

A Geographical Study of Water Resources and Irrigation Works in Monywa District

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Abstract

Monywa District is based on agriculture. Since the climate of Monywa District is a tropical savanna climate, the rainfall is found to be unreliable. In addition to the irregularity of the climate, sometimes drought occurs. Despite irregularity rainfall and drought, it is possible to cultivate in areas where irrigation works are present. Monywa District has a total of 164,633 acres under irrigated cultivation. This acreage accounts for 6.63% of the whole district of 12.80 % of the current occupied area.

Introduction

The increasing population and the scarcity of agricultural land, which, are responsible for an increasing imbalance in the demand and supply of agricultural products, call for alternatives to increase the supply of food and fibers. In this context, the role of irrigation is crucial irrigation is the pre-requisite for the adoption of a new technology in agriculture and for the rapid growth of the agricultural sector.

Irrigation is a basic determinant of agriculture because its inadequacies are the most powerful constraints on the increase of agricultural production, particularly in the dryland farming regions. In traditional agriculture, irrigation was recognized only for its protective role of insurance against the vagaries of rainfall and drought. But with the adoption of high-yielding varieties, chemical fertilization and multiple cropping, the controlled irrigation has become the chief factor in increasing productivity.

Background and Statement of Problem

1. How the different types of irrigational systems that are function within the region.
2. What particular type of irrigation and system has been widely used.

Objectives of the Study

- To understand how much agriculture depends on irrigation.
- To know what particular of irrigational system has been widely used.
- To know the problems and situations of agriculture and irrigation.

Description of the Study Area

The area under study, Monywa District, is administratively situated in Sagaing Division. It is one of the (8) districts in Sagaing Division and it also comprise (8) townships such as. Monywa, Chaung-U, Ayadaw, Budalin, Yinmabin, Salingyi, Kani and Pale Townships. As a geographic grid the area is located between the North Latitudes $21^{\circ} 48'$ to $22^{\circ} 50'$ and the East Longitudes $94^{\circ} 16'$ to $95^{\circ} 39'$. It has a total area of (3,877.1) square miles and it is considerable large in size.

Data Base and Methodology of the Study

Both primary and secondary data are applied in this paper. Secondary data are mainly collected from various departments and offices namely Irrigation Department, Land Records Department and Myanmar Agriculture Service. To make an assessment on these secondary data some types of primary data must be used. Some basic methods are adopted to be applied in this paper.

Analysis and Discussion

In Monywa District there are four ways of cultivation by irrigation. They are as follows:

1. irrigation by government canals and dams,
2. irrigation by private dams,
3. irrigation by pumping river water and
4. irrigation by tube wells

(1) Irrigation by Government Canals and Dams

Prior to 1988, Monywa District obtained irrigation water from the Karbo Dam which was constructed cross the Mu River at Karbo village in the northwest of Shwebo. Ye-U main canal starting from the Karbo Dam reaches Ayadaw Township in Monywa District. This canal is targeted affected of supplying water 8,859 acres but it implemented affected supplies water to about 8,620 acres. Although Kindat right canal is estimated its capacity of 5,850 acres but it actually supplies water to 3,371 acres regularly in Ayadaw Township. In Budain Township this canal is said to be able to irrigate 104,000 acres, but it actually irrigates only 8,170 acres.

In the post 1988, the government constructed Htanzalok Dam in 1996 in Monywa Township. Although this dam is said to irrigate 2,000 acres of paddy land, but it actually irrigates only 500 acres yearly. Thazi Dam was constructed in 1994. Although it has an irrigate area of 1,500 acres of paddy land it is able to irrigate only 895 acres.

In Ayadaw Township, Ayadaw Dam and Iya Dam were constructed during 2005-2006. The Ayadaw Dam is capable of irrigating about 1000 acres and the Iya Dam is capable of irrigating 750 acres.

North Yama Dam was constructed in 1996-97 at Yinmabin Township. Although its irrigatble area is 4,916 acres, it actually irrigates 2,870 acres. In Pale Township, although the irrigable area is 6,619 acres, the actual area under irrigation is 3,505 acres.

In Pale Township, South Yama Dam was constructed in 1999-2000. Although its commanded area is 6,272 acres, it is capable of irrigating only 3,522 acres.

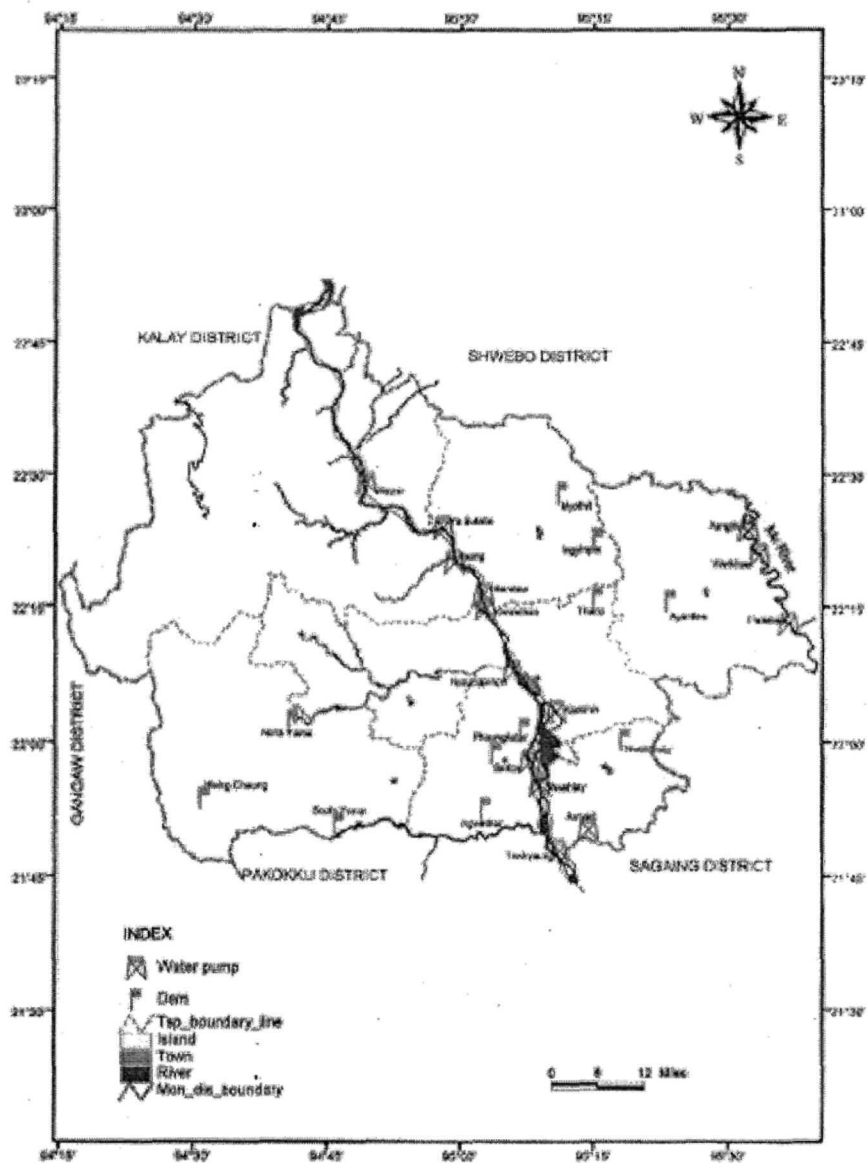
In Chaung-U Township, Nwekhwe Dam was constructed in 1991-92. Its commanded area is 1,229 acres. It is capable of irrigating only 226 acres.

In Budalin Township, Myothit Dam was constructed in 2004-05. It now supplies water to 2,500 acres.

In Salingyi Township, Ngwetha Dam, Foundgadada Dam and Salingyi Dam were constructed in 2004-05. Ngwetha Dam's commanded area is 3,000 acres. But it has the capacity to irrigate only 1,810 acres. Although the commanded area of Foundgadada Dam is 1,500 acres, its actual capacity is to irrigate 538 acres. The commanded area of Salingyi Dam is 1,000 acres. But its actual capacity is to irrigate only 603 acres.

According to the 2009- 2010 data, to state the sown acreage in each township with government irrigation, the net sown acreage by irrigation in Ayadaw Township is 11,991 acres. It accounts for 34.63 % of the net sown irrigated area in Monywa district. It is found to be the largest sown irrigated acreage in the study area. Budalin is the township which is the second largest in sown acreage by irrigation with 8,170 acres. It accounts for 23.59% of the net sown irrigated area. Chaung-U is the township which is smallest in net sown acreage with only 226 acres. The government's canals and dams are shown in Map (1) and Table (1).

Map (1) Station of Dams and Pumping River Water Projects in Monywa District



Source : Water Resource Department and Irrigation Department, Monywa District.

**Table (1) Dam and Canal Irrigation Station in Monywa District
(2009-2010)**

No.	Township	Dam and Canal			
		Name	Targeted Affect Area	Implemented Affected Area	Total Implemented Area
1	Ayadaw	Ayadaw	1,000	0 / 000	11,991
		Iya	750	0 750	
		Kintut canal	5,850	3,371	
		Ye U canal	8,859	8,620	
2	Budalin	Myothit	2,500	0 2500	8,170
		Kintut canal	10,400	8,170	
3	Chaung -U	Nwekhway	1,229	226	226
4	Kani	-	-	-	-
5	Monywa	Htanzaloat	2,000	500	1,395
		Thazi	1,500	895	
6	Pale	North Yama	6,619	3,505	7,027
		South Yama	6,272	3,522	
7	Salingyi	Ngwetha	3,000	1,810	2,951
		Foundgada	1,500	538	
		Salingyi	1,000	603	
8	Yinmabin	North Yama	4,916	2,870	2,870
Total			57,395	34,630	34,630

Source : Irrigation Department and Water Resource Department, Monywa District.

(2) Irrigation by Private Dams

The village people build impounds across nearby streams to store water for irrigation. The stored water is taken to the cultivated fields by digging ditches. The beneficiary villages collected money to build the dams. According to the 2009-2010 data, the well-known private dams in Monywa Township are Bawga Dam, Kyauktalone Dam, Banse Dam, and Kyi-oak Dam. The private dams in Budalin Township are Nyaungkan Dam, Myauk-Kyi Dam, Ywamon Dam, Yehtwet Dam, Shwetaung Dam, Kywehle Dam, Kanmagyi Dam, Shwelaugkan Dam, Letpan (Ashe) Dam, Maunghtaung Dam and Htanpinkan Dam. The private dams in Ayadaw Township are Nyeinzon Dam, Boshwema Dam, U Kyan Dam, Minnemyo Dam, Shwetwinkon Dam, Magyikan Dam, Pegyikhin Dam and Minywa Dam. The private dams in Salingyi Township are Phaungkata Dam, Khuntha Dam, Kywekhotaw Dam, Kangyitaw Dam and Phalankan Dam.

The private dams in Yinmabin Township are Yinpaungtaing Dam, Konywa Dam, Myogi Dam, Ye-aung Dam, Intaw Dam, Sinehlar Dam, Kyunshwewar Dam and Minkangyi Dam. The private dams in Pale Township are Kansalaung Dam, Bese Dam, Chaunggwa Dam, Kahleinchon Dam, Monpin Dam and Hnawkan Dam. The private dams in Kani Township are Konkyl Dam, Tapohn Dam and Yonmaya Dam.

According to the 2009-2010 data, the net sown acreage under private irrigation works in Monywa District is 4,137 acres. To describe the township-wise net sown acreage under private irrigation works, the net sown acreage in Yinmabin Township is 1,185 acres. It accounts for 28.64% of the net sown irrigated area in the district. It is the largest sown acreage in the district. The township which is the second largest in the net sown acreage is Budalin Township with, 1,080 acres. It accounts for 26.10% of the net sown irrigated area in the district. The small net sown acreage is found in Monywa Township with 190 acres. See in Table (2).

Table (2) Station of Private Dam in Monywa District (2009-2010)

No.	Township	Name	Targeted Affected Area	Implemented Affected Area	Total Implemented Area
1	Ayadaw	Nyeinzone	140	50	
		Boshwemar	150	50	
		UKyan	120	20	
		Minnewmyo	250	10	
		Shwetwinkon	250	80	
		Makyikan	187	60	
		Pekyikhinn	165	50	
		Minywa	85	25	345
2	Budalin	Nyaungkan	450	80	
		myakkyi	100	25	
		Ywamon	535	150	
		Ye Htwet	943	300	
		Shwetaung	20	20	
		Kwe Hlay	412	130	
		Kanmakyi	120	50	
		Shwehlaungkan	100	50	
		Letpan (Ashe)	440	100	
		Maungtaung	200	50	
		Htanpinkan	150	50	
		katoewinn	100	25	
		Nhapinyin	150	50	1,080
3	Kani	Konkyi	550	132	
		Tapohn	450	100	
		Yonmaya	350	85	317

4.	Monywa	Bawga	200	100	
		Kyauktalone	100	50	
		Banise	50	20	
		Kyioak	50	20	190
5.	Pale	Kansahlaung	150	75	
		Bese	348	350	
		Chaunggwa	255	100	
		Kahleinchon	75	75	
		Monpin	100	60	
		Hnawkan	110	50	710
6.	Salingyi	Phaungkata	175	175	
		Kyuntha	100	10	
		Kwekhotaw	510	25	
		Kankytaw	100	80	
		Phalankan	30	20	310
7.	Yinmabin	Yinpaungtaing	350	290	
		Konywa	400	250	
		Myogyi	500	250	
		Yeaung	350	185	
		Intaw	100	25	
		Sinehlar	135	35	
		Kyaunshwewar	145	50	
		Minkangyi	200	100	1,185
Total			10,950	4,137	4,137

Source : Irrigation Department and Water Resource Department, Monywa District.

(3) Irrigation by Pumping River-Water

For the development of cultivation by irrigation, the Water Resources Department build irrigation facilities to pump water from the Chindwin river, the Mu river and the Pauk-in chaung by using electric energy and fuel energy. There are 17 water-pumping facilities in Monywa district. The area under irrigation by pumping river-water totals 138,820 acres.

In studying the township-wise cultivation by pumping river-water, apart from Pale Township, there are pumping river-water projects in all townships in Monywa district. Ayadaw Township has the largest sown area under pumping river-water irrigation with 64,000 acres which accounts for 40.10% of the net sown irrigated area in the Monywa district. Yinmabin Township has the smallest sown area of 400 acres under pumping river-water irrigation. It accounts for 0.28% of the net sown irrigated area in Monywa District.

(4) Irrigation by Tube Wells

This type of irrigation includes cultivation with water from nearby drilled tube-wells, by drilling private tube wells and by digging hand-dug wells in the bed of sandy streams.

In studying the cultivation by well irrigation of each township in Monywa district according to the 2009-2010 data, Monywa Township has 96 tube-wells. The cultivated area under by well irrigation is 9,328 acres. It is the largest acreage among the townships in Monywa district. Budalin Township has 26 tube-wells. The cultivated area under well irrigated is 2,523 acres, the second largest acreage in Monywa district. Chaung-U Township has 19 tube-wells. The cultivable area by well irrigation is 553 acres. Salingyi Township has 3 tube-wells and the cultivable area under well irrigation is 224 acres which is the smallest acreage in Monywa district.

Other distinct water resources for irrigation in Monywa District is 99 ponds auto flowing tube wells in Yinmabin Township. Its affected area was 5,142 acres. The river water and underground water stations in Monywa district are shown in Map (1) and Table (3).

**Table (3) Pumping River Water and Underground Water Irrigation
Station in Monywa District (2009-2010)**

No.	Township	Pumping River Water		Underground Water	
		Name	Affected Area	No. of Tube Well	Affected Area
1	Ayadaw	Ayadaw (2)	20,000		
		Ayadaw (3)	40,000		
		Aungtha	200		
		Wetke	200		
2	Budalin	Yebudalin	40,000	26	2,523
		Intaw	10,000		
3	Chaung-U	Tawkaung	450	19	553
		Shwehlay	500		
		Amyit	5,000		
		Makyikhw	5,000		
		Thapanhla	3,000		
4	Kani	Waya	350		
		Itaung	400		
5	Monywa	Koshinkyun	2,820	96	9,328
		Nutkyikyun	500		
6	Salingyi	Nyaungpingyi	10,000	3	224
7	Yinmabin	Sokyin	400	99	5,142
Total			138,820	243	17,770

Source : Irrigation Department and Water Resource Department, Monywa District.

CONCLUSION

Monywa District is situated in the south-western parts of Sagaing Division in the Dry Zone of Central Myanmar. It is located between the North Latitude 21°48' to 22°50' and East Longitude 94°16' to 95°39'. Monywa District is constituted of eight townships. It has an area of (3,877.1) square miles or 24,813,504 acres. Monywa District comprises both hilly areas and plain area.

Irrigation is considered to be one of the most important non-physical determinants. The agricultural activities of the study area depend on not only the natural rainfall but also irrigation water. There are four modes of irrigation systems. These are (1) irrigation by government canals and dams (2) irrigation by private dams (3) irrigation by pumping river water and (4) irrigation by tube wells. When compared to four modes of irrigation systems in the study area taking the water by government canals and dams irrigation system is the most successful mode. According to 2009 to 2010 data, the highest value of irrigation intensity was found at Ayadaw Township. After Ayadaw Township, Budalin, Pale, Salingyi, Yinmabin, Monywa and Chaung-U Township were hierarchically in rank of irrigation intensity.

There are 12 government dams and three main canals in Monywa District. In the whole district, there are also 47 private dams and 17 water pumping facilities.

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ကျမ်းကိုးစာရင်း

- ရေအရင်းအမြစ်အသုံးချရေးဦးစီးဌာန (၂၀၀၁) : မုံရွာခရိုင်ရေအရင်းအမြစ်အသုံးချရေး ဦးစီးဌာန၏ လျှပ်စစ်ဓါတ်အားသုံး မြေအောက်ရေဖြင့် စိုက်ပျိုးရေးလုပ်ငန်း အစီရင်ခံစာ
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