house Training Course on surface observation, but only technician operational Observer level. The trainees have to completed High School or year 12. This is not a regular training to be opened every year, but depending on needs of new staff and availability of fundings.

6. Statistics and applications

Statistics .are utilized for climate analysis, to serve for agricultural purposes, disaster risk analysis, as well as for requested projects

7. Current issues and future plan

DMH has set up its implementation plan for data management improvement firstly by the TCP , support by JICA experts for technology transfer and the WMO-World Bank-UNISDR Project to support Southeast Asia member countries. Secondly under the capacity building framework alongside with the implementation of Mekong-Integrated Water Resources Management Programme (M-IWRMP). Within the strategic plan 2011 – 2015, DMH has to take part in providing data over projected basins with data quality assured and controlled. This will be achieved by technical Assistance of International Experts and financial support by potential donors including Japan. Thirdly DMH will participate the activities of MRCS, especially the capacity building on Hydro-Met Data Quality assurance and Quality Control under the Information and Knowledge Management Programme (IKMP) and the HYCOS project.