MEMBER REPORT

ESCAP/WMO Typhoon Committee

9th Integrated Workshop

State Hydro-meteorological Administration

DPR Korea

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Contents

I The review on tropical cyclones affected/impacted in DPR Korea in 2014

I. 1 Meteorological Assessment

The DPR Korea is often affected by typhoon during July ~ September due to its geographical position and climate change. Recently, DPR Korea was twice affected by typhoon in 2011, 4 times in 2012 and was not directly affected in 2013 for the first time in 17 years after 1996.

In the typhoon season of 2014, typhoon MATMO (No.1410) and NAKRI (No.1412) affected DPR Korea.

I. 1. 1. Typhoon MATMO(No.1410)

The typhoon MATMO (No.1410) was generated at 18:00UTC on 17 July in the east sea of Philippines. MATMO moved northwest ward and landed Jiangxi Province of China. It started decaying and turned northeast. After this, MATMO entered into Korean West Sea and became an extra tropical low at 06:00UTC on 25 in July . It kept moving northeast and affected on whole area of DPR Korea.

Heavy rain fell in northwest area of DPR Korea in 25-26 July. It exceeded 200mm in Kusong (298mm), Anju (293mm), Nyongbyon (233mm) and Kaechon (229mm). There were more than 100mm of rain in Pyongyang and South, North Pyongan Provinces as well as most areas of Jagang Province, South Hamgyong Province and Kangwon Province. The high wind speed was measured in the Kaesong (24m/s), and Kumchon (20 m/s). In the early morning of July 26, the tide gauge in Haeju reported the tide level of 0.8m.

I. 1. 2. Typhoon NAKRI(No.1412)

Typhoon NAKRI (No.1412) was generated in the east sea of Philippines at 18:00UTC on 29 July. After this it moved northwest and turned northeast direction at 0600UTC on 2 August west of Jeju Island. NAKRI weakened into a tropical depression in the Korean west Sea at 1800UTC on 3 August. It passed through middle areas Korean Peninsula and entered Korean East Sea effecting on the region of Kangwon province. The maximum point rainfall was 121mm in Masik Hill.

I. 2 The hydrological Assessment

Under the nfluance of MATMO (No.1410), the rivers in the west coast regions including Amrok River, Chongchon River and Taedong River were flooded during 25- 26 July, but as a result of long drought from the spring in this year, comparatively those floods were not heavy, though it rained heavily in the whole region in 25-26 July

Under the influance of NAKRI(No.1412), it rained only in some areas of Kangwon Province, so any flood did not occur.

I. 3 The social and economic Assessment

As a result of long drought from spring till middle of July in 2014, more than 80~90mm of rain infiltrated into soil, so there was no loss of life by the flood. And during the flood by typhoon, the average water level in all the reservoires in DPR Korea increased only 8~15% compared with the period before it rained.

But when the typhoon MATMO passed through DPR Korea, it caused strong wind, temporary buildings in some areas were destroied and some facilities were damaged.

I. 4 The regional cooperation Assessment

SHMA(the State Hydrometeorological Administration) of DPR Korea receives the live transmission such as the name of the typhoon , its position , central atmospheric pressure , direction and speed, maximum wind speed, and typhoon track forecast data of 5 days at intervals of 3 hours from the RSMC, Tokyo regional centre of WMO. And SHMA receive routine meteorological data and products via GTS and CMACast and used as a basic data for numerical weather forecast and observation data of DPR Korea are transmitted.

In the future, it is necessary to strengthen the regional cooperation for the swift receipt of the typhoon data issued from typhoon warning center and the forecast data issued from oversea forecast centers.

II The review on the progress made in main effective branches

1. *The improvement of the typhoon track forecast*

The CMFI (Central Meteorological Forecast Institute) in SHMA constructed the typhoon database of the past period, and has analyzed the typhoon affected on DPR Korea by intensity levels on a yearly basis, and serve the customers with typhoon data including the historical occurrence of typhoons, typhoon track, and numbers of influence.

And in the numerical forecasting products from several countries, the typhoon track are collected and by analyzing its statistical characters the statistical typhoon forecast are carried out with by using the composite method, and the position of the typhoon on a hourly basis and the intensity in the centre of pressure, the range of influence are forecasted.

The typhoon forecast support system developed in CMFI analyze and evaluate the trend of track forecast from forecast centers of several countries and assists the forecasters to decide the typhoon track forecast according to its concentration and dispersion.

Identified opportunities/challenges, if any, for further development or collaboration:

Summary Table of relevant KRAs and components (please tick boxes, can be more than one, as appropriate):

KRA=	1	2	3	4	5	6	7
Meteorology	√						
Hydrology				√			
DRR				√			
Training and research							
Resource mobilization or regional collaboration							

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2. *Advance in numerical weather prediction model*

The MSM that is operational regional model of NWP laboratory in CMRI was upgraded on 1 July 2014 and the highlights in the upgraded MSM are as following

- increasing of horizontal resolution 20km to10km
- introducing of BMJ scheme for convective process
- extending of time range of prediction 36h to 48h.
- accelerating of MSM code, using of CUDA FORTRAN and GPU device

The capability for predicting TC tracts and intensities of MSM has been improved significantly.

Identified opportunities/challenges, if any, for further development or collaboration:

Summary Table of relevant KRAs and components (please tick boxes, can be more than one, as appropriate):

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Meteorology	√						
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3. *The decrease of life losses from the disasters by the typhoon*

In order to prevent the disasters by typhoon, DPR Korea has established the typhoon alarm system and takes great care to reduce the damages by all possible means.

In 2012, some parts of DPR Korea including Komdok region were greatly damaged by the heavy rain and flood, but by the state investment, the aftermath were completely disappeared, and after that the loss of life and property by the typhoon were greatly reduced.

Identified opportunities/challenges, if any, for further development or collaboration:

Summary Table of relevant KRAs and components (please tick boxes, can be more than one, as appropriate):

KRA=	1	2	3	4	5	6	7
Meteorology							
Hydrology							
DRR	√	√		√	√		
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4. *The improvement of the typhoon warning system*

When the typhoon occurred, the SHMA of the DPR Korea informs typhoon data including typhoon track forecast via computer network by hydro-meteorological data service system, and if the typhoon would be affect on DPR Korea, the typhoon data and forecast are regularly informed through by computer network, broadcast, and telephone network.

And in every province, cities and counties the early warning systems are established to prevent the damages by flood, downpour and landslides owing to the typhoon by using all warning means including regional wire broadcasting.

At present the work to establish the effective warning system including the alarm through hand-phone network is in progress, to prevent all kinds of typhoon-induced disasters.

Identified opportunities/challenges, if any, for further development or collaboration:

Summary Table of relevant KRAs and components (please tick boxes, can be more than one, as appropriate):

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Meteorology	√						
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5. *The mass* enlightenment *activities on typhoon*

The DPR Korea government is carrying out the mass enlightenment activities on typhoon to minimize the social-economic effects by the typhoon-induced disasters.

And also in order to reduce the damages by flood, downpour and landslides, the headquarters for preventing flood damages are formed in central region and every regional units during the rainy seasons and take measures in advance by enlightenment activities.

The workshop for drawing the map of the flood danger are organized regionally and the evacuation exercises to evacuate in time in case of flood are carried out.

Identified opportunities/challenges, if any, for further development or collaboration:

Summary Table of relevant KRAs and components (please tick boxes, can be more than one, as appropriate):

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6. *The improvement of management on typhoon-induced hazard*

The cabinet of DPR Korea formed the permanent State Flood Damage Prevention Commission and are running it. And the State Disaster Prevention Bureau has also been organized and it is drawing up the laws and rules concerned with damage prevention politics and invest the state fund into the damaged regions. And the basin water control headquarters formed on the main river basin units basis, is controlling the barrages and reservoirs in unified way, thus preventing the damages by the floods.

In every spring and autumn, the state fixes on the National Mobilization Period for Land Management and in this period, tree plantings and river improvement works are carried out all over the country.

Identified opportunities/challenges, if any, for further development or collaboration:

Summary Table of relevant KRAs and components (please tick boxes, can be more than one, as appropriate):

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7. *The strengthening of recovery capacity of the units for damages by the typhoon*

In accordance with the general plan of the flood prevention headquarters in every provinces, cities and counties the elimination of danger elements, drawing of danger maps, evacuation exercises and mass enlightenment activities are vigorously carried out thus, the abilities of local units are strengthened, as a result, numbers of families affected by all kinds of damages by typhoon are decreasing remarkably every year throughout the country.

Identified opportunities/challenges, if any, for further development or collaboration:

Summary Table of relevant KRAs and components (please tick boxes, can be more than one, as appropriate):

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8. *The strengthening of regional cooperation*

In order to cope with the typhoon effectively, the regional cooperation between the countries affected by the typhoon, is badly needed. The DPR Korea is taking practical measures to prevent the damages by the typhoon under the active cooperation with the typhoon Committee.

The DPR Korea, as a member state of typhoon Committee, will actively participate in international conferences and scientific symposiums organized by the typhoon Committee and introduce the effective methods to prevent every kind of damages by the typhoon and will strengthen the international cooperation further.

Identified opportunities/challenges, if any, for further development or collaboration:

Summary Table of relevant KRAs and components (please tick boxes, can be more than one, as appropriate):

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Training and research							√
Resource mobilization or regional collaboration							√

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9. *The relaxation of the danger elements by the typhoon*

Recently, the DPR Korea is building large scale and medium size reservoirs including the Huichon waterpower station on a large scale with the state investment and continue the river improvements and the afforestation for erosion control, thus, is taking measures to prevent the flood damages during the rainy season.

Identified opportunities/challenges, if any, for further development or collaboration:

Summary Table of relevant KRAs and components (please tick boxes, can be more than one, as appropriate):

KRA=	1	2	3	4	5	6	7
Meteorology							
Hydrology		√					
DRR		√			√		
Training and research							
Resource mobilization or regional collaboration							

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10. *The strengthening of training of the professionals*

The DPR Korea established regular university education system including the Kim Il Sung University and Hamhung Hydraulic Power Science University for training the professionals in the fields of disaster prevention and established college system including the Land Management and Environmental Protection College and trains the engineers.

Identified opportunities/challenges, if any, for further development or collaboration:

Summary Table of relevant KRAs and components (please tick boxes, can be more than one, as appropriate):

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Meteorology							
Hydrology							
DRR							
Training and research				√		√	
Resource mobilization or regional collaboration							

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11. *The state organization system for preventing the damages by typhoon and flood*

In DPR Korea the State Flood Prevention Committee which included the members of the concerned ministries and commissions in the cabinet, and non-permanent flood prevention headquarters are established in power organs of every provinces cities and countries and they are organizing and commanding the nationwide or local flood prevention work.

And the basin water control headquarters including Taedong River Flood headquarter are formed and they carry out the work of controlling reservoirs flood management.

The SHMA during June to September, observation of the rivers and reservoirs are being carried out for flood control and runs the real time flood forecasting system, and informs to those organizations with flood forecast and warning on the heavy rain.

Identified opportunities/challenges, if any, for further development or collaboration:

Summary Table of relevant KRAs and components (please tick boxes, can be more than one, as appropriate):

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Hydrology	√						
DRR		√					
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Key Result Area(KRA-1): 태풍관련재해로부터 생명손실의 감소

Key Result Area(KRA-2): 태풍으로 인한 사회경제적 영향을 최소화

KRA-3: 생활의 질개선을 위한 태풍관련 효과들의 강화

KRA-4: 여러분야에서 태풍관련 재해위험 관리의 개선

KRA-5: 태풍관련재해들에 대한 단체들의 회복능력강화

KRA-6: 태풍관련위협들에 대한 정확하고, 시기적절하며 리해하기 쉬운 정보산생과 제공을 위한 능력개선

KRA-7: 태풍위원회유효성, 능률과 국제적 협조의 강화