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भारतीय वन्यजीव संस्थान
Wildlife Institute of India

No. WII/DWII/Misc./03/2018

Date: 28 August, 2018

To,

Principal Chief Conservator of Forest
& Chief Wildlife Warden
Government of Assam
Araya Bhawan, Panjabari, Guwahati - 781037
Assam
Email: pccf.wl.assam@gmail.com

**INFORMATION PROVIDED
UNDER RTI**

Sub.: Submission of report 'Railways Lines in Elephant Habitats: With Specific Reference to Deepor Beel, Assam' - reg.

Sir,

With reference to the above, I am pleased to submit the report 'Railways Lines in Elephant Habitats: With Specific Reference to Deepor Beel, Assam' based on site visit made by Dr. Bivash Pandav, Scientist, WII.

Thanking you.

Yours faithfully,

(Dr. V.B. Mathur)
Director

Tel.: +91-(0)135-2640910 (Off.); Mob.: +9412054648
Fax: +91-(0)135-2640117; Email: vbm@wii.gov.in, dwii@wii.gov.in

Encl.: as above.

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पत्रपेटी सं० 18, चन्द्रबनी, देहरादून - 248001, उत्तराखण्ड, भारत
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ई-मेल / E-mail: wii@wii.gov.in, वेब / website: www.wii.gov.in

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पत्रपेटी सं० 18, चन्द्रबनी, देहरादून - 248001, उत्तराखण्ड, भारत

Railway lines in elephant habitats: with specific reference to Deepor Beel, Assam



(A group of wild elephants crossing a railway line in Hosur Forest Division, Tamil Nadu. Photo: Shri. Baskar, Deputy Ranger)

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UNDER RTI

Bivash Pandav
Scientist - F
Department of Endangered Species Management



भारतीय वन्यजीव संस्थान
Wildlife Institute of India

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Introduction:

Asian elephants are primarily threatened by habitat-related factors such as loss, degradation and fragmentation, and human–elephant conflict. In particular, habitat fragmentation can isolate the populations in to small subpopulations, which suffer enormous extinction risk. In India, creation and expansion of linear infrastructure such as railway lines, roads, power transmission lines and associated development have been the main cause of fragmentation of elephant habitats and other sensitive wildlife areas. Lately, due to impetus for rapid economic growth, and fast and safe movement of goods and passengers, there is manifold increase in the creation, expansion, up gradation and modernization of railway network in the country, some of which passes through ecologically fragile elephant habitats.

It is noteworthy that as part of modernization of Indian Railways, most of the erstwhile meter gauge lines were upgraded in to broad gauge lines, connecting them with main routes resulting in increased speed of trains and steep rise in the traffic volume. In numerous cases, the single lines were doubled and energized as well. While there is no doubt that railways have revolutionized and eased the movement of passengers and freight across the country, thereby significantly contributing to the nation's economic growth, such development has, in some cases, come at the expense of serious ecological and environmental consequences. As with the case of elephants and their habitats, the impact of railway-lines have been quite alarming and in some cases, even irreparable.

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Run-over of elephants by trains:

Railway lines impact elephants and their habitats in myriad ways. The most direct and perceptible impact is the run-over of elephants by trains in the railway tracks. There has been a steep increase in the number of collision-related mortalities of wild elephants due to trains across the country (Figure-1):

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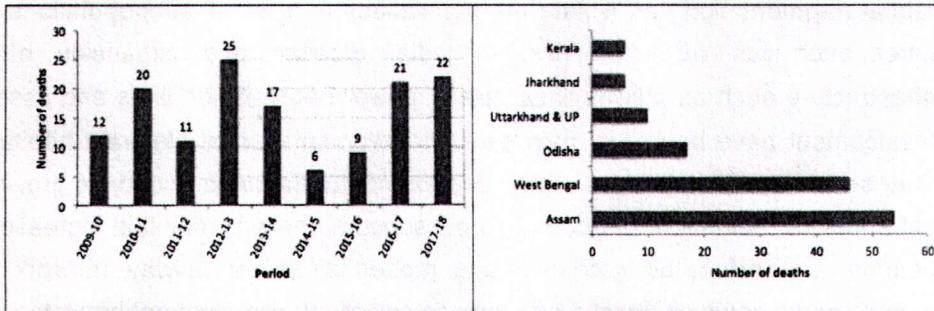


Figure-1(left): Period-wise number of elephant deaths due to trains reported in India.

Figure-2 (right), states with highest number of elephant deaths due to trains

On an average, over 25 elephants die each year due to run-over by trains. While elephant habitats across the entire country are threatened by railway lines, the northeastern elephant range comprising of the states of Assam and North Bengal are the most affected followed by Odisha and Uttarakhand. From the year 2009 to present, over 100 elephants were mowed down by trains in Assam and North Bengal alone.

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Permanent effects on the habitat:

In addition to direct collisions, railway lines passing through elephant habitats have multitude other serious effects on the habitat and the elephant populations as well. Creation, expansion and maintenance of railway lines can majorly affect the soil, humus, local microclimate and drainage leading to drastic change in vegetation structure and floristic. Invasive, non-edible weeds may proliferate from the site of linear infrastructure and penetrate in to habitat reducing the natural forage base for elephants and other herbivores thereby reducing the overall carrying capacity of the habitat. While the area cleared for creating railway infrastructure may be minimal (just a few tens of meters), its edge effects, that of degradation of habitat, can penetrate in to surrounding elephant habitats for several kilometers. Thus, in a habitat where there is a honeycomb of different linear infrastructures at varying distances, the resulting effect on the habitat could be colossal.

Abandonment of the habitat by elephants:

Chronic, multifaceted effects on the habitat can adversely affect the elephants' home range (the area traversed by animals for fulfilling their basic life-history needs) itself. Elephant groups are governed by rank hierarchies. Simply put, in a given habitat not all elephants can operate everywhere and different groups

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have different seasonal home range patterns to which elephants adhere to steadfastly. Therefore, although we usually assess the impact of railway infrastructure on habitat in terms of the gross extent of forest area lost, it is important to note that different elephant groups operating in the area could be affected differentially with some of them losing only a fraction of their home range, while a few groups could lose a substantial portion of their home range. The groups that lose a substantial portion of their home range may abandon the area itself and get displaced to new areas. In our country, remnant forests are highly limited and therefore, displacement of elephant groups from their well set home ranges lead to conflict in new areas. Thus, it is very much possible that in an intact elephant habitat, creation of railway infrastructure and others could actually trigger long-term conflict between people and elephants with serious ecological, social and political consequences.

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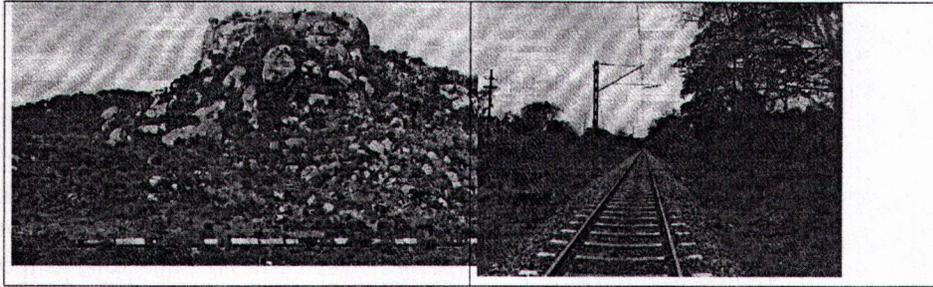
Behavioral change and other societal effects in elephants:

A recent seminal paper in Science, a leading scientific journal, has highlighted that rapid increase in human activity has actually caused significant shifts in temporal activity patterns of wild animals with most of them turning nocturnal (refer to Gaynor et al, 2018). Such changes could seriously affect the long-term survival prospects of animals as chronic stress can affect their physiology. Railway lines – both during creation and while being operational are a major source of noise and ancillary disturbance for elephants and other wildlife. While, some of the individuals may get habituated to such stressors, especially if the traffic volume is minimal, a vast majority of elephants may suffer range of complications that include significant modifications in their natural behavior. Elephant groups that are generally shy and timid towards people overtime may lose their shyness if they are continuously exposed to human-induced disturbances in their habitat. The change in behavior has long-term ramifications on conflict management as well. Further, if some of the older animals (such as the matriarchs) get killed due to collisions, then the herds can get disoriented due to loss of spatial/ survival knowledge. Such herds can get in to conflict with people by traversing in unfamiliar areas

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Picture-1(left): A goods train passing through an elephant habitat in the Eastern Ghats, South India. Picture-2 (right), fully energised broad gauge track cutting through a critical elephant habitat in Rajaji Tiger Reserve, North India

Mitigating the impacts of railways on elephant populations and habitats:

Appreciably, the Ministry of Environment, Forests and Climate Change; the state forest departments and government institutions like the Wildlife Institute of India in collaboration with several institutions and individuals are endeavoring hard to advance a plethora of mitigation measures to reduce the impact of railways on elephant populations and habitats. This, however, is far from easy as any impact on the elephant habitat by the railway infrastructure will be an indelible dent and repair work is seldom possible. The most effective long-term strategy in most cases would be realignment of the infrastructure from the elephant habitats and restoration, wherever feasible.

Increasingly, there is a vociferous demand from the Railways about real-time intimation of elephants in the railway lines so that the trains can be slowed down. This demand, although logical the railways' point of view, is often impractical to serve. In contrast to common perception influenced by high-definition wildlife documentaries from African savannah, Asian elephants occur in dense forests where visibility drops in a few meters. Elephants are also very shy and are potentially dangerous as well and therefore, it is impractical to continuously follow elephant herds and individuals and alert the railways in time. Further, elephants, despite their bulk are incomprehensibly fast and can cover several miles in a matter of few minutes during the phase of "directed movement". Thus, before even the message of elephants approaching the track could reach the authorities concerned, elephants would land in the area! Thus, all-time vigilance in elephant habitats is exigent. Secondly, although elephants usually stick to their well-trodden paths, these paths are not fixed and they may change their paths from time to time. This is especially

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the case in flat areas where there are no topographic constraints for elephants to traverse. Thus, it is important to note that elephants can approach the railway tracks from anywhere within their habitat.

The case of railway-related elephant mortalities in Deepor Beel, Assam:

Over the years, 13 elephants have been killed and five injured due to train hit in a relatively small stretch of railway track passing along the southern edge of Deepor Beel Ramsar site, Guwahati. Elephants from Rani Reserve Forest (RF) regularly use Deepor Beel using traditional trails to gain access to water. The railway track and a road cut through all these identified elephant trails leading from Rani RF to Deepor Beel (Figure 3). Besides, rapid urbanization over the years on private lands between Rani RF and Deepor Beel is also blocking several of these traditional elephant trails. This will potentially lead to severe human elephant conflict in near future. While some of these elephant trails near dense human habitations can be blocked through Elephant Proof Trenches (EPT) and electric fences, it is not desirable to do the same along the entire stretch of Rani RF on the edge of Deepor Beel.

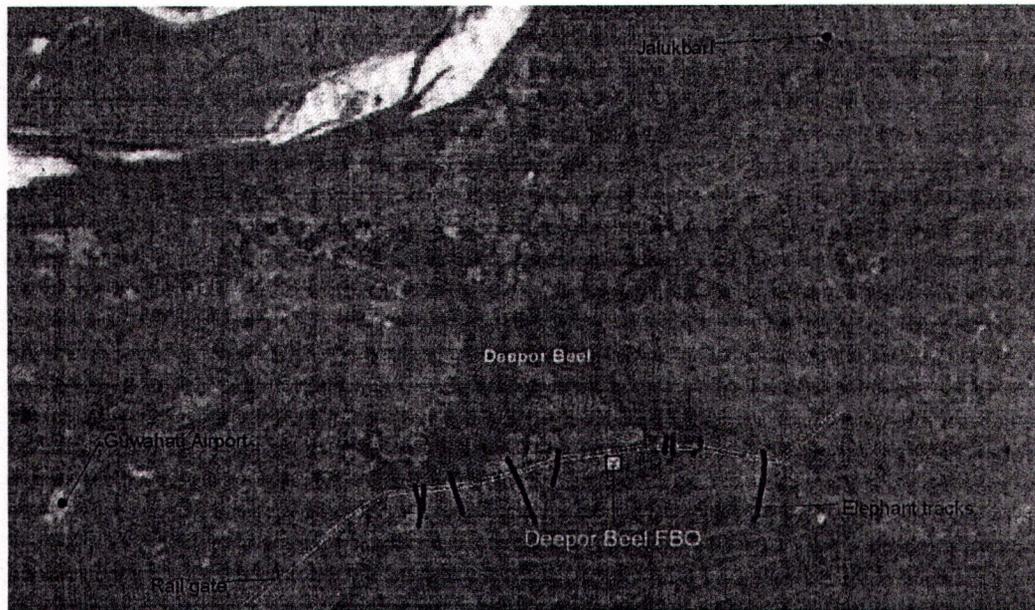


Figure 3. The railway track along Deepor Beel cuts through nine identified elephant trails that are regularly used by elephants to gain access to water from Rani RF to Deepor Beel.

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Mitigation Measures Proposed:

Based on our observations during the field visit and discussion with field staff we recommend the following mitigation measures to reduce elephant mortality on the railway track:

- I. Speed restriction – Restriction of speed of train passing through this stretch should be the immediate measure to prevent collision with elephants on the track. We recommend a speed limit of 30km/hour along this stretch for all the trains passing on this stretch.
- II. Regular patrolling along the railway track – The ongoing efforts of Assam Forest Department need to be continued along this railway track on a regular basis. Designated patrolling team need to actively patrol along this track specifically during night time and upon detection of elephant movement near the track a proper mechanism should be put in place to pass on the information to the locomotive driver.
- III. Construction of a tunnel between Gate No. 273 and 274 – The long-term solution to prevent collision with wild elephant lies in construction of a tunnel in the hill tract between railway gate no. 273 and 274. The railway track after bridge no. 738 passes through a bend along the edge of a hill. This stretch of railway track owing to its terrain is most prone to elephant hit. In order to avoid collision with wild elephants, possibility of excavating a tunnel through the hill between gate no. 273 and 274 should be explored. A track passing through the tunnel will be the long-term solution to this problem.

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NORTHEAST FRONTIER RAILWAY

Construction Organization

Office of the
General Manager (Construction)
N.F. Railway/Maligaon

No. W/362/CON/N-K/Misc/2018/NGT/status

Dated: 10.12.2018

To,
Dr. V.B. Mathur
Director, Wildlife Institute of India
Post Box No. 18, Chandrabani,
Dehradun – 248 001
Uttarakhand, India

**INFORMATION PROVIDED
UNDER RTI**

Handwritten notes:
A Sworn Bandha
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27/11/18

Sub: Scientific study from Wildlife Institute of India, Dehradun to identify movement – path of elephants in Deepor Beel area, Assam and mitigation measures suggested – regarding.

- Ref: (i) Your letter No. WII/DWII/Misc./03/2018 dated 28.08.2018 to Principal Chief Conservator of Forest & CWLW, Assam (PCCF & CWLW)
- (ii) PCCF & CWLW, Assam, Aranya Bhawan, Panjabari, Guwahati letter No. WL/FG/O.A. No.19/2014/EZ(NGT) dated 28.08.2018.
- (iii) This office letter No. W/362/CON/N-K/Misc/2018/NGT dated 15.11.2018 to PCCF & CWLW, Assam.

Sir,

In terms of letters at reference (i) and (ii) above, the mitigation measures suggested by you to prevent collision of train with Wild Elephants in Deepor Beel area, Assam has been examined by Railway and the proposal was found feasible by construction of artificial Tunnel for accommodating Railway tracks with provision of Elephant corridor above these Tunnels with proper slope connecting the corridor to Deepor Beel wetland. The feasibility report alongwith schematic drawing of this scheme was forwarded to PCCF & CWLW, Assam vide letter under reference (iii) above on dated 15.11.2018 for their kind perusal and decision on the proposal.

But, it is worth mentioning that as per directions of Hon'ble National Green Tribunal/Eastern Zone, Kolkata, a meeting of the Committee was held on 03.12.2018 in Assam Secretariat. The Railway Officials attending the meeting tried to raise the above issues for discussion, but Chief Secretary, Govt. of Assam did not allow them to raise the above issues and advised Railway to communicate directly with Wild Life Institute of India, Dehradun and to submit directly before Hon'ble National Green Tribunal.

In view of above and as suggested by PCCF & CWLW, Assam, the suggested mitigation measures, as developed by Railway, is enclosed herewith for your kind perusal please.

Handwritten signature:
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27/12/18
DATE: 27/12/18

The main features of the proposal are given below: .

- (1) Land of approx 65,550sqm (570mx115m) area shall be used towards Deeporbeel side beyond the Railway Land to construct the proposed ramp of the corridor for easy approach to Deeporbeel by the elephants.
- (2) Existing PWD road is proposed for realignment by diverting it towards the hill above the tunnel by eliminating existing Level Crossing gates. Approximate 1.1km long road shall be reconstructed including the approach roads of 300m on either end. The road being constructed on the hill slope above the tunnel can be accommodated within Railway Land boundary. However, this proposed road being planned with approach roads of suitable gradient (1 in 30) required consent of concerned State PWD and the job of construction of new road including 300m on either side approaches on the railway land as well as outside the Railway Land boundary to be taken up by the State PWD.
- (3) Boundary walls on both sides of railway tracks upto the location of the bridge are being constructed to prevent entry of elephants inside the tunnel and crossing of track in the identified corridor.
- (4) The existing Forest Office complex including Watch Tower near the level Crossing gate NN – 273 needs to be relocated to a suitable location.
- (5) 02 Nos. of 33 KV HT Electrical Towers to be shifted towards Deeporbeel to facilitate the construction of the Ramp of the corridor.

You are requested to kindly accord your approval on the proposal of works for mitigation measures as above to comply the directives of Hon'ble Green Tribunal. A line of confirmation is highly solicited.

Yours faithfully,

DA : As above

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(S.N. Singh)

Chief Administrative Officer/Con-I
N.F. Railway, Maligaon, Guwahati

Copy to:

1. Chief Secretary, Govt. of Assam : For kind information please.
2. Principal Chief Conservator of Forest & CWLW, Assam : For kind information please.
3. Principal Chief Engineer/N.F. Railway, Maligaon : For kind information please.
4. DRM/Rangiya Division, Rangiya: For kind information please.
5. Deputy Commissioner/ Kamrup (Metro) – For kind information please.
6. Chief Engineer, PWD (Roads), Assam Chandmari, Guwahati – 781 003 – For kind information and needful action please.
7. Executive Director, Power Grid Corporation of India Ltd., 102 Royal Centre, Opp S B Deorah College, Ulubari, Guwahati – 781 007 – For kind information please.

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GOVERNMENT OF ASSAM
OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS
& CHIEF WILDLIFE WARDEN, ASSAM:: PANJABARI, GUWAHATI-781037

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No. WL/FG/OA No.19/2014/EZ

Dated 10th January, 2019

To,

- 1) Chief Administrative Officer/ Con-I
N.F.Railway, Maligaon
- 2) Shri N. Brahma, Principal Chief Engineer,
N.F.Railway, Maligaon
- 3) Chief Engineer, PWD (Roads), Assam, Chandmari, Guwahati
- 4) Executive Director,
Power Grid Corporation of India Ltd.
102, Royal Centre, Opposite S.B.Deorah College, Ulubari, Guwahati-07

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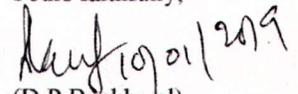
Sub.: Mitigation measures for movement of elephants in Ajara-Kamakhya railway segment near Deepor Beel with reference to NGT case O. A.No.19/2014

Ref.: N.F.Railway, Office of GM (Construction) letter no. W/362/CON/N-K/Misc/2018/NGT/statu, dated 10.12.2018

Sir,

With reference to the above, I am to bring to your kind notice that Wildlife Institute of India has suggested short term and long term mitigating measures for movement of wild elephants to and from Deepor Beel. As per the recommendation of the Wildlife Institute of India, the Railway authorities are to carry out the mitigating measures. In the meeting held by Chief Secretary, Govt. of Assam on 3.12.2018, the Railway authorities were also conveyed categorically that they should work on the recommendation of the Wildlife Institute of India, and in case any clarification is required, the Railway authorities should discuss the matter directly with the Wildlife Institute of India. Now, the scientist concerned of the Wildlife Institute of India, Dehradun, Dr. Vibhas Pandav is coming to hold discussion with the Railway authorities in Guwahati, I request the Principal Chief Engineer of N.F. Railway to be present on site at **Deepor Beel at 10:00 AM of 12th January, 2019** and sort out the issues with Wildlife Institute of India, PWD (Roads) and Power Grid Corporation Limited (PGCL). The Chief Engineer, PWD (Roads) and Executive Director, PGCL are also requested to attend the meeting at **Deepor Beel at 10:00 AM of 12th January, 2019** with the other two organisations. Forest officials will also be present there.

Yours faithfully,


(D.P. Bankhwal)

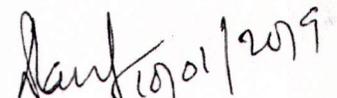
Principal Chief Conservator of Forests
& Chief Wildlife Warden, Assam

Copy to :

1. Additional Chief Secretary to the Government of Assam, Forest & Environment Department, Dispur, Guwahati-06
2. Principal Chief Conservator of Forests & Head of Forest Force, Assam, Guwahati-37. He is requested to depute a territorial wing officer for the meeting at Deepor Beel.
3. Director, Wildlife Institute of India, Chandrabani, Deharadun-248001.

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(D.P. Bankhwal)

Principal Chief Conservator of Forests
& Chief Wildlife Warden, Assam

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From Office of the
Central Public Information Officer (CPIO)
Wildlife Institute of India, Dehradun

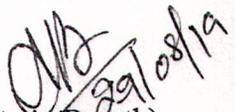
Dated 29.08.2019

Sub: Copy of letters mentioned in letter no. WII/DWII/Misc./03/2018 dated 16.01.2019 under RTI Act, 2005 – regarding

Shri Nripen Teron, Assam has submitted an online RTI Request Reg. No. WLIOI/R/2019/50028 dated 28.08.2019 (RTI-36/2019-20) for providing point-wise reply/ information. In this context, a copy of the same is enclosed herewith.

Since the desired information pertains to **Director Office**, and the same are required to be sent to the applicant **on or before 21.09.2019**, it is requested to please arrange to provide the information **in duplicate duly signed by the concerned authority of the Institute** so that the information can be furnished to the applicant u/s 7(1) of RTI Act, 2005.

RTI-36


(Dr. Anju Baroth)
NO & CPIO (RTI)

Encl: as above.

Director, WII


29/08/19