WFP & UNDP
RAPID ASSESSMENT OF THE
POTENTIAL IMPACT OF
1. DELAYED RAINS ON HARVESTS
IN SELECTED AREAS ACROSS MYANMAR

WFP’s Vulnerability Analysis & Mapping Unit (VAM) & UNDP
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Background

In light of reports from the field about the potential severe impact of the present delay in rains on harvest which in turn would reduce food availability and increase food insecurity; WFP and UNDP decided to conduct a rapid assessment on the impact of delayed rains.

Data was collected in the first week of June from all WFP program areas (eight in total: Taunggyi, Magway, Kachin, Northern Rakhine State, Kokang, Wa, Chin and Lashio) and three UNDP program areas (Delta, Dry Zone & Shan). For WFP the total sample size was 1200 farmers with 150 farmers being sampled from each program area. UNDP collected data from over 2200 farmers from their program areas.

The report analyzes the findings on the impact of delayed rains in the above mentioned areas. The aim of this report is to highlight areas which could potentially be the worst affected by the delayed rains if the rains continue to be delayed this season and rainfall this year is reduced in volume.

Both the WFP and the UNDP would like to thank its partners, cooperating agencies and other UN organizations for assisting in this exercise and ensuring that this rapid assessment was possible.

Main Findings

A. Based on the data collected the effect of the delay in rains on the current harvest is not expected to have the severe repercussions initially assumed. On average rains in Myanmar have been delayed by a month in most areas. At the time of writing, many areas have experienced sporadic rainfall in May. Thus at first glance the’ delay’ in rains seems to be over. However if there is insufficient or no rainfall in the month of June and July, the rice and maize harvests (late August / September) are going to be severely reduced. In such a scenario the loss of harvest can conservatively be estimated at 25% - 30%.

B. Farmers were mainly concerned and apprehensive about the reduced rainfall (rather than a delay in rains) and this they felt would be a major obstacle to this year’s harvest. Farmers were also asked about the potential damage to their crop or the percentage of loss in harvest that they expected. In many areas farmers estimated a loss of up to 70% of their harvest in August / September. This figure needs to treated with care, as typically such figures could be inflated and being more a measure of farmer concern than on-ground reality.

C. The majority of farmers report being able to cultivate only one harvest in a year.

The above is compounded by the fact that an extremely low percentage of farmers have access to formal irrigation systems. With the exception of farmers in Wa, more than 85% of farmers had no access to irrigation systems and instead relied on natural sources for water for agricultural purposes.

Given that 8 out of 10 farmers harvest once a year and rely on natural resources for all their water requirements, a reduction in rainfall received will have serious repercussions on food availability.
D. Areas where current harvest is most likely to be affected by delayed rainfall

1. Taunggyi
2. Lashio
3. Chin

E. Area where current harvest is less likely to be affected by delayed rainfall

1. Kachin
2. NRS
3. Kokang
4. Delta

Note: This is not to suggest that food security is high in the above areas or that a good harvest can be expected; just that delayed rainfall seems likely to have less of an adverse effect on harvest as compared to other program areas. Other factors (lack of inputs, high pathogen incidence, lack of land etc) affect harvest in these regions.

F. The most commonly cited constraints to current harvest as reported by the sample were:

1) Loss of crop due to insufficient rains
2) Loss of crops due to pests / pathogens
3) Inability to afford basic agricultural inputs

Thus the major constraints to agriculture is the lack of water (as farmers almost completely rely on natural resources), the loss of crops to pests and the inability to combat diseases / pathogens or increase their yield as they lack access to basic inputs such as seeds or fertilizers.

G. The most common coping strategies that farmers selected as options they would resort to in case of a lowered yield were:

1) Purchase food on credit or incur debts in order to afford food for the HH
2) Rely on less preferred food (which are less expensive)
3) Restrict the food consumption of adults in order to enable children to eat sufficiently

Two of the above coping strategies would be unsustainable over a prolonged period of time resulting in either households being trapped in a debt cycle and being forced to take out ever-increasing loans (purchase food on credit) or resulting in health complications for adults (adults restricting their food consumption)

A sizeable proportion of farmers also stated that they would shift to doing temporary casual labor in order to earn incomes if harvest were low. It is unclear how feasible such a strategy could be since a failure in harvest would also drastically reduce the labor requirement in rural areas.
A brief analysis of WFP / UNDP data and Ministry of Agriculture/ FAO data

While the WFP and the UNDP collected data from farmers regarding the delay in rains, the impact on food security and the constraints farmers face; the FAO and the MoA collected data on total area of rice sown across the country (both datasets pertaining to the first week of June).

- From the data collected by the WFP & UNDP can be seen that the impact of delayed rains is not expected to have the severe repercussions initially assumed primarily because rains have been reported in most sampled areas in the first week of June. Farmers were most concerned with the possibility of receiving inadequate rainfall this year rather than the one month delay in rainfall (on average) which has occurred.

From the data it is also estimated that if there is insufficient or no rainfall in the month of June and July, the rice and maize harvests (late August / September) can conservatively be estimated to be reduced by 25% - 30%.

- However from the data released by the MoA / FAO the rice harvests are already expected to be, on average, 40% lower than the previous year (country-wide) due to the delayed rains. This estimate is based on the lowered planting acreage of rice reported this year as compared to last year.

As per the official data, a total of 727,482 acres of rice were sown across Myanmar as on the first week of June 2010. For the same period in 2009, the total sown acreage of rice was 1,230,420. Thus the sown acreage sees a decrease of 40% from 2009. The states / divisions with the greatest difference in sown areas are reported to be the Delta, East-Shan & East

However a few factors need to be noted:

1. The official data was either collected just before rains started or just when rains had finally begun.
2. Typically, farmers will wait for rains to begin planting. Thus this decrease of 40% in sown land will no longer be so high since in many places farmers would have sown rice (following the onset of rains in their area).
3. The fact that the delay has been a month in many places means that the whole season has become slightly shorter. This will of course have an adverse impact on yields.
4. However, if the next two months see adequate rainfall, then the damage due to delayed rains will not be extremely high (as reported to us by the sampled farmers)
5. This is the reason why farmers are today more apprehensive about the volume of rainfall expected rather than the impact of a delay.

Keeping in mind both sets of data, it can be stressed that while there will be some loss of harvest due to delayed rains which results in the agricultural season being shorter, the most crucial factor today is the volume of rainfall that farmers will receive in the next 2 months.

However, if there is a further delay in rainfall or an inadequate rainfall in the next two months, given that sowing areas are less than last year resulting in a shorter season combined with the loss of harvests due to lack of water – a significant loss of rice harvest can be expected.
ANNEX

Data for each area is listed below.

1. Taunggyi

Sixty seven percent (67%) of farmers reported one harvest while 33% reported being able to obtain two harvests in a year.

The main crops grown in Taunggyi are:
1. Rice – More than 75% of the sample reported some rice cultivation. On average, a rice farmer had access to 1.2 acres of land.
2. Beans / Peas – Beans and / or peas were cultivated by 70% of the sample and average acreage per farmer was 0.8 acres.
3. Maize – Fifty percent (50%) of farmers cultivated maize on an average plot size of 0.9 acres.
4. A small proportion of farmers reported growing groundnut, chili and sesame.

Planting & Harvesting Times

a) Rice: The majority of farmers reported the planting time of rice to be in the months of May & June and the harvesting time to be from August onwards.
b) Beans / Peas: The planting time was in the months of May & June with harvesting to begin from September onwards.
c) Maize: For Maize, planting began from the beginning of May and includes June while harvest of the crop was expected from September onwards.

Constraints to Agriculture

The main constraint to farmers was the damage to crops due to the delayed rains (see below); reported by 94% of all farmers sampled. The problem of delayed rains is compounded by the fact that nearly 90% of farmers do not have access to irrigation systems and thus have to depend on natural sources for water for agricultural purposes.
Coping Strategies

Farmers were asked how they would cope and obtain sufficient food for the household if their estimations of a lowered harvest were proven right.

The most common coping strategies that farmers selected as options they would resort to in case of a lowered yield were:

a) Limit Portion Size at Meals
b) Restrict the food consumption of adults in order to enable children to eat sufficiently
c) Reduce the number of meals eaten in a day

Impact of delayed rainfall

Farmers were asked about rainfall patterns in their area for the current as well as previous year.

- Last Year: Nearly 60% of all farmers reported the rains as beginning last year in June. For a smaller percentage of farmers, rains began in May last year. For most farmers the period of mid May to mid-June was when the rainy season began last year.

- Current Year: Almost the entire sample had yet to receive any rainfall at the time of data collection. More than 80% of farmers stated that they expect to receive rainfall in July or August with only 5% of farmers expecting rains in their area in June.

Thus farmers usually plant staple crops in the months of May & June and traditionally receive rainfall starting from May. The delay in rains is expected to be 2 months amongst most farmers in Taunggyi with rains starting in July instead of May and this delay will certainly affect the harvest.

2. Magway / Dry Zone

Both WFP & UNDP collected data from the Dry Zone. Forty one percent (41%) of farmers reported one harvest while 59% reported being able to obtain two harvests in a year.

The main crops grown in Magway are:

1. Sesame – More than 90% of the sample reported cultivation of this crop. On average, farmers growing sesame had access to 4 acres of land.
2. Beans / Peas – Beans and / or peas were cultivated by 57% of the sample and average acreage per farmer was 4 acres.
3. Oil seed – Nearly 90% of the sample cultivated oil seed plants and the average planting area per farmer is 6 acres.
4. Other Beans – Fifty percent (50%) of farmers cultivated Green & Pigeon beans on an average plot size of nearly 5 (4.78) acres.
5. Groundnut was cultivated by 42% of the farmers on average land sizes of 4 acres.

Planting & Harvesting Times

a) Sesame: The majority of farmers reported the planting time of sesame to be in the months of May & June with harvests beginning from September onwards.
b) Beans / Peas: The planting time was in the months of May & June and the harvesting time was to be from September onwards.
c) Oil seed: The planting time is May with harvesting beginning from August.
d) Groundnut: For Maize, planting began from the beginning of May and includes June while harvest of the crop was expected from August.

Constraints to Agriculture

The main constraint to farmers was the damage to crops due to the delayed rains reported by 67% of the sample. For the remaining 33%, the main constraint was the loss of crops due to pests and the inability to afford basic agricultural inputs.

It is crucial to note that the entire sample reported no access to irrigation systems

Coping Strategies

The most common coping strategies that farmers selected as options they would resort to in case of a lowered yield were:
   a) Purchase food on credit or incur debts in order to afford food for the HH
   b) Rely on less preferred food (which are less expensive)
   c) Limit portion size of meals
   d) Sell assets (including livestock and jewelry)

It should be noted that purchasing food on credit and the selling of assets are both unsustainable coping mechanisms in the long term. It is worrying to note that 60% of the sample borrows food or money in order to meet the needs of their HH. Any delay in rains in the month of June will only exacerbate the already tenuous food security situation.

Impact of delayed rainfall

- Last Year: More than 80% of farmers reported the rains as beginning last year in May.
- Current Year: Seventy four percent (74%) of the sample reported having just received rains at the time of data collection (May) while the remaining 26% of farmers expected rains in June.

Given that rains usually begin in May and the fact that some farmers had received rainfall in the last week of May, the overall situation in Magway seems to be stable. However if rains do not occur in the month of June then the little rainfall received in May will not have much effect and crop losses will be high.
3. **Kachin**

Ninety percent (90%) of farmers reported one harvest while the remaining 10% reported being able to obtain two harvests in a year.

The main crop grown in Kachin is rice with more than 90% of farmers cultivating this crop exclusively. Very little multi-cropping is seen as compared to other areas of the country.

**Planting & Harvesting Times**

The majority of farmers reported the planting time of rice to be in the months of June and July and the harvesting time to start from the end of October. For upland rice, the planting time differs a little with planting usually starting in May.

**Constraints to Agriculture**

The main constraint to farmers were

1) Loss of crops due to pests / pathogens: For nearly half the sample (48%), the loss of crops (standing crop as well as post-harvest) to pests and pathogens were the main constraint to agriculture.

2) Damage due to delayed rains: Thirty two percent (32%) of all farmers reported that they expected the main constraint to their harvests being the current delay in rains.

**Coping Strategies**

The most common coping strategies that farmers selected as options they would resort to in case of a lowered yield were:

a) Purchase food on credit or incur debts in order to afford food for the HH – This was the most common coping mechanism that farmers stated they would use if their current harvest were drastically reduced.

b) Rely on less preferred food (which are less expensive)

**Impact of delayed rainfall**

- Last Year: 70% of farmers reported the rains beginning last year in May. An additional 15% reported receiving rains in June and for the remaining farmers rains had occurred much later

- Current Year: Nearly ninety percent of farmers report having just received rains at the time of data collection (May) while the remaining percentage of farmers expected rains in June.
Since the planting time of rice in Kachin is relatively late as compared to other areas; end of June and July; at present the potential damage to crop is minimal. Moreover, even the small percentage of farmers planting upland rice in May would have received some rains. However loss of crop will increase if rains are delayed in June and July which is the planting time for almost all farmers. Given that farmers do not perceive the delayed rains as their main constraint also underlines the fact that the adverse impact of delayed rains in Kachin is highly likely to be low.

4. Northern Rakhine State (NRS)

In NRS the majority of farmers are able to cultivate two harvests a year. Seventy six percent (76%) of the sample reported cultivating 2 harvests and only 24% of farmers reported being able to rely on only one harvest (Note: However agriculture in NRS is constrained by various other factors affecting food access and availability, see WFP Sept’09 study on Food Security in NRS).

The main crops grown in NRS are rice (first harvest) and potato (second harvest). All farmers reported the cultivation of both these crops – rice for the first harvest and potato for the second. A sizeable percentage of farmers (35 – 40%) also practiced multi-cropping with the second crop usually being either Cashew nut or beans.

1. Rice & Potato– Every farmer reported planting of these 2 crops and the average plot size ranged between 4.5 to 5 acres.
2. Cashew Nut– This crop was cultivated by 42% of the farmers usually on small land holdings; 0.6 acres on average.

Planting & Harvesting Times

a) Rice: The majority of farmers reported the planting time of rice to start from late June and going on through July with harvesting to begin from mid-October.

b) Potato: Potato was planted for the second harvest at the end of the year. Potato cultivation would occur in the months of November to March. Thus the likelihood of a severe loss of potato yields occurring is only if rains are delayed in the months of October and November.

Constraints to Agriculture

The main constraint to farmers was

1) Inability to afford basic inputs: This was the biggest constraint to agriculture with 30% of farmers citing this factor.

2) Loss of crops due to pests / pathogens: For 25% of the sample the loss of crops (standing crop as well as post-harvest) to pests and pathogens were the main constraint to agriculture. This is related to the most
commonly cited constraint; lack of inputs such as seeds, fertilizers and pesticides.

3) Damage due to delayed rains: Only sixteen percent (16%) of all farmers report the current delay in rains as being their biggest obstacle.

Coping Strategies

The most common coping strategies that farmers selected as options they would resort to in case of a lowered yield were:
   a) Rely on less preferred food (which are less expensive) – 70% of farmers
   b) Purchase food on credit or incur debts in order to afford food for the HH – Fifty percent (50%) of farmers stated they would use if their current harvest were drastically reduced.
   c) Restrict the food consumption of adults in order to enable children to eat sufficiently

Impact of delayed rainfall

- Last Year: According to feedback from the sample, rains in NRS mainly occurred in May and June, with the bulk of farmers reporting June as the start of rains for them.
- Current Year: More than three-fourth of the sample report having just received rains at the time of data collection (May) while the remaining percentage of farmers expected rains in June.

Since the planting time of rice in NRS is predominantly in July followed by June, at present the potential damage to crop is minimal. Keeping in mind that the region has experienced some rain in May, it seems likely that barring a lack of rain in June, the effect on crops in NRS would be low. It is too early to predict if the second harvest will be adversely affected.

However a delay in rains or reduced rainfall in June & July will severely restrict farmers since, like the Dry Zone, NRS farmers too have no access to irrigation sources and rely on natural sources.
It is also important to note that while farmers across NRS estimate losing 35% of their crop; the main reason for this estimated loss is not the delay in rains but factors related to productivity.

5. Kokang

Farmers in Kokang area are only able to harvest one crop a year.
The main crops grown in Kokang are:
   1. Maize – Ninety eight percent (98%) of the farmers reported the cultivation of maize on an average plot size of one acre.
   2. Rice – More than 60% of the sample reported some rice cultivation. On average, a rice farmer had access to one acre of land.
   3. Tea – Approximately 255 of farmers also grew tea on relatively small areas of lands; average te land holding being 0.7 acres.
Planting & Harvesting Times

a) Maize: In Kokang maize is planted in April & May and harvested from October onwards.
b) Rice: The majority of farmers reported the planting time of rice to start from April and going on till July with harvesting to begin from mid-October.
c) Tea: Tea was predominantly planted in June and harvested in the months of March and April.

Constraints to Agriculture

Fifteen percent of farmers reported that they faced no constraint to their agriculture.

For the remaining percentage of farmers, the main constraint to farmers was

1) Inability to afford basic inputs: Forty nine percent (49%) of farmers stated that lack of inputs as the single major obstacle.

2) Damage due to delayed rains: Only nine percent of all farmers report the current delay in rains as being their biggest obstacle.

Coping Strategies

The reliance on coping strategies was far lower in the Kokang sample as compared to other regions from where data was collected. The most common coping strategies that farmers selected as options they would resort to in case of a lowered yield were:

a) Rely on less preferred food (which are less expensive)
b) Purchase food on credit or incur debts in order to afford food for the HH

Impact of delayed rainfall

- Last Year: According to feedback from the sample, rains in Kokang occur earlier than other parts of the country with the majority of farmers reporting March and April as the start of rains for them.

- Current Year: Ninety five percent (95%) of the sample report having just received rains at the time of data collection (May).

Keeping in mind that both planting times and the fact that rains normally start in March / April, the delay in rains which this year occurred only in May could have an adverse effect on the staple crop of Kokang – Maize, which half of all farmers report planting in April.
However farmers will have delayed their planting this year and almost all maize farmers would have planted their crop in May after the rains began in Kokang. The fact that just 9% of farmers consider delayed rains as a major constraint makes it clear that the impact has been minimal in Kokang.

6. Wa Region

Seventy six percent (76%) of farmers reported one harvest while the remaining reported being able to obtain two.

The main crops grown in Wa are:
1. Maize – More than 80% of farmers report the cultivation of maize on an average plot size of half an acre.
2. Rice – Both upland and lowland rice was cultivated across Wa. Lowland rice was grown by more than three-fourth of the sample on average land sizes of an acre while upland rice was cultivated by 63% of farmers; the average acreage for upland rice being less than an acre (0.85)

Planting & Harvesting Times

a) Maize: In Wa maize is planted in April & May and harvested from October onwards
b) Rice: The majority of farmers reported that lowland rice is predominantly planted in May and June and harvested in October and November. Upland rice is planted almost exclusively in April and harvested in September and October.

Constraints to Agriculture

The main constraints to agriculture / increase in yields as reported by farmers were:
1) Damage due to delayed rains: Thirty five percent (35%) of all farmers report the current delay in rains as being their biggest obstacle to increasing crop yields.
2) Inability to afford basic inputs: Twenty one percent (21%) of farmers stated that lack of access to inputs as the second most common contributing factor to low yields.

3) Loss of crops due to pests / pathogens: For 15% of the sample the loss of crops (standing crop as well as post-harvest) to pests and pathogens were the main constraint to agriculture.
Coping Strategies

The reliance on coping strategies in Wa was the lowest seen when compared to data from other parts of the country. HHs mainly purchased food on credit or undertook loans or stated that they would earn additional incomes by having family members’ source temporary casual labor.

Impact of delayed rainfall

- Last Year: According to feedback from the sample, rains in Wa began in April for 495 of the sample; while the remaining farmers report first receiving rains in May.
- Current Year: The entire sample for Wa reported having received rains in May.

Thus for Wa, there has been a delay in rains in some parts of the region with rains arriving in May instead of April. This delay would most affect upland rice farmers and some maize farmers. However the estimated damage to crop according to farmers is far lower than in other areas.

Hence, while there has been delay in rains, at present all sampled areas have received rain and the damage to harvests can therefore be expected to be limited (assuming adequate rainfall in June). This could be the reason why across Wa, on average, the estimated loss of harvest is pegged at 10 – 14%.

7. Chin

Almost all farmers in Chin are able to cultivate only once per year with just 6% of farmers reporting two yields. Across Chin, farmers mainly grow maize or rice. Very few farmers grow other crops such as garlic, onions or peas. Average land holdings per farmer ranged between 1.2 – 1.5 acres.

Planting & Harvesting Times

a) Maize: This crop was predominantly planted in April and May with the harvest of crop starting from August onwards.

b) Rice: The planting of rice in Chin was predominantly in the month of May but a sizeable proportion of farmers also reporting it’s planting in the months of June and July. The harvesting of Rice was in November.

Constraints to Agriculture

The main constraint to farmers was

1) Damage due to delayed rains: For almost half the sample the biggest constraint was the damage due to delayed rains.

2) Loss of crops due to pests / pathogens: Thirty percent (30%) of the sample stated
the loss of crops (standing crop as well as post-harvest) to pests and pathogens were the main constraint to agriculture.

Coping Strategies

The most common coping strategies that farmers selected as options they would resort to in case of a lowered yield were:

a) Purchase food on credit or incur debts in order to afford food for the HH – Eight two percent (82%) of farmers stated they would purchase food on credit or undertake loans if their current harvest were drastically reduced.

b) Rely on less preferred food (which are less expensive) – 47% of farmers

c) Rely on food aid – Thirty two percent (32%) of farmers food aid was the main option that they stated they would rely on if their harvest failed. This reliance on food aid was the highest seen.

Impact of delayed rainfall

- Last Year: 60% of farmers reported the rains beginning last year in May. However 35% of farmers stated that last year they had received rains in March and April. Thus a sizeable percentage of farmers usually receive rains as early as March.

- Current Year: The data collected for the current year is very similar to data on last year’s rainfall with thirty seven percent (37%) of farmers having received some rain in March and April and the remaining farmers receiving rain in May.

However while last year the total number of months that farmers received rainfall was 5, this year the total number of months that farmers expect to receive rainfall is drastically lower at 1.4. Thus while rain has arrived in Chin at more or less the normal time frame; the amount of total rainfall is perceived to be far less this year. Hence farmers in Chin are affected not so much by delayed rainfall but a reduced amount.

8. Lashio

Almost all farmers in Lashio are able to cultivate only once per year.

As was seen in the case of Chin, farmers in Lashio mainly cultivate rice (86% of farmers) or maize (76%) with approximately 21% cultivating potato. Thus some multi-cropping is seen in Lashio.

Planting & Harvesting Times

a) Maize: This crop was predominantly planted in April, May and June with the harvest of crop starting from September onwards.

b) Rice: The planting of rice in Lashio was in the months of May and June with harvesting of the crop in October and November.

Constraints to Agriculture
No data available.
Coping Strategies

The most common coping strategies that farmers selected as options they would resort to in case of a lowered yield were:

1) Purchase food on credit or incur debts in order to afford food for the HH – This was the most common coping mechanism with 81% of farmers stating they would resort to this strategy if their current harvest were drastically reduced.

2) Rely on less preferred food (which are less expensive) – 78% of farmers

Impact of delayed rainfall

- Last Year: Half the sample reported receiving rains in April and in all, more than 90% of farmers received rains in April and May.

- Current Year: There has been a clear delay in rains with less than 4% of farmers having received rains in April this year (as compared to 51% last year). However 84% of the sample state having received some rains in May.

Hence the delay of one month in the start of rains would have affected maize farmers across Lashio. A very high discrepancy is also seen between the amount of rain received last year (in terms of months) and the total expected rainfall this year. The previous year farmers report receiving rainfall for nearly five months while for this year the expected number of months is less than two.

9. Delta

Delayed rain assessment in dry zone covered 4 UNDP townships; Bogale, Mawlamyinegyun, Labutta and Kyaiklat and a total of 586 samples were collected from 60 villages. Forty nine percent (49%) of farmers reported that they are able to harvest one time while 51% reported two times in a year. Farmers from fresh water zones are able to harvest two times. Almost all of Kyaiklat Township, 65% of Bogale and 40% of Mawlamyinegyun Township are located in fresh water areas. However Labutta Township is in a saline water zone and thus farmers in Labutta are only able to cultivate a single harvest.

The main crops grown in Delta are:

1. Monsoon paddy – 100% of the sample reported monsoon paddy cultivation. Average planting acre per farmer is 9.7 acre.

2. Summer paddy – was grown by 21% of sample with the average planting area being 3.4 acre

3. A small proportion of farmers reported growing chili, betel nut, betel leave and vegetables.

Planting and Harvesting times

Monsoon paddy: Eight six percent (86%) of the farmer reported that they plant the monsoon paddy in June and July and harvest in November and December.

Summer paddy: Eight nine percent (89%) of farmers y reported that they plant summer paddy in December and January with harvests beginning in March.
Constraints to Agriculture

The main constraints to farmers in delta were:
1) Loss of crops due to pests – reported by 63% of the sample.
2) Cannot afford quality input (seeds/fertilizers, etc.) - 39%
3) Damage due to flood - For 24% of the sample paddy fields were flooded with saline water when Nargis struck and soils were damaged significantly reducing paddy yields.
4) Damage due to delayed rain is not a major problem in delta

Coping strategies

Farmers were asked how they would cope and obtain sufficient food for the household if their estimations of a lowered harvest were proven right.
The most common coping strategies that farmers selected as options they would resort in case of a lowered yield were:
   a) Purchase food on credit, incur debit or borrow food, - 70%
   b) Rely on less preferred and less expensive food – 60%
   c) Limit portion size at meals - 28%

Impact of delayed rainfall

Farmers were asked about rainfall patterns in their area for the current as well as previous year.

- Last year: Sixty two percent (62%) of sample reported that the rain began in April last year
- This year: Seventy eight percent (78%) of sample reported that the rain began in late May this year

Although rains were delayed by a month compared with last year for the major crop, monsoon paddy, planting time in delta area is June and July. Hence delayed rainfall is not a major course of paddy damage and lowered production. In addition, only 17% of sample reported this fact as one of the major constraints in agriculture.

10. Shan

Delayed rain assessment in Shan zone covered 6 UNDP townships; Naungcho, Pinlaung, Pekhon, Kalaw, Kyaukme and Thebaw with 903 samples collected from 90 villages.
Twenty eight percent (28%) of farmers reported that they are able to harvest one time while 58% reported two times in a year and 9% being able to harvest 3 times in a year.

The main crops grown in Shan Zone are:

1. Monsoon paddy – Eight one percent (81%) of the sample reported monsoon paddy cultivation. Average planting acre per farmer is 1.8 acre.
2. Maize/corn – Fifty nine percent (59%) of sample cultivated and average planting acre is 2.7 acre.
3. Bean/pea – Thirty seven percent (37%) of sample cultivated and average planting acre is 1.7 acre
Planting and Harvesting times

Monsoon paddy: The majority of farmers reported that they plant the monsoon paddy in June and July and harvest in November and December.
Maize/corn: This crop was planted in May and June with harvests beginning in October.

Constraints to Agriculture

The main constraints to farmers in Shan zone were:
1. Damage due to delayed rain and not enough water - 65%
2. Loss of crops due to pests - 43%.
Seventy one percent (71%) of sample reported that their land does not have to irrigation system. So, majority of the farmer depend on rain in planting.

Coping strategies

The most common coping strategies that farmers selected as options they would resort in case of a lowered yield were:
1. Purchase food on credit, incur debts or borrowed food - 75%
2. Rely on less preferred and less expensive food - 69%

Impact of delayed rainfall

Farmers were asked about rainfall patterns in their area for the current as well as previous year.

- Last year: 54% and 42% of the sample reported that the rain began in April and May respectively.
- This year: 83% of sample reported that the rain began in May this year

Thus rains across Shan have been delayed by a month and this delay might affect Maize farmers to some extent