Recovery Bulletin 1 | 25 January 2016
National Natural Disaster Management Committee
Republic of the Union of Myanmar

This bulletin was prepared jointly by the Government of Myanmar and the UN System. The period covered by this report is 1 October 2015 - 25 January 2016.

A. Headlines

Construction of resilient housing in Chin State; 1,603 houses there have been completed.

- The Government of Myanmar has implemented MMK 17.3 billion (USD 13.4 million) of recovery activities.
- As part of its early recovery activities, the Government of Myanmar has so far reconstructed 3,907 houses, 426 schools, 314 road sections, 299 bridges, 120 dams and dykes and 550 wells.
- The third Recovery Forum was held in Naypyidaw on 11 December 2015; the Post-Disaster Needs Assessment of Floods and Landslides was also launched at this meeting.
- A draft Recovery Plan and Multi-Sector Recovery Framework was presented at the Recovery Coordination Meeting on 18 January 2016.

Headline Figures, December 2015 – data from MoSWRR 2015, MOAI 2015, IHLCA 2010

State/Region	Poverty Incidence	People displaced by floods	Totally Damaged houses	Destroyed Farmland (hectares)	Share of Relief expenditures	% of total disaster impact*
Ayeyarwaddy	0.322	498,759	1,251	209,971	23.97%	10.05%
Bago	0.183	177,315	281	152,847	13.00%	4.90%
Chin	0.733	17,924	2,951	7,867	4.41%	25.14%
Kachin	0.266	7,454	69	12,791	1.03%	0.78%
Kayin	0.174	7,714	1	106	9.90%	0.20%
Magway	0.270	303,694	414	65,858	8.41%	8.01%
Mandalay	0.266	18,977	256	27	1.47%	0.98%
Mon	0.163	6,632	45	-	0.89%	0.10%
Rakhine	0.435	109,707	14,130	217,246	14.75%	35.25%
Sagaing	0.151	473,365	1,982	121,409	7.89%	11.32%
Shan	0.270	5,329	128	2,863	11.41%	1.12%
Yangon	0.161	63,576	-	56,486	2.85%	2.16%
Total		**1,690,446**	**21,508**	**847,471**	**100.00%**	**100.00%**

*Calculated based on damage to housing, direct economic losses and GDP per capia

B. Key Messages

Vice-President U Nyan Tun delivers the opening remarks at the third Recovery Forum

The third Recovery Forum was held in Naypyidaw on the 11 December. It was opened by Vice President U Nyan Tun, who stated that the Post-Disaster Needs Assessment was "aimed at systematically assessing the recovery of about two million people who were affected [displaced] by the disaster." The Vice President also praised the coordination and cooperation demonstrated during the emergency response phase, in particular, the information management and early warning and evacuation functions. He also stressed that resource-and-information sharing, coordination, transparency and accountability must continue into the recovery phase.

Other speakers included Dr. U Myint, Chief Economic Advisor to the President; Dr. Yin Yin Nwe, Education Advisor to the President; Dr. Zaw Oo, Presidential Advisor on Recovery; U Kyaw Lwin, Minister of Construction; U Kyaw Lin, Permanent Secretary of the Ministry of Construction; U Soe Aung, Permanent Secretary of the Ministry of Social Welfare, Relief and Resettlement; and representatives from the World Bank, the EU, JICA and the UN system.

Key issues discussed include the need for an inclusive, resilient recovery process; strong inter-sectoral and inter-institutional coordination; harmonisation of national priorities with those of development partners; the need to align recovery interventions with long-term development and the drafting of contextualised, region-specific plans. Key findings from the Post-Disaster Needs Assessment of the Floods and Landslides was also presented and feedback sought from the private sector and development partners.

A Recovery Coordination Meeting was hosted by the Ministry of Construction on 18 January 2016 where the draft Recovery plan and Recovery framework was presented. Key speakers included U Kyaw Lwin, Minister of Construction; U Kyaw Lin, Permanent Secretary of the Ministry of Construction; Dr. Zaw Oo, who moderated the discussion on the draft plan and framework; and Messrs. Stean Tshiband and Sean Ng from the United Nations Development Programme. Details of the draft plan are discussed below.

C. Situation Overview

As of the 6 December 2015, the NNDMC reports that 1,690,446 people were displaced by flooding and landslides and 172 people have died; the Post-Floods-and-Landslides Needs Assessment (PFLNA) additionally reported that at least 5.4 million people have been adversely-impacted (this includes persons who have been displaced, injured, had their livelihoods or normal daily routine disrupted in both the short-term and long-term, lost assets/capital or have died due to the floods). 21,508 houses have been totally damaged (destroyed) by the flooding (though should be noted that the figures from Ayeyarwaddy Region

are still being re-assessed) and 847,471 hectares of farmland has been destroyed. Recovery activities are well underway: the Government of Myanmar has so far reconstructed and rehabilitated 3,907 houses, 426 schools, 314 road sections, 299 bridges, 120 dams and dykes and 550 wells. State and region governments have also raised a total of MMK 16.4 billion (USD 12.6 million) in cash and Gifts-in-Kind for response and recovery activities.

Affected areas have reported MMK 1.93 trillion (USD 1.49 billion) – or 3.7% of GDP in damage and losses – the heaviest concentrations of which are in Rakhine and Chin States. Whilst not entirely indicative of the priorities of affected persons, the table below was a useful reference point for the allocation of recovery resources.

Summary of Damage and Losses in million kyats – reproduced from the Post-Floods-and-Landslides Needs Assessment (PFLNA)

Sector/Sub-Sector	Damage	Losses	Total Disaster Effects	% of Total [desc.]
Housing	508,079.30	34,153.50	542,232.80	28.14%
Agriculture (crops)	54,252.60	335,210.10	389,462.70	20.21%
Industry	27,585.70	300,191.10	327,776.80	17.01%
Fisheries	299.40	305,677.40	305,976.80	15.88%
Commerce	27,723.90	125,307.80	153,031.70	7.94%
Transport	76,175.10	8,512.60	84,687.70	4.39%
Education	48,468.90	2,302.60	50,771.50	2.63%
Disaster Risk Management	27.20	23,674.40	23,701.60	1.23%
Water and Sanitation	14,805.50	936.70	15,742.20	0.82%
Water Resource Management	13,271.10	--	14,271.10	0.74%
Health	6,647.90	1,537.30	8,185.20	0.42%
Electricity	6,282.30	623.70	6,906.00	0.36%
Communications	1,246.80	1,244.00	2,490.80	0.13%
Livestock	7,627.40	10,150.50	1,777.90	0.09%
Total	792,493.10	1,149,521.70	1,927,014.80	100.00%

In response these effects, the Government of Myanmar has so far implemented MMK 17.3 billion (USD13.4 million) of early recovery activities – addition to the MMK 28.2 billion (USD 22.2 million) in relief expenditures, with the largest share of recovery expenditures being realised by the Ministry of Construction (29.54%), the Ministry of Social Welfare (27.86%) and the Ministry of Education (25.12%). However, these completed interventions constitute only a small percentage of the proposed recovery budget, which was unveiled at the Recovery Coordination Meeting on 18 January and seeks to be in alignment with the damages and losses identified by the PFLNA:

Draft Sector Budget in million kyats – adapted from the PFLNA by the MoC and UNDP

Sector/Sub-Sector	Budget	% of Total	Involved Ministries/Agencies
Housing	632,542	27.33%	MoC, MoECaF, MoFinance
Agriculture and Livestock	534,563	23.09%	MoAI, MADB, MLFRD, MoLabour, MoTransport, MoSWRR
Industry, Commerce and Finance	341,563	14.76%	MoF, MoCoop, MoLabour, MADB, MoSWRR
Cash and short-term livelihoods	223,919	9.67%	MoSWRR, MLFRD
Transportation Infrastructure	149,763	6.47%	MoC, MLFRD, MoRailways
Information and Communication Technology	106,318	4.59%	MoCIT
Education	95,254	4.12%	MoEdu
Environmental Protection	64,500	2.79%	MoECaF
Fisheries	63,069	2.72%	MLFRD
Disaster Risk Management	32,810	1.42%	MoSWRR, MoC, MoFinance, MoTransport
Health	31,840	1.38%	MoH
Water and Sanitation	25,623	1.11%	MLFRD, MoH
Electricity	6,864	0.30%	MoElectricPower
Protection and Accountability	6,000	0.26%	MoSWRR, MoCIT
Total	**2,314,627**	**100%**	

This and the following Recovery bulletins will seek to monitor and report on both the changing context and the progress and impact of government interventions, in line with the principles recovery planning – namely, the effective application of technical expertise; accountability and transparency to affected communities; and programme quality and efficient use of public monies – presented by the Permanent Secretary of the Ministry of Construction at the Recovery Coordination Meeting on 18 January 2016.

The proposed MMK 2.31 trillion budget is intended to offset the direct damage and losses from the floods and landslides as the MMK 1.93 trillion figure in damages and losses estimated by the PFLNA represents only the direct damages and losses from the disaster. The RCC is currently seeking feedback from the various line ministries and state and region governments on the proposed plan.

The accumulation of long-term indirect losses is far harder to quantify for floods than for cyclones but experience from other disaster-prone countries such as the Philippines and China is that these negative effects compound over time and result in "missing" income growth. Macroeconomic indicators – GDP growth for the Union is still expected to hold strong at 8.3% – are likely to mask the extent of adverse impacts on poor townships and households as they do not represent a significant proportion of economic activity.

The primary effects of the floods – loss of income, loss of access to services, loss of assets and displacement – are deeply tied into the pre-existing limiting factors and barriers to inclusive growth and human development. These have already been largely identified by the World Bank in their Country Diagnostic and form an important lens through which progress in recovery should be interpreted:

- -Poor transport connectivity
- -Low rates of electrification
- -Lack of access to agricultural extension services and poor production practices
- -Lack of diversification in agricultural income sources
- -Insufficient irrigation and WASH infrastructure
- -Limited supply of skilled labour and poor productivity
- -Weak financial sector
- -Underinvestment and lack of outcome monitoring in social services, in particular, healthcare and education
- -Lack of access to agricultural land and insecurity of tenure
- -Weak tax compliance and narrow tax base

C1. Demography and Household Vulnerability

To mitigate the adoption of negative coping mechanisms, the Ministry of Social Welfare, Relief and Resettlement has begun surveying households with vulnerable persons across the most-affected states and regions: currently, a total of 34,162 households have elderly persons, 6,860 have pregnant women, 61,494 have children under 5 and 3,250 households have members with mental or physical disabilities. These households will be prioritised for social protection and support, including the provision of cash grants, case management and follow-up and monitoring from community structures.

Though previously published in NNDMC Sitrep 4 on September 2 2015, the list of the top 40 most-affected townships has been recalculated using updated Census information as well as new damage and loss data. There have been relatively few changes. Damages and humanitarian need are still overwhelmingly concentrated in Rakhine and Chin States.

Most Severely-Affected Townships – data from the 2014 Census, MOSWRR and MNPED

Rakhine	Chin	Sagaing	Ayeyarwaddy	Magway	Bago	Yangon
Buthidaung	Tedim	Kale	Ingapu	Pwintbyu	Monyo	Taikkyi
Ann	Paletwa	Tamu	Hinthada	Sidoktaya	Thayarwaddy	
Maungdaw	Mindat	Kalewa	Kyaunggon	Gangaw	Letpadan	
Mrauk-U	Hakha	Kawlin	Yegyi	Ngape	Padaung	
Minbya	Tonzang	Homalin	Zalun			
Ponnagyun	Falam		Nyaungdon			
Rathedaung	Kanpetlet					
Minbya	Matupi					
Pauktaw	Thantlang					
Kyauktaw						
Sittwe						
Kyaukpyu						

The prioritisation which occurs in the table above ranks townships, by considering shelter damage, direct economic losses and poverty (GDP per capita) in an unweighted index; darker colours indicate a higher ranking and a higher share of the damage and losses. Collectively, this group of 40 townships (less than a fifth of the 218 affected across the country), represents 93% of totally damaged houses, 77% of direct economic losses and 80% of totally damaged schools, but only 8% of the total population of all affected townships. These townships may be further differentiated into areas which have:

a) High intensity of damage: these include Hakha, Ponnagyun, Rathedaung, Minbya, Tedim, Mindat and Pauktaw. These areas have extremely high losses per capita and a far larger proportion of their housing stock has been destroyed. Greater intensity of damage usually necessitates higher per capita recovery spending; household-level recovery is also much more difficult when a greater proportion of one's surrounding community has been severely-impacted.

b) Widespread damage: these include Taikkyi, Maungdaw and Ingapu. Whilst per capita losses are comparatively lower, the sheer number of affected persons, destroyed farmland and damaged housing in these areas mean that recovery there requires large-scale interventions aimed at large numbers of beneficiaries.

c) A combination of both: Buthidaung, Ann, Mrauk-U, Pwintbyu and Kale have suffered both intensive and extensive damage. These areas will require the greatest care in planning and implementation as the combination of intensity and severity has likely significantly eroded local capacity to recover, presenting the greatest challenges to successful recovery.

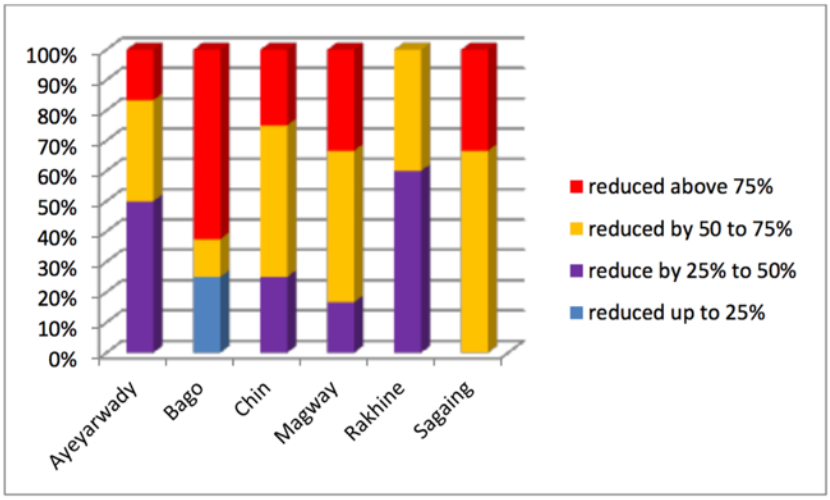
According GDP data from 2015, 12 of the 40 are are in the poorest quintile of townships, 7 of which are in the poorest 10% and have less than USD 360 in GDP per capita; of extreme interest are Tedim (USD 194 per annum), Paletwa (USD 208) and Maungdaw (USD 227). Chin's low income per capita is further explained by its age dependency ratio: Paletwa, Tedim, Matupi, Thantlang, Tonzang, Mindat and Kanpetlet all have rates above 80%, meaning that there are less than 5 persons of working age for every 4 dependents. Phrased differently, for every dollar wages are raised in these areas, per capita incomes increase by less than 20 cents. In light of these demographic challenges, poverty reduction is likely to occur only if labour productivity gains are paired with robust increases in social spending.

C2. Agriculture and Food Security

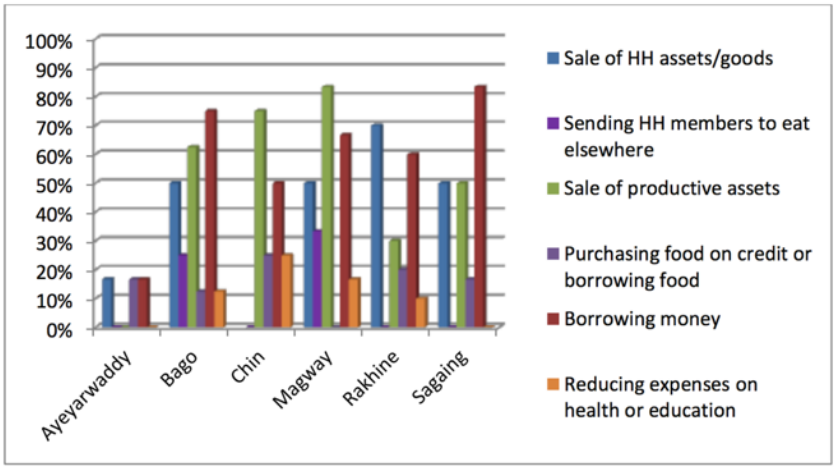
847,741 hectares of farmland, out of a total of 1,115,339 hectares that were inundated across the country, have been destroyed. According to the PFLNA, the agriculture sector experienced the heaviest flood-related losses in workdays, losing 7.2 million workdays out of the Union-wide total of 9.4 million. This amounts to approximately MMK 14.6 billion in lost personal income. Additionally, the loss of casual

agricultural jobs – the most important income source for poor households – formed the majority of the lost agricultural workdays. The Asian Development Bank has allocated approximately USD 10 million in grants to restore and rehabilitate livelihoods in Chin State, one of the most affected areas.

Below is a chart detailing expected reductions in agricultural yield from the Ministry of Agriculture and Irrigation and the Ministry of Livestock, Fisheries and Rural Development's joint assessment with humanitarian and development partners across some of the most affected areas in Ayeyarwaddy, Bago, Chin, Magway, Rakhine and Sagaing. With the exception of some parts of Bago and Rakhine expected reductions in yield are almost uniformly above 50%.



It was projected that the impacts of the disaster on agriculture would persist until the start of the new monsoon in May/June 2016, worsening the outlook for poor households who are largely reliant on casual agricultural labour. Correspondingly, MOAI and MLFRD's assessment also recorded an increase in the employ of negative coping mechanisms: the chart below details the percentage of villages in each assessed area reporting increases in livelihood-based coping mechanisms. The sale of productive assets and borrowing money, though necessary for poor households to meet their short-term consumption needs, are expected to have long-lasting impact on a household's capacity to recover.



It was also reported that Chin State saw a marked increase in the use of food-based coping mechanisms, including relying on less expensive foods, reducing the number of meals and reducing portion sizes whereas the majority of villages in Chin said that had not resorted to such measures prior to the disaster.

The damage and losses from the Agriculture, Fisheries and Livestock sectors amounted to MMK 709.7 billion or 36.83% of all the effects of the disaster; the agriculture sector's losses alone were larger than every other sector except housing.

The World Bank and LIFT found that average wet season rice yields per hectare in 2013 were 2.4 tons in Sagaing, 2.8 in Ayeyarwaddy and 3.0 in Bago, indicating large yield gap between Myanmar other areas in the region such as central Thailand, where the average yield per hectare for conventional varieties was 3.8 tons and the Mekong Delta region in Vietnam where yields were between 6 and 7.5 tons per hectare. This yield gap, the World Bank points out, is one of the main results of low agricultural productivity in Myanmar.

Flood damage and lost farming are likely to combine with the pre-existing restraints of inefficient and poor milling technology and processes, poor access to tenure and agricultural land, insufficient irrigation infrastructure and a lack of agricultural extension services, resulting in even lower agricultural productivity.

In addition to the abovementioned reasons, the fact that – according to the PFLNA – 65% of all agricultural workers are casual labourers makes the simple restoration of pre-disaster conditions not entirely desirable. Casual labourers have one of the most insecure forms of livelihoods and the least access to social protection. And if agricultural work in Myanmar generally offers few pathways out of poverty, this is especially true for casual labourers.

C3. Economic Development and Access to Basic Infrastructure

The Government of Myanmar has completed MMK 17.3 billion (USD 13.4 million) of early recovery activities. Primarily implemented by the Ministry of Construction, Ministry of Cooperatives, Ministry of Education, Ministry of Health, Ministry of Social Welfare, Relief and Resettlement and the Ministry of Industry, completed activities include Cash for Work interventions and other types of livelihood assistance as well as infrastructure repair and rehabilitation. The Asian Development Bank has also allocated USD 30 million in grants to bridge rehabilitation across the affected areas. Other development partners have been undertaking cash-for-work and other cash-based activities – the UNDP has reached 1,126 vulnerable persons in Chin and Rakhine States and will expand their activities to cover an additional 5,343.

Representatives from UMFCCI, UNDP and OCHA at a health centre in Tacloban City reconstructed by the Philippine Disaster Recovery Foundation

Recognising the key role that private sector development has in inclusive, sustainable growth, the Union of Myanmar Federation of Chambers of Commerce and Industry (UMFCCI) went on an exposure mission to the Philippines jointly coordinated by UNDP and UN OCHA from 8-11 December 2015. The mission aimed to understand the role the Philippine Disaster Recovery Foundation (PDRF) – formed of private sector actors – played in post-Haiyan recovery and resilience building and build public-private partnerships.

The exposure mission visited leading PDRF members in Manila as well as surveyed PDRF work in Leyte Province, where Haiyan made landfall. Lessons learnt and action points from the exposure meeting included the need for UMFCCI to facilitate private-sector involvement in recovery in a coordinated manner, the need to jointly implement activities alongside the government and affected communities, the need to develop an integrated approach for humanitarian response and recovery financing as well as public-private partnerships and the need for research to identify capacities and challenges in involving the private sector in recovery. UMFCCI will also be included in UNDP capacity building measures on the Minimum Economic Recovery Standards. UMFCCI and the UNDP Myanmar will continue to collaborate their counterparts in the Philippines to support a stronger role for the private sector in recovery.

Across the affected townships, there is a positive, statistically significant correlation between GDP per capita and electrification: GDP per capita increased by USD 2.37 (± USD 1.11) for every 1% increase in the proportion of the population which had access to electricity. Though there was also a positive correlation between having a primary school education and GDP per capita – for every additional one percent of the population which has a primary school education, GDP per capita increases by USD 7.68 (± USD 1.47) – this relationship is absent at the middle school and high school levels. This indicates that the lack of investment in electrification – and access to other basic services, such as healthcare – begins limiting the effectiveness of education investments beyond the primary school level. It must also be noted that whilst these trends hold true for townships as a whole, to apply them at a household or personal level would be incorrect.

Due to the complex nature of poverty, limiting factors to development will continue to be explored in greater depth and geographic specificity in subsequent bulletins.

Whilst it is still too early to observe any post-floods shift in income, it is possible to identify the areas in which long-term economic development will be severely hampered. Unsurprisingly, townships in Chin State are clustered at the top end of the scale. Tedim was once again an extreme outlier, recording losses worth 32.66% of its GDP; Chin State as a whole posted losses amounting to a staggering 14.24% of its GDP. In contrast, Rakhine, which had the second highest proportion of losses to GDP, had a ratio of 2.28% as it experienced less damage to infrastructure than the landslide-affected Chin State,

Townships with the highest of proportion of Direct Economic Losses to GDP – data from MOSWRR and MNPED

Chin	Rakhine	Magway	Sagaing	Ayeyarwaddy	Yangon	Bago	Shan	Mandalay
Tedim	Ann	Pwintbyu	Tamu	Ingapu	Taikkyi	Letpadan	Mongmit	Thabeikkyin
Mindat	Ponnagyun	Sidoktaya	Kalewa	Danubyu	Htantabin	Minhla	Tachileik	
Hakha	Minbya	Gangaw	Kale	Kyaunggon		Monyo		
Kanpetlet	Mrauk-U	Ngape	Kawlin	Myanaung		Thayarwady		
Tonzang	Kyaukpyu	Thayet	Kanbalu					
Falam	Kyauktaw							
Paletwa	Buthidaung							
Matupi	Pauktaw							
Thantlang								

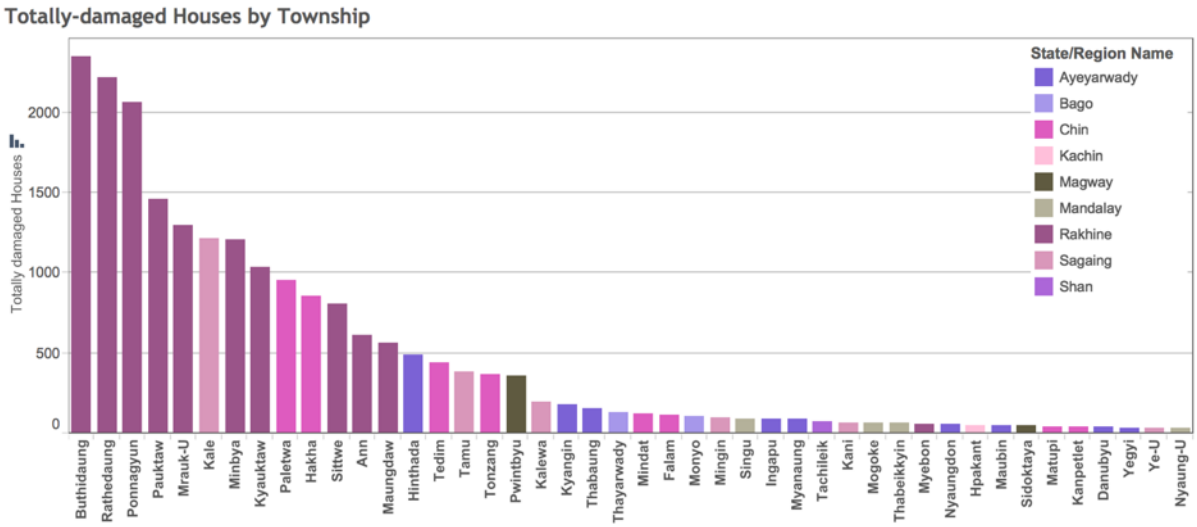
Large-scale, labour-intensive programmes and the development of job platforms were identified by the PFLNA as important short-term measures to improve food insecurity and livelihoods. In the medium-to-long-term, the development of high-volume vocational training programmes to build skills in carpentry, masonry and ironworking were proposed so that casual labourers with relatively low levels of education may take advantage of the anticipated increases in construction and infrastructure works. And, as can be seen from the table on the next page, persons in unremunerated, seasonal or insecure jobs are very prevalent in almost all of the affected states and regions.

Livelihood Indicators, various – data from 2014 Census, IHLCA 2010 and MOAI 2015

State/Region	Poverty Incidence	Dependency ratio (total)	% workers, own account workers	% workers, unpaid family labour	% workers, household workers	Destroyed Farmland (hectares)
Ayeyarwaddy	0.322	54.28%	19.64%	7.57%	21.12%	209,971
Bago	0.183	53.29%	18.46%	7.00%	22.67%	152,847
Chin	0.733	80.95%	17.84%	22.96%	14.20%	7,867
Kachin	0.266	49.90%	25.75%	7.99%	16.48%	12,791
Kayin	0.174	69.28%	22.07%	9.59%	20.80%	106
Magway	0.270	51.89%	23.69%	13.86%	15.96%	65,858
Mandalay	0.266	49.58%	21.49%	8.73%	18.01%	27
Mon	0.163	59.91%	17.21%	4.81%	22.12%	0
Rakhine	0.435	60.76%	19.66%	7.53%	23.12%	217,246
Sagaing	0.151	53.52%	25.71%	13.94%	15.06%	121,409
Shan	0.270	54.66%	29.34%	19.71%	11.27%	2,863
Yangon	0.161	46.12%	15.29%	4.69%	20.55%	56,486

As an additional note, Kayin and Shan are home to extremely low rates of educational attainment; in particular, Mongkhet, Matman, Tangyan, Monyawng and Mongping all have populations where more than 80% of persons above 25 do not have any education attainment. However, as Kayin and Shan together represent less than 2% of the overall damage from the flooding, it is suggested that development actors explore their issues in greater depth as these two states are likely to be precluded from any major recovery interventions.

C4. Shelter



The damages caused by the recent flooding to housing were the largest of any sector. However, as can be seen from the chart above, this damage was not uniformly distributed: the majority of totally-damaged houses are concentrated primarily in Rakhine and Chin. Responsibility for the reconstruction of houses has been divided between the Ministries of Construction, Environmental Protection and Forestry and Electric Power. In addition to the (re)construction of safe shelters, involved ministries will also need to undertake the necessary site development measures and in some cases, community preparation for resettlement – the most notable example of this being the relocation of Hakha town.

There has been much progress in the reconstruction of houses, a total of 3,907 houses have been completed, including 1,603 out of the 2,951 planned for Chin State (54% completed), 1,188 out of 2,447 in Ayeyarwaddy (49% completed), 847 out of 1,972 in Sagaing (43% completed) and 269 out out 269 planned houses in Bago (100% completed). Additionally, the Rakhine State government has secured funding from private donors for the reconstruction of 13,392 houses there. Additionally, the donation of zinc sheeting

from the Chinese government has been allocated amongst the most-affected states and regions, with Rakhine receiving 60,000 sheets, Ayeyarwaddy receiving 20,000, Sagaing receiving 20,000 and Magway receiving 16,668 sheets.

The majority of affected areas hover around the average rates of access to improved drinking water sources, safe sanitation and electricity (34.53%, 29.54% and 26.64% respectively) except for Rakhine State. The poor access to services there will likely make the construction of durable, disaster-resilient shelter a lengthier, costlier and more complicated endeavour than in other locations.

Summary of Living Conditions – data from the 2014 Census and MoSWRR

State/Region	% of HHDs WITHOUT improved drinking water source	% of HHDs WITHOUT safe sanitation	% of HHDs WITHOUT Electricity	Totally Damaged houses	% of total # of damaged houses
Ayeryawaddy	46.32%	25.43%	86.43%	1,251	5.8%
Bago	26.36%	25.34%	72.34%	281	1.3%
Chin	29.97%	25.44%	84.69%	2,951	13.7%
Kachin	18.45%	12.74%	68.78%	69	0.3%
Kayin	31.34%	31.09%	70.92%	1	0.0%
Magway	23.14%	31.57%	77.39%	414	1.9%
Mandalay	22.66%	27.30%	65.92%	256	1.2%
Mon	31.44%	20.93%	59.04%	45	0.2%
Rakhine	72.18%	76.70%	90.52%	14,130	65.7%
Sagaing	18.79%	28.43%	75.83%	1,982	9.2%
Shan	42.27%	30.23%	64.14%	128	0.6%
Yangon	37.83%	13.31%	49.30%	-	0.0%

It should be noted that the Shelter sector's share of the total damage and losses may dip in light of the recent review of the number of totally-damaged houses reported in Ayeyarwaddy.

C5. Transportation

Of the 1,012 road sections currently planned for repair and reconstruction, 314 have been completed: 129 in Chin State, 78 in Sagaing, 63 in Rakhine, 37 in Ayeyarwaddy and 7 in Bago. Additionally, 299 bridges have also been completed across the affected areas and the repair/reconstruction of an additional 533 bridges are planned or are ongoing. However, the restoration of damaged roads and bridges is only one part of the larger recovery and reconstruction plans which will seek to improve access across the affected areas.

The road network density of Myanmar is 5.6 km per 100 km2, ranking 86th out of the 90 countries for which data exists in the World Bank's Development Indicators. In comparison to other countries in the region with similar population densities, Myanmar's standing is unfavourable: Brunei's road density is 54.2 km/100km2, Malaysia's is 47 km and Cambodia (the only country in ASEAN poorer than Myanmar) has 21.9 km/100km2.

The transport sector and road access in Chin and Rakhine States have been identified as critical to recovery efforts by their respective state governments and key construction efforts include the Kale-Falam-Hakha-Gangaw Corridor, which will reach some of the poorest and most-severely-affected areas and link Chin State to Tamu and India, as well as the Minbu-Ann and the Ngathaichaung-Gwa road construction projects.

However, in reference to the table on the next page, the Union-wide needs for road network development are much more diffuse: though the Kale-Falam-Hakha-Gangaw Corridor will span both Sagaing and Chin, the number of people it will service in each state will be quite different. Each kilometre of road in Sagaing currently accommodates 1,157 people, as opposed to 243 in Chin. The extreme poverty of Chin State does, however, add some urgency to the need for infrastructure investment there.

Summary Indicators on Access, Damage and Poverty – data from the 2014 Census, MoC 2014 , MoSWRR 2015 and IHLCA 2010					
State/Region	**Population Density (ppl/km2) [desc.]**	**Residents per km of road**	**Road density (Km of Road per 100 km2)**	**Direct Economic Losses in million Kyat**	**Poverty Incidence**
Yangon	586	5,777	10.042	11,413.42	0.161
Mandalay	194	2,647	5.732	1,040.85	0.266
Mon	172	2,886	6.03	0.00	0.163
Ayeryawaddy	176	2,480	7.248	24,319.59	0.322
Bago	123	2,212	5.555	13,183.84	0.183
Rakhine	88	1,769	4.956	44,981.29	0.435
Magway	91	1,163	7.851	37,018.52	0.270
Sagaing	54	1,157	4.793	35,520.74	0.151
Kayin	47	777	6.069	408.44	0.174
Shan	29	409	7.045	2,870.44	0.270
Kachin	16	387	4.186	1,370.70	0.266
Chin	13	241	5.475	28,221.17	0.733

The transport situation in Rakhine is slightly more straightforward: though it sits firmly in the middle of the pack in terms of road network and population density, the massive economic losses there make the restoration of access and infrastructure a clear priority for recovery programmes. In contrast, Yangon – which has less than 3% of the total disaster impact – has the poorest ratio of population density to road network density; undertaking road improvements there would benefit the greatest number of people but would also further concentrate economic growth there.

The link between investment in transport infrastructure and increases in economic growth and productivity is well-supported by empirical evidence; additionally, the IMF has demonstrated that both the quantity and quality of infrastructure are important factors for the reduction of income inequality. Applying this to the current situation, the proposed transportation investments seem to be aimed at redressing inequality. However, further clarification on the long-term road network density targets for each state and region are still needed as the pursuit of a redistributive allocation of infrastructure funds will ultimately prioritise sparsely-populated areas over denser ones where the needs, though different, are nevertheless still dire.

C6. Education

The Ministry of Education has achieved MMK 4.37 billion (USD 3.6 million) of activities in order to restore affected children's access to education, including cleaning and repair of damaged facilities. Contributing to the successful implementation of the Government of Myanmar's free basic education initiative, the Ministry of Education has also purchased and distributed textbooks, stationery, school uniforms and other other learning supplies. Additionally, 426 schools have been repaired/rehabilitated so far, of which 292 were in Rakhine, 46 in Sagaing, 45 in Ayeyarwaddy, 19 in Magway, 16 in Chin and 8 in Bago. The Ministry of Education is also supporting nutrition programmes in schools. Humanitarian partners have provided learning supplies, recreation kits, school tents and rehabilitated existing temporary learning spaces.

The 26 townships in the table on the next page represents 85% or 804 out of the 948 schools which were destroyed in the flooding. Additionally, townships which are also in the top 40 most-affected have been highlighted in bold. Though the reconstruction of damaged and destroyed schools is a clear priority, it is apparent from the table below that the rehabilitation of physical structures is far from the only issue limiting access to education.

Only 25% of the 218 flood-affected townships have more than 70% of children attending schools. Worryingly, a similar proportion of townships have more than 10% of children who have never attended school; the most extreme cases are in Shan State, with only 24.8% of children in Mongkhet having ever

attended school. Alone, the rehabilitation of all flood-affected education infrastructure would, at most, restore access for the approximately 67% of children in these areas who attend school. There is also a striking overlap between the townships which have the highest rates of children never having attended school and those with the highest proportion of residents without any type of identification document.

Education Indicators, various – data from the 2014 Census and MoE 2015

State/ Region	Township	% of population 5-17 Attending School	% of population 5-17 NOT Attending School	% of population 5-17 NEVER Attended School	Destroyed schools [desc.]
Rakhine	**Buthidaung**	60.2	17.9	21.9	143
Rakhine	**Maungdaw**	53.6	17.6	28.8	87
Rakhine	**Mrauk-U**	62.4	26.8	10.8	83
Ayeyarwady	Thabaung	66.6	25.5	7.9	75
Rakhine	**Minbya**	62.9	25.0	12.2	69
Rakhine	**Kyauktaw**	67.5	23.1	9.4	60
Rakhine	**Ponnagyun**	66.9	23.6	9.5	47
Rakhine	**Rathedaung**	68.8	21.7	9.5	39
Rakhine	**Pauktaw**	58.6	29.4	12.1	37
Bago	**Letpadan**	63.5	28.3	8.2	19
Rakhine	**Ann**	68.0	18.4	13.7	17
Sagaing	**Kale**	72.2	20.9	6.9	17
Rakhine	**Sittwe**	61.8	26.2	12	15
Chin	**Paletwa**	73.7	9.3	17.1	12
Chin	**Matupi**	83.8	5.8	10.4	12
Yangon	**Taikkyi**	62.0	29.4	8.7	11
Magway	**Sidoktaya**	70.7	22.8	6.4	11
Chin	**Hakha**	82.2	11.1	6.7	11
Bago	Minhla	62.4	30.7	7	9
Ayeyarwady	**Yegyi**	64.1	28.6	7.2	8
Chin	**Tonzang**	75.5	14.2	10.3	8
Magway	Aunglan	58.2	33.8	7.9	7
Chin	**Tedim**	77.3	14.1	8.6	7

Barriers which cause children to stop attending school have been well-documented and mostly revolve around economic concerns; though primary, middle and high school are free, households typically face other challenges such as transportation costs and the need for additional farm labour. Furthermore, affected households in Bago, Chin, Magway and Rakhine all reported reducing health and education expenditures in response to income and food security constraints caused by the flooding. The actual rates of non-attendance are likely to have increased from the pre-disaster rates documented above.

Finally, to round out the findings on the relationship between education and income discussed above in section C3, the World Bank notes that although enrolment rates in Myanmar are respectable, “completion rates indicate a significant problem and quality has been poor”: 25% of a children starting grade 1 leave after primary school and only 11% of them graduate from high school. Though these are not strictly issues related to the disaster impact, a lack of education is likely to stymie long-term recovery. These problems are further complicated by the poor relationship between education above the primary-school level and increased incomes, removing one of the major the incentives for households to invest in education.

C7. WASH and Health

The Government of Myanmar, together with its humanitarian partners has chlorinated 137,188 water sources. 207,000 purification tablets, 39,000 hygiene kits and 19,700 latrine pans have also been distributed. 120 dykes and dams as well as 550 wells have been repaired and rehabilitated across the affected areas, primarily in Bago, Ayeyarwaddy and Rakhine.

224 health facilities were damaged by the flooding, according to the Ministry of Health. More than 150,000 children under 5 and 62,000 pregnant and lactating women are estimated to have been affected by the

floods; the Ministry of Health detected 3,172 cases of children suffering from acute malnutrition in the affected areas. Additionally, through its Early Warning and Alert System (EWARS) the Ministry of Health reported and successfully controlled – through coordinated efforts with local health departments, humanitarian partners and affected communities – six disease outbreaks in affected areas in this period.

Prior to the disaster, an average of 70.46% of households across flood-affected townships had access to safe sanitation (flush toilets or water-sealed latrines) and 65.47% had access to improved drinking water sources (defined as piped drinking water, boreholes, tubewells, protected wells, rainwater collection and springs and bottled water). Most of the flood-affected areas did not deviate greatly from these averages, with the exception of Rakhine where 72.18% of households did not have access to improved drinking water sources and 76.70% did not have access to safe sanitation.

Applying these findings to the 40 most-affected townships provides clarity about the nature and extent of WASH needs across the affected areas. With reference to the table below, within each quadrant, each township is listed in order of their share humanitarian need and the number of flood-affected houses (including totally-damaged and partially-damaged housing units as well as houses which were flooded and received minor damage) has been included next to each township name in order to provide a reference for the scale of household WASH needs.

The majority of severely-affected townships fall into a large group in the upper-right quadrant. Due to the extent and intensity of damage to housing, infrastructure and farmland in these areas, it is inferred – in absence of a full catalogue of the impact of the disaster on household-level WASH – these areas will require extensive repairs to and reconstruction of their water supply and sanitation infrastructure.

Summary of WASH needs – data from the Census, MoSWRR and MNPED; numbers indicate number of flood-affected houses

	Low access to safe sanitation	**High access to safe sanitation**	
High access to improved drinking water	Monyo (17,015)	Tedim (442) Paletwa (1,900) Pwintbyu (25,358) Ingapu (17,592) Kale (18,989) Hakha (853) Tonzang (430) Tamu (1,461) Falam (112) Taikkyi (13,859) Hinthada (11,665) Kawlin (14,241)	Matupi (41) Gangaw (100) Thantlang (2) Kyaunggon (13,794) Yegyi (15,128) Sittwe (806) Thayarwady (9,413) Letpadan (7,774) Zalun (8,837) Ngape (71) Homalin (2,480)
Low access to improved drinking water	Buthidaung (38,526) Ann (3,181) Maungdaw (29,935) Mrauk-U (42,450) Ponnagyun (3,399) Rathedaung (2,216) Minbya (2,403) Kanpetlet (75) Pauktaw (1,718) Kyauktaw (3,561) Kyaukphyu (12)	Mindat (123) Kalewa (2,7131) Sidoktaya (2,303) Padaung (7,085) Nyaungdon (11,150)	

The bottom-left quadrant, populated mainly by townships in Rakhine, correspondingly contains the highest concentration of households without toilets across all affected areas. In addition to the development of WASH infrastructure – which has so far been largely missing from these areas – hygiene promotion and behaviour change communication may also be needed.

D. Coordination

The NNDMC coordinates national-level disaster response activities. The NNDMC delivers relief and recovery services through the EOC, RCC and the Recovery Planning Forum which are, in turn, responsible for liaising with state-and-region-level authorities to develop contextualised and appropriate local intervention plans.

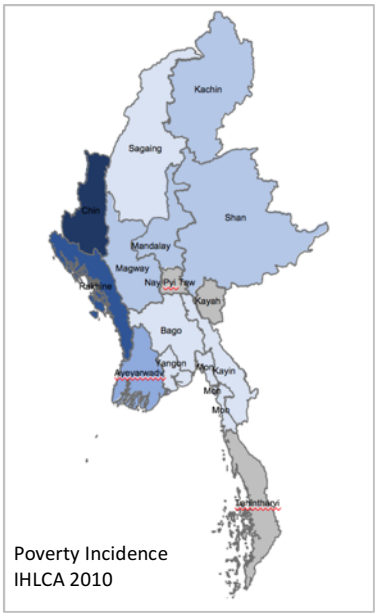
Recovery Coordination Centre, Naypyidaw: E-learning Centre, Building no. 11, Ministry of Construction, Zabu Thiri Township, Naypyidaw; Tel: 40-7168; 40-7451

Recovery Coordination Sub-centre, Yangon: No. 9, Kyaikkwine Pagoda Road, Ward No. 3, Mayangone Township, Yangon; Tel: 01-661812/ 652699/ 661812/ 652699/ 374301; 09-5111368

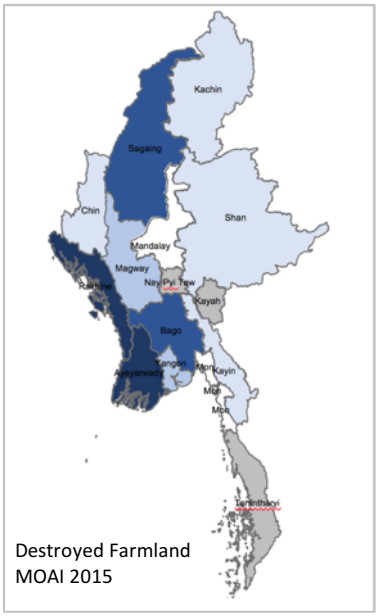
Recovery Coordination Sub-centre, Mandalay: Office of the Director, 30th Street, Department of Roads, Mandalay; Tel: 02-39284/ 39286; 09-503560

E. Summary of Disaster Effects

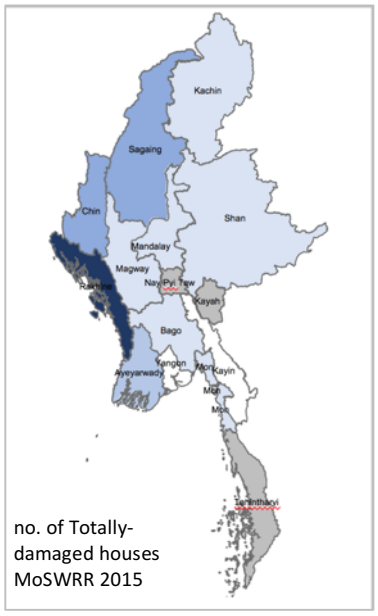
Darker colours indicate higher numbers or percentages; areas in grey reported no significant damage.



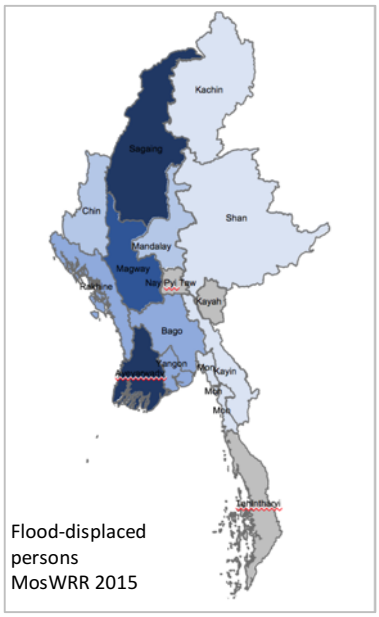
Poverty Incidence
IHLCA 2010



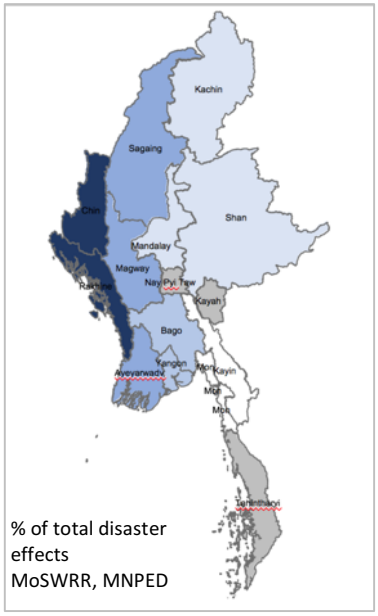
Destroyed Farmland
MOAI 2015



no. of Totally-damaged houses
MoSWRR 2015

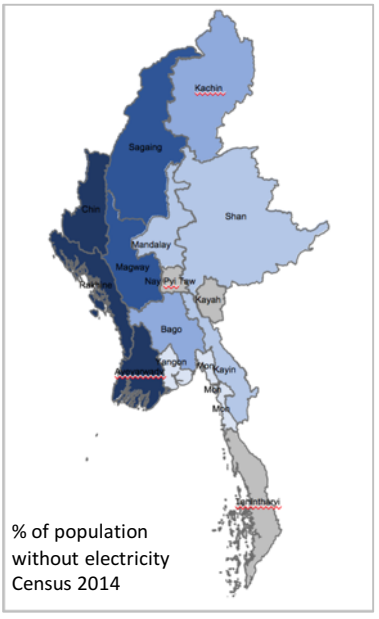


Flood-displaced persons
MosWRR 2015

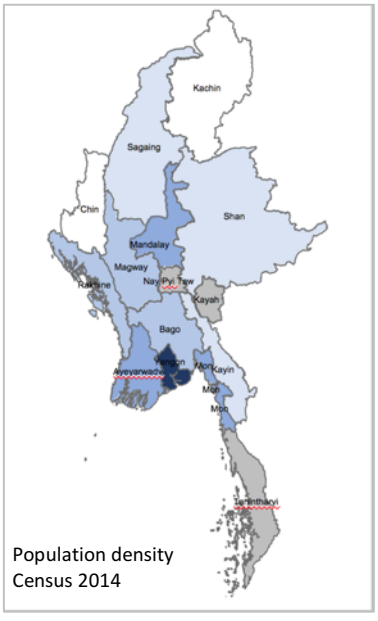


% of total disaster effects
MoSWRR, MNPED

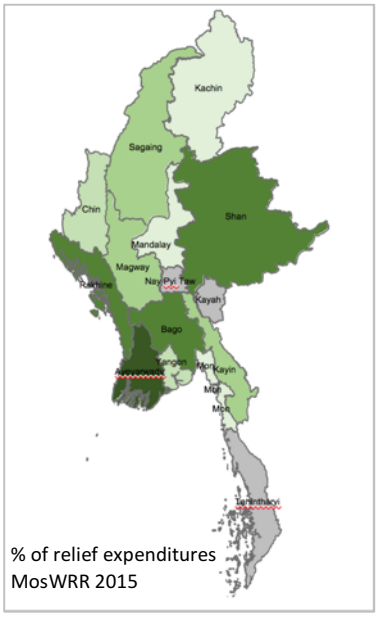
% of population without safe sanitation
Census 2014



% of population without electricity
Census 2014



Population density
Census 2014



% of relief expenditures
MosWRR 2015

F. Map of Proposed Road Construction Projects in Chin State (in red)