

## **MANAGEMENT OF THE ASSIGNMENTS OF EMPLOYEES ON IRRIGATION WORKS AT BAGO DISTRICT (1988-2010)**

Win Win Cho\*

### **Abstract**

Bago District is situated in the southern part of the Republic of Union of Myanmar in Bago Region. It is a fertile district which is mainly based on agricultural cultivation. It is an area of heavy rainy season that the low land area of Bago District faces floods. Therefore, the Government of the Union of Myanmar constructed dams, embankments, sluice gates and canals for the development of agricultural sector and to prevent flooding in Bago District since 1988. In order to carry out the tasks for renovation and management of dams, embankments, sluice gates and canals that were already constructed in Bago District, Department of Irrigation organized the management on the assignment of staffs. The management on the calculation of labour forces during the interim period between 1988 and 2006 varies town by town in Myanmar as a whole. Started from 2006, headquarter in Yangon, Department of Irrigation, Ministry of Agriculture and Irrigation, the Government of the Union of Myanmar, therefore specified the method for calculating criterion on employee for the whole country. The methods for calculating criterion on employees consisted of calculating criterion for employee regarding irrigation system, sluice gates and distribution of water to paddy fields on summertime. Department of Irrigation calculated the criterion on employee for the whole country based on the method used during the colonial period. By this method, the assignment of staffs were calculated for *Zaungtu Dam*, *Shwe Pyay (3) Reservoir*, *Zalattaw Reservoir*, *Mazin Dam*, *Alainni Dam*, *Wagatoke Dam*, *Kodukwe Dam*, *Salu Dam* and *Shwelaung Dam* constructed in Bago Township. By the same method, the assignment of staffs were calculated for *Pyinpongyi Dam*, *Bawni Dam*, *Kawliya Dam* and *Baida Dam* situated in Daik-U Township and *Ye Nwe* reservoir located in Kyauktaga township. The aims of this research are to discuss the important part of assignment of staff in irrigation works and to analyze the calculation of labor standards for the assignment of staff regarding dams.

**Keywords:** employees, assignment of staffs and calculation of labour forces

### **Introduction**

Bago District is formed with Kyauktaga, Nyaunglaybin, Daik U, Shwekyin, Waw, Kawa, Thanatpin and Bago Townships. Bago District is an area of heavy rain where the overflow of Bago and Sittaung rivers usually occur in rainy season that the low land areas of Bago District face with floods. The people in Bago District mainly conduct agriculture. Thus, the government of the Union of Myanmar laid down for the implementation of small and medium scales irrigation plans and constructed dams, embankments, sluice gates and canals for the development of agricultural sector. After building these infrastructures, Department of Irrigation conducted the irrigation works of water supply to the agricultural lands, of distribution of water by adjustment and of flood control and its managements on irrigation. In order to implement these irrigation works, the Department of Irrigation also carried out the tasks for renovation and management of dams, embankments, sluice gates and canals that were already constructed in Bago District. The management of Irrigation and Drainage Systems consists of the management to prevent the disasters at least that are monsoon flooding lands and flooding on wards and roads and the assignment of staffs for its management. The assignment of staffs plays an important part for

---

\* History Department, Hinthada University

renovation and management of dams, embankments, sluice gates and canals that are located in Bago District.

### **Aim and Objective**

Aim and objective of this paper are to discuss the important part of assignment of staffs in irrigation works and to analyze the calculation of labor standards for the assignment of staff regarding dams.

### **Data and Method**

This paper is based on the reports and list of the calculation on labour force requirement for dams, embankments, sluice gates and canals from the Department of Irrigation and Water Utilization Management. Moreover, people in charge of the Department of Irrigation have been interviewed and from them collected the data of the calculation of labour forces for the assignment of staff regarding dams. The research method used in the described study includes historical data analysis and policy guideline consideration.

### **Findings and Discussion**

The calculation of criterion on employees regarding the preservation and conservation of dams, lakes and embankments during the interim period between 1988 and 2006 varies town by town in the whole country as well as regarding management on the assignment of employees for dams and embankments constructed in Bago District also differs town by town. Started from 2006, the headquarter in Yangon, Department of Irrigation, Ministry of Agriculture and Irrigation, the Government of the Union of Myanmar therefore defined the method for calculation of criterion on employee for the whole country. In calculating criterion for employee for the whole country, Department of Irrigation calculated based on the method used during the colonial period.<sup>1</sup> In calculating the criterion on employee uniformly, the management on the assignment of employees are that of calculation of criterion on employee concerning with dams and embankments, with sluice gates, with distribution of water to paddy field in summertime and with types of irrigation system.

Regarding the calculation of criterion on employee for dams and embankments, if the surface area of embankment is under five hundred thousand square feet, one person was assigned for one hundred thousand square feet. Supposing the surface area of the embankment is between five hundred thousand and ten hundred thousand square feet, one person was assigned for 1.5 hundred thousand square feet. If the surface area of the embankment is between ten hundred thousand and thirty hundred thousand square feet, one person was assigned for 2 hundred thousand square feet and it was also defined that a person was assigned for 2.5 hundred thousand square feet if the surface area of the embankment is over 30 hundred thousand square feet. Nevertheless, if the grassland was located at the downstream area of the embankment, the labour

---

<sup>1</sup> "ဆည်ကန်တာဝန် ထိန်းသိမ်းခြင်းနှင့်ပတ်သက်၍ အလုပ်သမားစံနှုန်းများ သတ်မှတ်ခြင်း" (The calculation of criterion for employees regarding the preservation and conservation of dams and embankments), Yangon, Department of Irrigation, Ministry of agriculture and Irrigation, Government of the Union of Myanmar, p. 1 (Hereafter cited as *the calculation of criterion for employees*)

force will be calculated as 1.25.<sup>1</sup> In calculating labour force for the embankment and salt-water embankment, if the embankment is under five feet in height, average one person will be assigned for three miles in length and one person was assigned for two miles in length, if the height of embankment was between five and ten feet in height. Three persons will be assigned for four miles in length at the embankment that is above ten feet in height. The specification of criterion for employee regarding the sluice gates constructed at the drainages, if the sluice gates were located at the distant area from the number of dwellings in a settlement, labours were organized for the whole year. In addition, if it was not far from the human dwellings, the labour will be appointed during the rainy season. For the purpose of water supply to the summer paddy fields, the requirement of labour force will be calculated based on the cultivated areas.<sup>2</sup>

The Irrigation Department defined two types of irrigation season and non-irrigation season in the specification of irrigation season for irrigation system for the whole country instead of water supply in the summer and rainy season. However, Director Offices at the respective region defined the irrigation season without specifying from the Headquarter in Yangon as time duration differs from one place to another. In calculating the requirement of labour forces in the irrigated areas for irrigation season in summer, the assignment of labour was made for the main canals and its branch of an irrigation canal that is over 200 cusecs<sup>3</sup> as five persons for four miles. If the branch of an irrigation canal is under 200 cusecs, one person was assigned for one mile. For the non-irrigation season in the rainy season, the assignment was made for the main canals and its branch of an irrigation canal that is over 200 cusecs as one person for one mile and the main canals and its branch of an irrigation canal that is under 200 cusecs as one person for three mile.<sup>4</sup> Moreover, Department of Irrigation conducted uniformity in specifying the criterion for employee for the whole country and it can be observed that the Department of Irrigation defined Irrigation season and non-irrigation season in the irrigated cultivation system without classifying summer and rainy season as the rainfall differs from one place to another.

By this method of calculation, Department of Irrigation assigned labours for nine dams and embankments located in Bago District. In studying the assignment of labour forces for the first constructed dam of *Zaungtu* situated at Bago Township, ten workers were assigned for the whole year and one person for water control gate, one person for business cleaning house security and one person who recorded water level were also appointed. For the irrigation system, fifty-eight person for irrigation season, twenty-nine person for non-irrigation season, one security for Byaiktaw –inn, one security for the irrigated station at the 7<sup>th</sup> and 8<sup>th</sup> branch of an irrigation canal and one security for business cleaning house at Phayagyi, one security for railroad irrigation canal and one security for the 6<sup>th</sup> branch of an irrigation canal were also assigned.<sup>5</sup>

---

<sup>1</sup> "ဆည်ကန်တာဝန် ထိန်းသိမ်းခြင်းနှင့်ပတ်သက်၍ အလုပ်သမားစံနှုန်းများ သတ်မှတ်ခြင်း" (The calculation of criterion for employees regarding the preservation and conservation of dams and embankments), Yangon, Department of Irrigation, Ministry of agriculture and Irrigation, Government of the Union of Myanmar, p. 2 (Hereafter cited as *the calculation of criterion for employees*)

<sup>2</sup> *The calculation of criterion for employees*, p. 2

<sup>3</sup> A unit of flow (especially water) equal to one cubic foot per second.

<sup>4</sup> လူတွေ့မေးမြန်းခြင်း၊ ဦးဇော်မျိုးနိုင်၊ ဦးစီးအရာရှိ (Personal Interview with U Zaw Myo Naing, Chief Officer, Assistant Director Office, Department of Irrigation and Water Utilization Management, Bago Township, on 16 April 2022

<sup>5</sup> //စောင်းတူရေလှည့်ဆည်၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း" (Lists of the calculation on labour force requirement for Zaungtu sluice gate), Bago Township, Irrigation and Water Utilization and Management Department, 2019, p. 1

The lists of calculation for required labored force and its assignment for the *Shwe pyay* (3) Dam, the second dam in Bago Township are five persons for the whole year, one security for business cleaning house, one person for security of water outlet and one person who recorded the water level or the annual rainfall. As there were 5.54 miles in length for the irrigation system, four labour for the irrigation season and two persons for non-irrigation were assigned according to the calculation of labour force requirement.<sup>1</sup>

According to the requirement of labour force for *Zalattaw* Reservoir, the third dam in Bago Township, four labour for irrigation season and two persons for non-irrigation season were to be assigned. By the calculation of labour force requirement for *Zalattaw* Reservoir, five labour forces for the whole year, one security for business cleaning house, one security for water outlet, one person who recorded the water level or rate of rainfall were to be appointed. In the irrigated system, nine labour for irrigation season and one labour for non-irrigation season were also to be assigned.<sup>2</sup>

The lists of calculation for labour force requirement and its assignment for *Mazin* Dam, the fourth dam constructed in Bago Township were six persons for the whole year, one security for business cleaning house, one security for water outlet, one person who recorded water level or the rate of rainfall. As there are 4.03 miles in length for the irrigated system of *Mazin* Dam, three persons for irrigation season and one person for non-irrigation season were to be assigned.<sup>3</sup>

The lists of calculation for labour force requirement and its assignment for *Alainni* Dam, the fifth dam situated in Bago Township were ten person for the whole year, one security for business cleaning house and one security for embankment.<sup>4</sup> In the irrigation system, twelve person for irrigation season and six person for non-irrigation system were to be assigned as there are 11 miles in length at the main irrigation canal and 7.14-mile in length at the branch of an irrigation canal. For the *Wagatoke* Dam that is the sixth Dam situated in Bago Township, the lists for calculation of labour force requirement and its assignment are fourteen person for the whole year, one security for the entrance to the embankment and one person for sluice gate.<sup>5</sup>

According to the calculation on labour force requirement and its assignment for *Kodukwe* Dam that is seventh dam in Bago Township, twenty-four seasonal workers, two security for a business cleaning house, one person who recorded the water level, one security at the station for annual average rainfall and four security for water outlet were to be assigned.<sup>6</sup> The lists of calculation on labour force requirement for *Salu* Dam that is eighth dam located in Bago Township were twelve workers for the whole year, fifteen workers for grassland cultivation area of the dam, one security for business cleaning house, one person who recorded water level or

---

<sup>1</sup> "ရွှေပြည် (၃) ရေလှောင်တံတံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း" (Lists of the calculation on labour force requirement for Shwe pyay (3) Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019, p. 1

<sup>2</sup> "ဇလတ်ထော်ရေလှောင်တံတံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း" (Lists of the calculation on labour force requirement for Zalattaw Reservoir), Bago Township, Irrigation and Water Utilization and Management Department, 2019, p. 1

<sup>3</sup> "မဇင်းရေလှောင်တံတံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း" (Lists of the calculation on labour force requirement for Mazin Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019, p. 1

<sup>4</sup> "အလိုင်နီရေလှောင်တံတံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း" (Lists of the calculation on labour force requirement for Alainni Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019, p. 1

<sup>5</sup> "ဝါးကတုတ်ရေလှောင်တံတံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း" (Lists of the calculation on labour force requirement for Wagattoke Dam), Bago Township, Irrigation and Water Utilization Management Department, 2019, p. 1

<sup>6</sup> " ကိုဒွကွဲရေလှောင်တံတံ၏ လုပ်သားတွက်ချက်မှုစာရင်း" (Lists of the calculation on labour force requirement for Kodukwe Dam), Bago Township, Irrigation and Water Utilization Management Department, 2019, p. 1

annual average rainfall and one security for diversion dam.<sup>1</sup> The lists of calculation on labour force requirement for *Shwelaung* Dam that is the last dam constructed in Bago Township are five seasonal workers, one security for business cleaning house, one security for water outlet, one security for embankment, one security on the camp across Yangon-Bago main road and one person who recorded the water level or annual average rainfall. Both nine workers for irrigation season and five workers for non-irrigation season are to be assigned for the irrigated system at *Shwelaung* Dam.<sup>2</sup>

The Ministry of Agriculture and Irrigation constructed four dams at Daik-U Township in Bago District. Among these four dams, lists of calculation on labour force requirement for the first constructed dam of *Pyinpongyi* in Daik-U Township were three workers for the whole year, one security for water outlet and water diversion canal, one security for embankment. Moreover, one security for business clearing house and guesthouse and one person who recorded the water level or annual average rainfall were also appointed. For the irrigation system, twenty annual workers were assigned.<sup>3</sup> The list of calculation for required labored force and its assignment for the *Bawni* Dam, the second dam in Daik U Township are eighteen person for the whole year, one person for security of water outlet and one person for security of water diversion canal were appointed. In the irrigation system, forty-seven annual workers, one person for business clearing house and one security for *Kadokeywama* station were organized.<sup>4</sup> According to the lists of calculation on labour force requirement for the third constructed dam of *Kawliya*, seven workers for the whole year, one person for water diversion canal, one security for water outlet and two person who recorded the water level or annual average rainfall were appointed. Regarding the irrigation system, sixteen workers for the whole years, one security for *Pwelay* station, one security for guesthouse, one security for business cleaning house at water diversion dam and one person for *Shansu* station were required to be assigned.<sup>5</sup>

For the fourth dam situated at Daik-U Township, the lists of calculation on labour requirement for *Baida* Dam were five workers for the preservation season, one person for grassland cultivation area, one guard for meteorological station, one person who recorded the water level, two staffs for communication service at day and night, one security for water control tower, one security for water diversion dam, one security for business cleaning house and one person for the guesthouse. The lists of calculation on labour requirement for water diversion dam were three workers for water control gate on the northern part, one person recorded the water level and two staffs for communication service at day and night, one security for water diversion dam, one security for business cleaning house, four workers for opening valve of the water control gate and conservation and preservation for the dam and one cleaner for the compound of water diversion dam.

<sup>1</sup> "စလူရေလှောင်တံခါ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း" (Lists of the calculation on labour force requirement for *Salu* Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019, p. 1

<sup>2</sup> "ရွှေလောင်းရေလှောင်တံခါ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း" (Lists of the calculation on labour force requirement for *Shwelaung* Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019, p. 1

<sup>3</sup> "ပျဉ်ပုံကြီး ရေလှောင်တံခါ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း" (Lists of the calculation on labour force requirement for *Pyinpongyi* Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019, p. 1

<sup>4</sup> "ဘောနီရေလှောင်တံခါ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း" (Lists of the calculation on labour force requirement for *Pyinpongyi* Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019, p. 1

<sup>5</sup> "ကောလိယရေလှောင်တံခါ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း" (Lists of the calculation on labour force requirement for *Bawni* Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019, p. 1

For the irrigation system, thirty-seven workers were appointed for the branch of irrigation canal (I) from the main irrigation canal on the left and seventy workers for the small drains from the branch of the irrigation canal (I), the branch of the irrigation canal (3) and its small drains, the branch of the irrigation canal (4) and its small drains and twelve direct drains in the irrigation season. During the non-irrigation season, eighteen workers for the main irrigation canal and the branch of irrigation canal (I), and thirty-five workers for small drains from the branch of the irrigation canal (I), small drains from the branch of the irrigation canal (3), small drains from the branch of the irrigation canal (4) and 12 direct drains were assigned.<sup>1</sup> Moreover, temporary preservation labours<sup>2</sup> were also appointed in Bago Township according to the requirement of workplace. By the emergency requirement of workplace, one security for emergency water outlet at the sluice gate, two security for a building at the main drain and its branch of irrigation canal (I), one security for the main drain and its branch of irrigation canal (II), one security for the main drain and its branch of irrigation canal (III) and one security for the main drain and its branch of irrigation canal (III) and one security for the main drain and its branch of irrigation canal were to be assigned. Moreover, one security for sluice gate at 12 direct drains were to be appointed according to the emergency requirement of workplace during the raining season.<sup>3</sup>

The lists of calculation on labour requirement for *Ye New* reservoir situated at Kyauktaga Township in Bago District, included nine seasonal labours for preservation season and twenty securities for business cleaning house, guesthouse, gate, store and rainfall station, sanitary workers, the staffs for communication service and one person who recorded the water level were appointed according to the requirement of workplace. The lists of calculation on labour force requirement for water diversion dam and other connected buildings were one guard for water control gate on the left and six security guard for water control gate on the right. In calculating the labour force requirement, one security for business cleaning house, one security for the entrance, one security for store, one person who recorded the rainfall and water level for the water diversion dam, one staff for communication service, one person for operating the generator for electricity and one postal worker were also appointed.<sup>4</sup>

In the irrigation system, twenty-three workers for the branch of irrigation canal (I) and the branch of irrigation canal (II) from the main canal on the left and fifty workers for the small drains from the branch of irrigation canal (I), (II) and (III) were to be appointed for the irrigation season. During the non-irrigation season, one person for the branch of irrigation canal (I) and small drainage (I) from the main canal on the left were to be assigned. Moreover, twenty-five workers for the small drains from the branch of irrigation canal (I), (II) and III were to be appointed. According to the requirement of workplace, six temporary preservation workers for the main canal, one person for the perseveration of small drain from the branch of irrigation canal

---

<sup>1</sup> "ဘိုင်းဒါးရေလှောင်တံခါး လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း" (Lists of the calculation on labour force requirement for Baida Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019, p. 1

<sup>2</sup> Temporary preservation labours mean workers on daily wages for sanitary work regarding the dams and embankment.

<sup>3</sup> လူတွေ့မေးမြန်းခြင်း၊ ဒေါ်နွဲ့နွဲ့စိန်၊ ပုံဆွဲ(၁) (Personal Interview with Daw New New Sein, Drawing Officer (I)), Assistant Director Office, Department of Irrigation and Water Utilization Management, Hlegu Township, on 7 June 2022

<sup>4</sup> ရှမ်းရေလှောင်တံခါး လုပ်သားတွက်ချက်မှုစာရင်း ( Lists of the calculation on labour force requirement for Yenwe reservoir ), Bago Township, Irrigation and Water Utilization and Management Department, 2019, p. 3 ( Hereafter cited as Lists of the calculation on labour force for Yenwe )

(I) and one person for the branch of irrigation canal (I) and (II) were to be assigned.<sup>1</sup> By studying the management of labour force for the respective dam and embankment in Bago District, it can be studied that there were no specification for the irrigation season and non-irrigation season for *Wagatoke* Dam, *Kodukwe* Dam and *Salu* Dam located in Bago Township because of the absence of the irrigated system for the distribution of water during the summer season. Moreover, it can be seen that the appointed number of labour forces differed according to the size of the dam and sluice gate.

The ministry of agriculture and irrigation conducted the assignment of labour for the irrigation works. Moreover, the ministry of agriculture and irrigation opened the Irrigation Technology Centre at Bago Township for the development of technology concerning the irrigation work. In March 1988, the Japanese Government provided to construct this training centre, which was a memorandum of amity and cooperation between the Government of the Union of Myanmar and the Japanese Government. Started from 2005, the refresher course on irrigation technology were started to give training to the government officials and non-gazette government employees at this training centre. Sixteen refresher courses were taught at this training centre.<sup>2</sup> They are Introduction to ID, Administration, A-Code & D-Code, Surveying, Soil Mechanics, Concrete Technology, Hydraulics, Estimation, and Introduction to PC, Specification, Hydrology, Engineering Geology, Construction, Irrigation Practice, and Design Practice and report Writing. After attending this training course, all the employees from the Irrigation Department are allowed to get for their promotion. The duration of training course are defined from one month to two month according to the respective subject.<sup>3</sup> By opening the refresher course at the Irrigation Technology Centre at Bago Township, it led to improve the knowledge about the irrigation technology for the government officials and non-gazette government employees who served at the irrigation department. Moreover, the advanced irrigation technology from other countries can be studied in accordance with the times and benefits of the country will be improved.

### Conclusion and Recommendation

In conclusion, the management and calculation of labor force requirements for dams, lakes, and embankments in Bago District, Myanmar have undergone changes over the years. Before 2006, there was a lack of uniformity in the calculation methods used by different towns in the country. However, since 2006, the Department of Irrigation, Ministry of Agriculture and Irrigation in Yangon has defined a standardized method for calculating the labor force requirements for the entire country.

The calculation of labor force requirements considers various factors, such as the surface area and height of the embankments, distance from dwellings, and the size of the irrigation system. Additionally, the labor force requirements are determined based on the irrigation season,

---

<sup>1</sup> Lists of the calculation on labour force for Yenwe, p. 4

<sup>2</sup> လူတွေ့မေးမြန်းခြင်း၊ ဦးမျိုးတင့်၊ ပုံဆွဲ (၁) (Personal Interview with U Myo Tint, Drawing Officer (I)), Assistant Director Office, Department of Irrigation and Water Utilization Management, Bago Township, on 5 May 2019

<sup>3</sup> လူတွေ့မေးမြန်းခြင်း၊ ဦးစော်မျိုးနိုင်၊ ဦးစီးအရာရှိ (Personal Interview with U Zaw Myo Naing, Chief Officer), Assistant Director Office, Department of Irrigation and Water Utilization Management, Bago Township, on 16 April 2020

which is classified as either irrigation or non-irrigation season, instead of the traditional classification of summer and rainy seasons.

The assignment of labor forces for specific dams and embankments in Bago District varies depending on the size and requirements of each project. The number of workers assigned ranges from a few individuals to larger groups, and additional personnel are appointed for tasks such as security, water control, and recording water levels or rainfall. The labor force requirements for the irrigation systems associated with the dams are also determined based on factors such as canal capacity and length.

The Ministry of Agriculture and Irrigation has taken steps to improve the management of labor force assignments for irrigation works. The establishment of the Irrigation Technology Centre in Bago Township has provided training opportunities for government officials and non-gazette employees to enhance their skills in irrigation technology. This center has offered various refresher courses covering different aspects of irrigation engineering.

The Department of Irrigation, under the Ministry of Agriculture and Irrigation of the Government of the Union of Myanmar, is responsible for conducting irrigation works, including water supply to agricultural lands, water distribution, and flood control management. These tasks involve the construction of dams, embankments, sluice gates, and canals. The Department of Irrigation used a calculation method inherited from the colonial period to determine the labor force requirements for the entire country. To manage the assignment of workers effectively, it is necessary to allocate workers for various tasks related to dams, embankments, water control gates, and summer water supply, as well as for the irrigation system. The number and types of workers required vary based on the size of the dam. Additionally, there are labor costs associated with planting grasslands downstream of the embankments, which may lead to a reduction in such plantations. In Bago Township, dams such as Wagatoke Dam, Kodukwe Dam, and Salu Dam were constructed to prevent flood disasters. Therefore, there was no need for labor force appointments for the irrigation system, as there was no such system in place for water distribution. The Irrigation Department defined two types of seasons for water distribution, namely irrigation season and non-irrigation season, considering the varying rainfall patterns in different areas. The establishment of the Irrigation Technology Centre has facilitated the study of advanced irrigation technology from other countries in accordance with the current time.

It is essential to continue promoting the standardization of labor force calculation methods across the entire country. This will ensure consistency and fairness in the allocation of labor resources for irrigation projects. Second, further training and capacity-building programs should be provided to irrigation officials and employees to enhance their knowledge and skills in irrigation technology. This will contribute to improved management and efficiency in the implementation of irrigation projects. Furthermore, it is important to regularly review and update the labor force requirements and assignment criteria for dams, embankments, and irrigation systems. This should consider factors such as changing weather patterns, technological advancements, and evolving agricultural practices.



### Acknowledgement

First and foremost, the author would like to express appreciation to Rector Dr. Theingi Shwe and Dr. Mi Mi Hlaing (Professor Head), History Department, Hinthada University, for their kind permission to undertake the research. The author also would like to express thanks to Professor Dr. Thin Thin Aye, Professor and Head, History Department, University of Yangon, for her guidance with this research. The author would like to express my deep appreciation to Professor Dr. Khin Myo Win, Professor Of History Department, University of Yangon, who generously provided feedback and constructive suggestions for improving this research.

### References

ကောလိယရေလှောင်တံခံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း (Lists of the calculation on labour force requirement for Kawliya Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019

ကိုဒူကွဲရေလှောင်တံခံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း (Lists of the calculation on labour force requirement for Kodukwe Dam), Bago Township, Irrigation and Water Utilization Management Department, 2019

စလူရေလှောင်တံခံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း (Lists of the calculation on labour force requirement for Salu Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019

ဆည်ကန်တာတမံ ထိန်းသိမ်းခြင်းနှင့် ပတ်သက်၍ အလုပ်သမားစံနှုန်းများ သတ်မှတ်ခြင်း (The calculation of criterion for employees regarding the preservation and conservation of dams and embankments), Yangon, Department of Irrigation, Ministry of agriculture and Irrigation, Government of the Union of Myanmar

ဇလတ်ထော်ရေလှောင်တံခံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း (Lists of the calculation on labour force requirement for Zalattaw Reservoir), Bago Township, Irrigation and Water Utilization and Management Department

ဇောင်းတူရေလှုံဆည်၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း (Lists of the calculation on labour force requirement for Zaungtu sluice gate), Bago Township, Irrigation and Water Utilization and Management Department, 2019

ပျဉ်ပုံကြီးရေလှောင်တံခံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း (Lists of the calculation on labour force requirement for Pyinpongyi Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019

ဘောနီရေလှောင်တံခံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း (Lists of the calculation on labour force requirement for Bawni Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019

ဘိုင်းဒါးရေလှောင်တံခံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း (Lists of the calculation on labour force requirement for Baida Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019

မဇင်းရေလှောင်တံခံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း (Lists of the calculation on labour force requirement for Mazin Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019

ရဲနွယ်ရေလှောင်တံခံ လုပ်သားတွက်ချက်မှုစာရင်း (Lists of the calculation on labour force requirement for Yenwe reservoir ), Bago Township, Irrigation and Water Utilization and Management Department, 2019

ရွှေပြည် (၃)ရေလှောင်တံခံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း (Lists of the calculation on labour force requirement for Shwe pyay (3) Dam), Bago Township, Irrigation and Water Utilization and Management Department

ရွှေလောင်းရေလှောင်တံခံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း (Lists of the calculation on labour force requirement for Shwelaung Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019

ဝါးကတုတ်ရေလှောင်တံ၏ လုပ်သားလိုအပ်ချက် တွက်ချက်မှုစာရင်း၊ (Lists of the calculation on labour force requirement for Wagattoke Dam), Bago Township, Irrigation and Water Utilization Management Department, 2019

အလိုင်နီရေလှောင်တံ၏ လုပ်သားလိုအပ်ချက်တွက်ချက်မှုစာရင်း၊ (Lists of the calculation on labour force requirement for Alainni Dam), Bago Township, Irrigation and Water Utilization and Management Department, 2019

လူတွေ့မေးမြန်းခြင်း၊ ဦးစီးအရာရှိ၊ (Personal Interview with U Zaw Myo Naing, Chief Officer) Assistant Director Office, Department of Irrigation and Water Utilization Management, Bago Township, on 16 April 2020

လူတွေ့မေးမြန်းခြင်း၊ ဒေါ်နွဲ့စိန်၊ ပုံဆွဲ(၁)၊ (Personal Interview with Daw New New Sein, Drawing Officer (I)), Assistant Director Office, Department of Irrigation and Water Utilization Management, Hlegu Township, on 7 June 2022

လူတွေ့မေးမြန်းခြင်း၊ ဦးမျိုးတင့်၊ ပုံဆွဲ(၁)၊ (Personal Interview with U Myo Tint, Drawing Officer (I)), Assistant Director Office, Department of Irrigation and Water Utilization Management, Bago Township, on 5 May 2019 on 7 June 2022

လူတွေ့မေးမြန်းခြင်း၊ ဦးမျိုးတင့်၊ ပုံဆွဲ(၁)၊ (Personal Interview with U Myo Tint, Drawing Officer (I)), Assistant Director Office, Department of Irrigation and Water Utilization Management, Bago Township, on 5 May 2019