

# MYANMAR

## Abstract

This report describes the activities for the protection of ozone layer and the future plan for ozone monitoring as a part of the global ozone monitoring network. The author also tries to get the correlation of the skin cancer and eye disease of cataract with the ozone depletion.

## 1. Introduction

Ozone layer absorbs much of the biologically damaging ultraviolet radiation emitted by the sun. As a consequence, the world ecosystems have evolved over hundreds of years in ultraviolet conditions controlled by this layer of ozone.

The total amount of ozone at any hemisphere of the earth varies daily but is generally lowest over equatorial region and highest at mid-northern latitudes, such as the area around Hudson's Bay and eastern Siberia. A significant decline was observed over both polar region, especially during the cold stratospheric winter/spring periods. There is no statistically significant trend in the equatorial belt (10°N-10°S) and between 10° and 35°N (WMO,1998). Figure (1) shows the percentage depletion in total atmospheric ozone between 1979 and 1997 from 60°N to 60°S. Figure (2) shows the overall ozone decline. The annual cycle of global ozone for two periods (1964-1980 and 1984-1997) are plotted in figure(3).

The exhaust gases from a fleet of supersonic aircraft flying in the lower stratosphere could adversely impact stratospheric ozone and a class of inert chemical known as chlorofluorocarbons (CFCs) used in refrigerators, air conditioning systems and aerosols, transported to the atmosphere by convective air currents, released free chlorine under the action of sunlight could destroy ozone. Measurement and special stratospheric campaigns during 1986 and 1987 confirmed that CFCs were playing a major role in ozone destruction.

Additional scientific evidence emerged on just how destructive both chlorine and bromine could be to stratospheric ozone, and this was confirmed by observations from WMO ozone network.

## 2. Geographical Feature of the Union of Myanmar

Myanmar is situated between latitude 9° 58' N to the south, and 28° 31' N to the north, 92° 10' E to the west and 101° 11' E to the east.

Myanmar has the largest area among the nations of the southeast Asian peninsula with an area of about 680,000 square kilometers. It is sharing common borders with China in the north and northeast, with Laos in the east, with Thailand in the southeast, and India and Bangladesh in the west. Myanmar has a population of about 50 million.

## 3. Radiation and Ozone Measuring Instrument

In 1992 the USSR had sent six sets of ozone measuring instrument and one thousand ozone sounding balloons to Myanmar under the WMO/VCP project of OB/7/1/1. Although Myanmar received those black and white coloured balloons, very unfortunately all six sets of radiation and ozone measuring instrument were supposedly lost at one of the Asian seaport on 1 January, 1992 and Myanmar lost the opportunity for monitoring the vertical profile of ozone and for better understanding of global atmosphere. Since that time Myanmar has planned to monitor the ozone layer at different locations throughout the country.

#### **4. Activities for Protection of the Ozone Layer**

Myanmar has signed many important International Agreements and Conventions including the Vienna Convention and the Montreal Protocol of Protection of the Ozone Layer.

Another activity is the formulation of a country program to phase out Ozone Depleting Substance (ODS). The formulation of the country program was initiated in 1997 with UNDP assistance. It is being carried out by the National Commission for Environmental Affairs acting as lead agency and supported by a country program work team formed within the Agency. An intensive survey was conducted by the work team at the government departments, private entrepreneurs, workshops and individuals who are connected with the use of Ozone Depleting Substance.

The following points are presented to provide an overview of the ODS situation in Myanmar.

- In Myanmar, the main ODS consuming sector is the refrigeration and the air conditioning systems.
- CFC 12 is the largest consumed controlled substance in Myanmar and its consumption is steadily increasing from 1994 to 1996.
- Consumption of CFC 11 started in 1996 and is consumed in central air conditioning equipment and cold storage facilities installed during the year.
- No ODSs are produced in the country.
- The scientists and researchers are aware of ozone depletion, interconnection of ozone depletion and climate change. They also report these information and preventive measures to the policy makers.
- The educational public awareness dissemination concerning ozone depletion, causes and the dangerous threat of stratospheric ozone depletion for climate and society and reduction of ozone depletion are being carried out by using different kinds of media.

#### **5. Patients of skin cancer and eye disease**

There are three hospitals established especially for cancer treatment. These are Yangon general hospital, Mandalay general hospital and Tounggyi Sao San Htun hospital.

Only the number of patients suffering from skin cancer and eye disease who took treatment at the general hospitals (at Yangon and Mandalay) and eye, ear, nose and throat hospitals (at Yangon and Mandalay) are collected. Among those diseases the possible disease of cancer due to ozone depletion and the number of those patients are sorted as shown in Tables 1 and 2.

The commonest cancer at Yangon General Hospital from the year 1993 to 1999 are shown in tables 3, 4, 5. The number of patients of eye disease "cataract" which is caused by the ozone depletion is sorted out from collected eye diseases and it is shown in table 6. Actually these data do not represent the country's total because the number of patients who have taken medical treatment at private and cooperative clinics and hospitals, indigenous hospitals and indigenous medicine practitioners are not included.

#### **6. Future Plan for Monitoring Ozone layer**

The global average of ozone distribution and the locations of the WMO ground-base ozone network are shown in Figure 4. This figure shows that the ozone measuring stations are less and inadequate in the tropical region. If WMO provides the ozone measuring instruments to install Myanmar, which lies in the tropics, and the northern Myanmar situates at the boundary of sub-tropics, it will fulfill the requirement of more measuring ozone stations in the tropics. Myanmar has arranged proposed locations for installation of ozone measuring instruments at existing six different meteorological stations throughout the country when the opportunity for receiving ozone measuring instruments comes. These proposed locations are shown in figure 5.

## 7. Concluding Remark

Although the number of patients suffering from skin cancer and eye disease are increasing in the year 2001 compared with those of the earlier years the correlation between the number of those patients and ozone depletion is not significant.

This may be due to the following reasons:

1. Myanmar lies in the tropics in which no downward trend in ozone has been observed in equatorial belt (10°N-10°S) and between 10° and 35°N.
  2. The number of patients of skin cancer and eye disease collected here does not represent the country's total number of patients.
- Monitoring of ozone layer and the expanded activities to protect the ozone layer are inevitable task in Myanmar.

## Acknowledgement

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## References

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Oncology Department  
Mandalay General Hospital

Serial No.	Year	Disease		
		Skin	Malignment Malaenoma	Basal Cell Carcinoma
1	1964	13	-	-
2	1965	23	-	-
3	1966	18	-	-
4	1967	15	-	-
5	1968	23	-	-
6	1969	21	1	-
7	1970	23	-	-
8	1971	25	1	-
9	1972	21	-	-
10	1973	20	1	-
11	1974	21	-	-
12	1975	15	-	-
13	1976	9	-	-
14	1977	11	-	-
15	1978	7	-	-
16	1996	9	5	-
17	1997	11	5	-
18	1998	24	4	2
19	1999	23	6	-
20	2000	22	2	15
21	2001	*	*	*

\* Data not including.

Table (1). Number of cancer patient at Mandalay General Hospital.

Radiotherapy Department  
Yangon General Hospital

Serial No.	Year	Disease			
		Skin	Malignment Malaenoma	Basal Cell Carcinoma	
1	2000	2	1	10	2
2	2001	12	5	2	4
3	2002 (up to 15-2-2002)	4	1	2	1

Table (2). Number of cancer patient at Yangon General Hospital.

Table 3. TEN **COMMONEST** CANCERS FOR ALL PATIENTS (1993-99)

<b>NO. OF CASES</b>					
<b>ICD</b>	<b>TYPE OF CANCER</b>	<b>MALE</b>	<b>FEMALE</b>	<b>TOTAL</b>	<b>PERCENT</b>
180	CA CERVIX	0	2947	2947	16.99%
174	CA BREAST	0	2787	2787	16.07%
162	CA LUNG	1712	897	2609	15.04%
161	CA LARYNX	758	223	981	5.66%
150	CA OESOPHAGUS	453	205	658	3~9%
202	NHL	350	257	607	3.50%
147	CAPNS	356	155	511	2.95%
151	CA STOMACH	210	167	377	2.17%
173	SKIN OTHER THAN MELANOMA	193	161	354	2.04%
141	CA TONGUE	210	122	332	1.91%
	<b>ALL CANCERS</b>	<b>7159</b>	<b>10187</b>	<b>17346</b>	

Table 4. TEN **COMMONEST** MALE CANCERS (1993-99)

<b>ICD</b>	<b>TYPE OF CANCER</b>	<b>NO. OF CASES</b>	<b>PERCENT</b>
162	CA LUNG	1712	23.91%
161	CA LARYNX	758	10.59%
150	CA OESOPHAGUS	453	6.33%
147	CA PNS	356	4.97%
202	NHL	350	4.89%
187	CA PENIS	295	4.12%
141	CA TONGUE	210	2.93%
151	CA STOMACH	210	2.93%
173	SKIN OTHER THAN MELANOMA	193	2.70%
196	SECONDARY AND UNSPECIFIED L/N	173	2.42%
	<b>ALL MALE CANCERS</b>	<b>7159</b>	

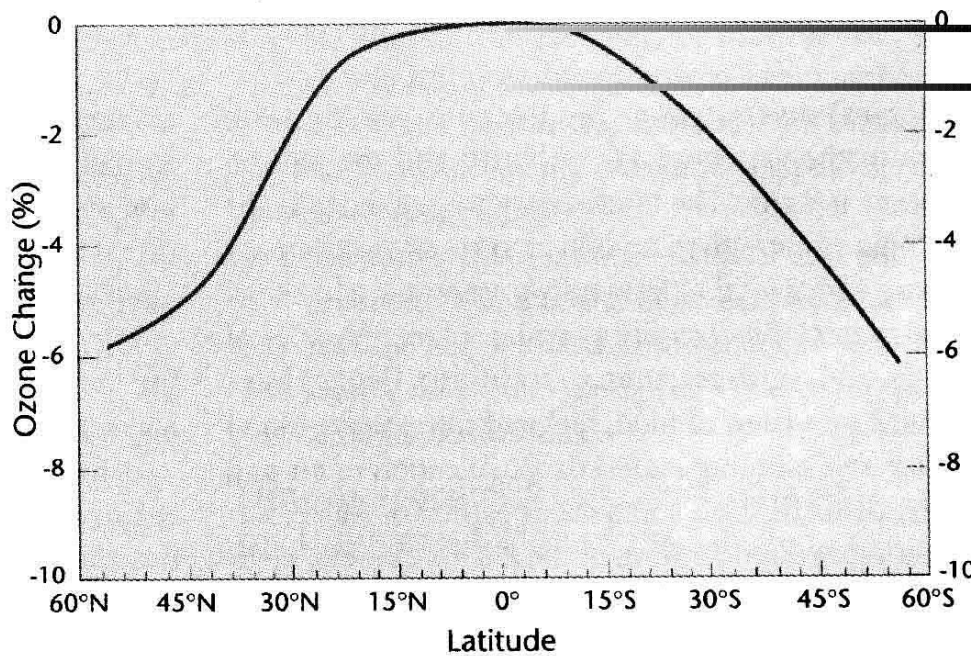
Table 5. TEN COMMONEST FEMALE CANCERS (1993-99)

ICD	TYPE OF CANCER	NO. OF CASES	PERCENT
180	CA CERVIX	2947	28.83%
174	CA BREAST	2787	27.36%
162	CALUNG	897	8.81%
202	NHL	257	2.52%
161	CALARVNX	221	2.11%
150	CAOESOPHAGUS	205	2.01%
183	CA OVARY	203	1.99%
182	CAUTERINESOQY	184	1.81%
151	CA STOMACH	167.	1.64%
173	SKIN OTHER THAN MELANOMA	161	1.58%
	ALL FEMALE CANCERS	10187	

Serial No.	Year	Hospital	
		Yangon Eye Hospital	Mandalay Eye, Ear, Nose and Throat Hospital
1.	1991	3582	*
2.	1992	3342	*
3.	1993	3483	*
4.	1994	3459	*
5.	1995	3661	*
6.	1996	3967	*
7.	1997	3741	874
8.	1998	3289	798
9.	1999	2655	806
10.	2000	3021	792
11.	2001	4094	1167

\* Data not collected.

Table (6). Numbers of patient of eye disease "cataract" who take treatment at the government hospital.



Fi— North-to-south ozone depletion, 1979-1997

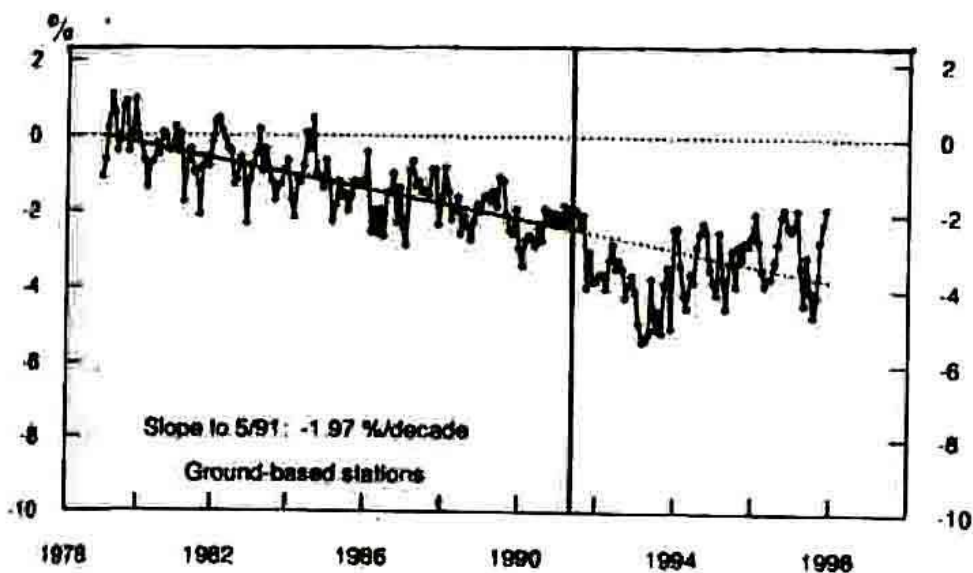


Figure 2— Deviations in total ozone (expressed in per cent of baseline monthly mean), area-weighted over 60°S–60°N from ground-based stations averaged in 5° latitude zones. A seasonal trend model, including solar and Quasi-Biennial Oscillation effects, was fitted to ozone over the period January 1979 to May 1991. The bold vertical line is the time of the Mt. Pinatubo eruption in May 1991.

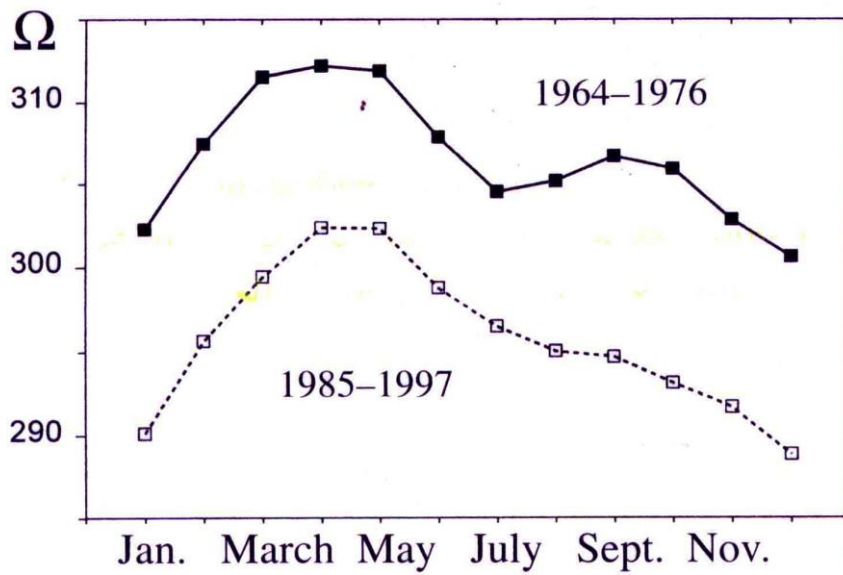


Figure 3— Global ozone average (area-weighted) for two periods as function of season (*Updated from Bojkov and Fioletov, JGR, 1995*)

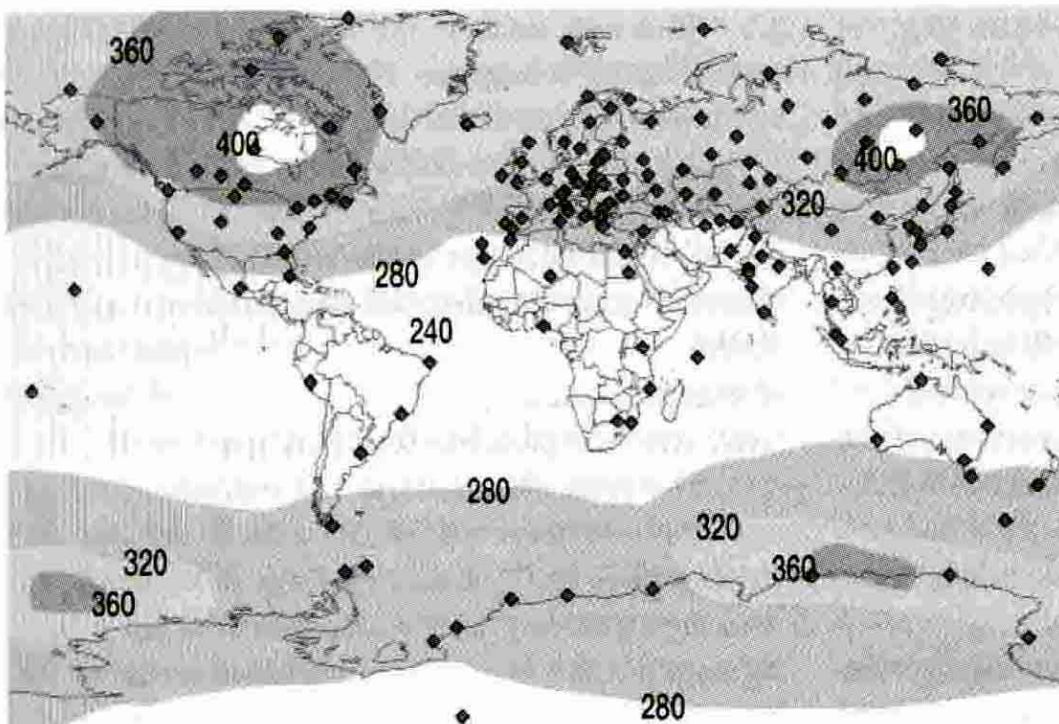
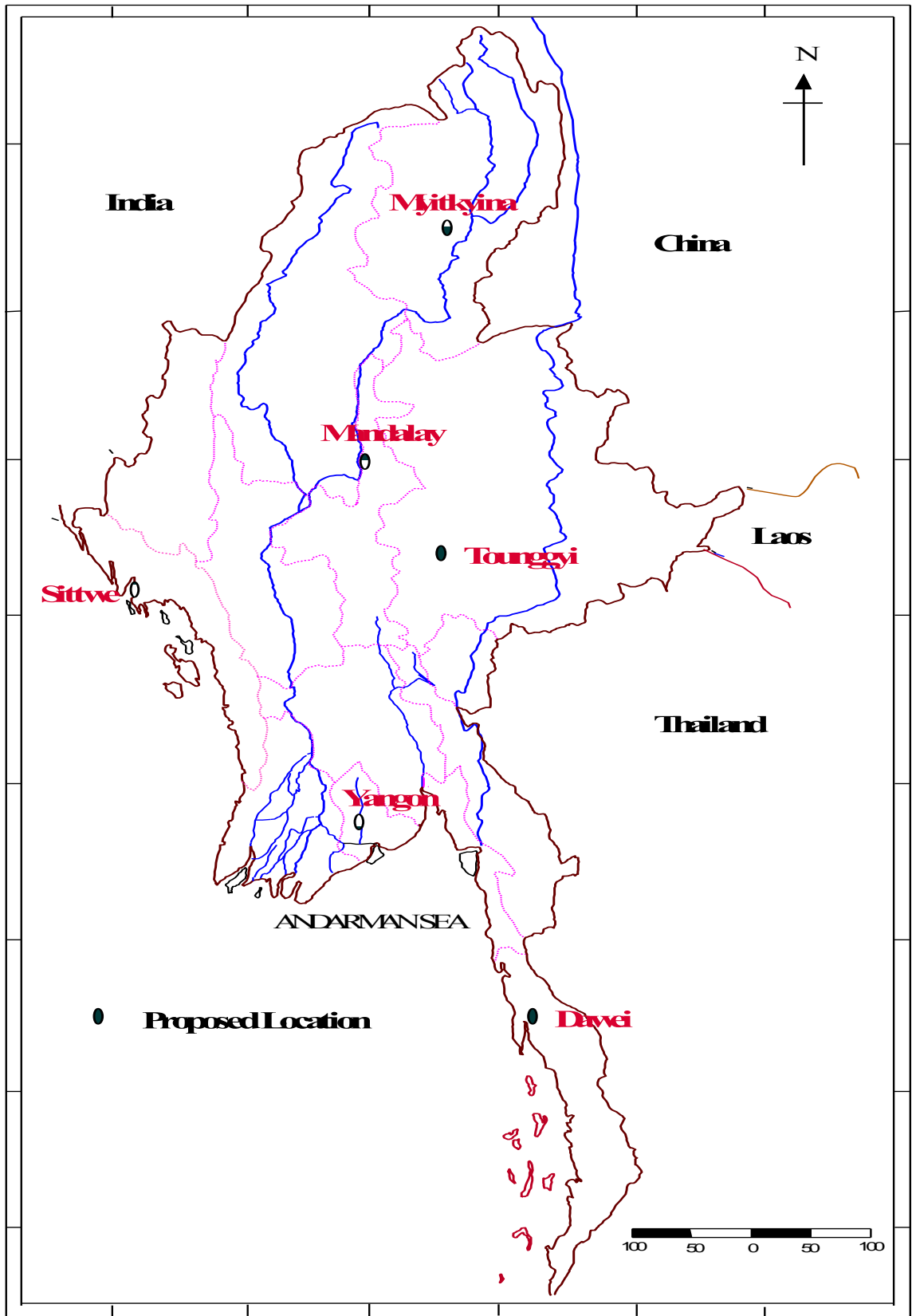


Figure 4— Average total ozone distribution: location of WMO ground-based ozone network





**Figure 5. Proposed location for installation of radiation and ozone measuring instrument**

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