

Mid-season rice area and irrigated rice yield forecast for the 2016 Main Wet Season in Thailand

Rice area progression in the early stage of the 2016 Wet Season (as of mid of July 2016) in Thailand is presented in this report. The rice area information was generated based on satellite radar images from Sentinel-1A. The processing and classification of rice area from multi-temporal SAR (Synthetic Aperture Radar) data involved rule-based algorithm implemented in MAPscape-RICE® and covered 20 rice growing provinces across different ecosystems (Figure 1). Mid-season yield forecast for irrigated rice was generated using Rice Yield Estimation System (Rice-YES) which assimilates SAR derived information from MAPScape-RICE into ORYZA crop growth model taking into account the effect of genotype, soil, weather, and agronomic management information.

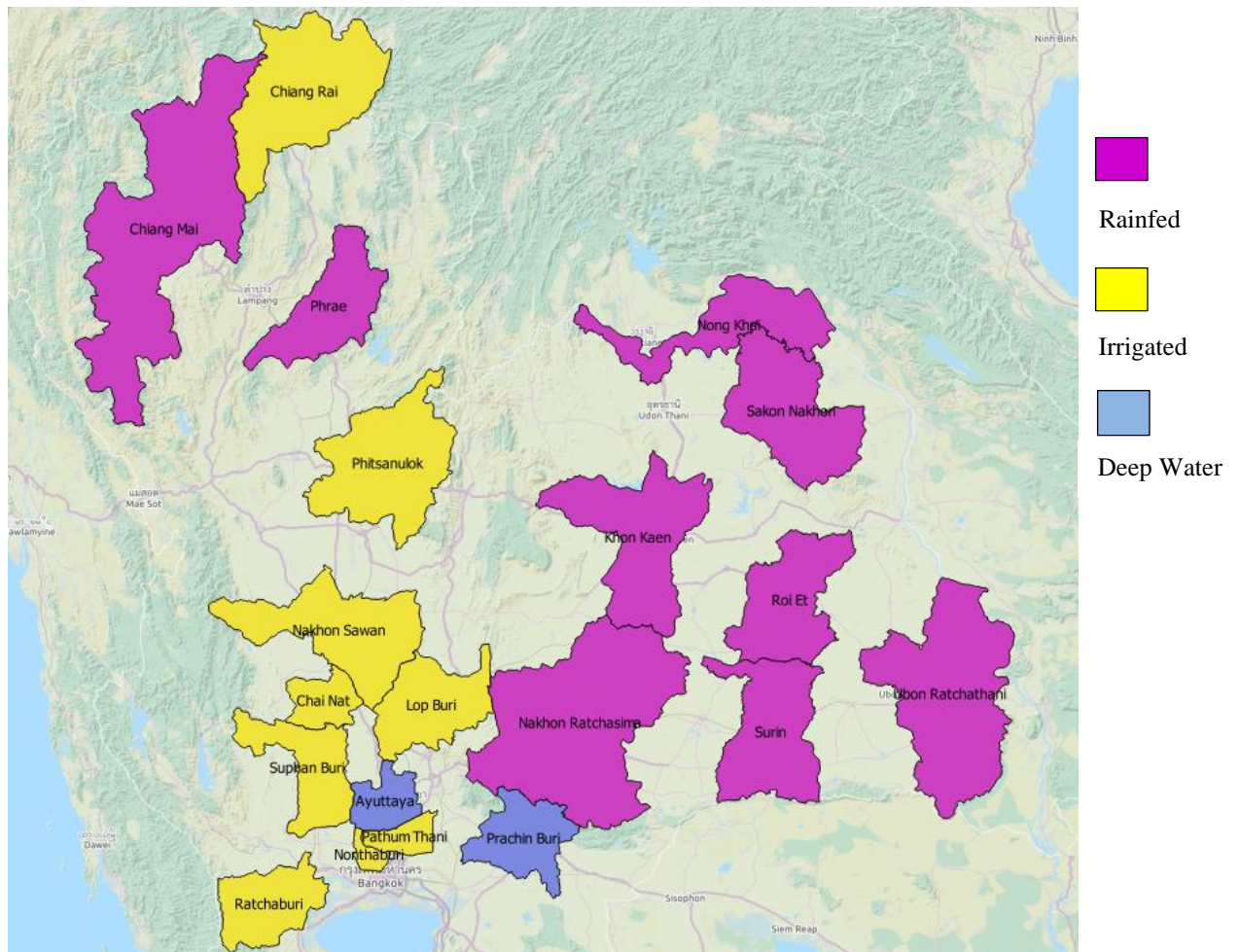


Figure 1. Coverage provinces and relevant ecosystems for rice monitoring under the RIICE project for the 2016 Wet Season in Thailand.

The early-season map (Figure 2) of rice areas as of mid of July covered a total of 24,536,969 rai (Table 1). Overall this number represent 2% decrease compared to 2015 Wet Season data (Source: DOAE) with half of the provinces showing an increase and the other half a decrease in rice area as compared to the last year Wet Season. The largest increase in terms of rice area planted in 2016 was monitored in Ratchaburi province.

This is due to the very extreme low of rice area reported for 2015 Wet Season (8,553 rai) when major planting was started later in August (DOAE, personal communication).

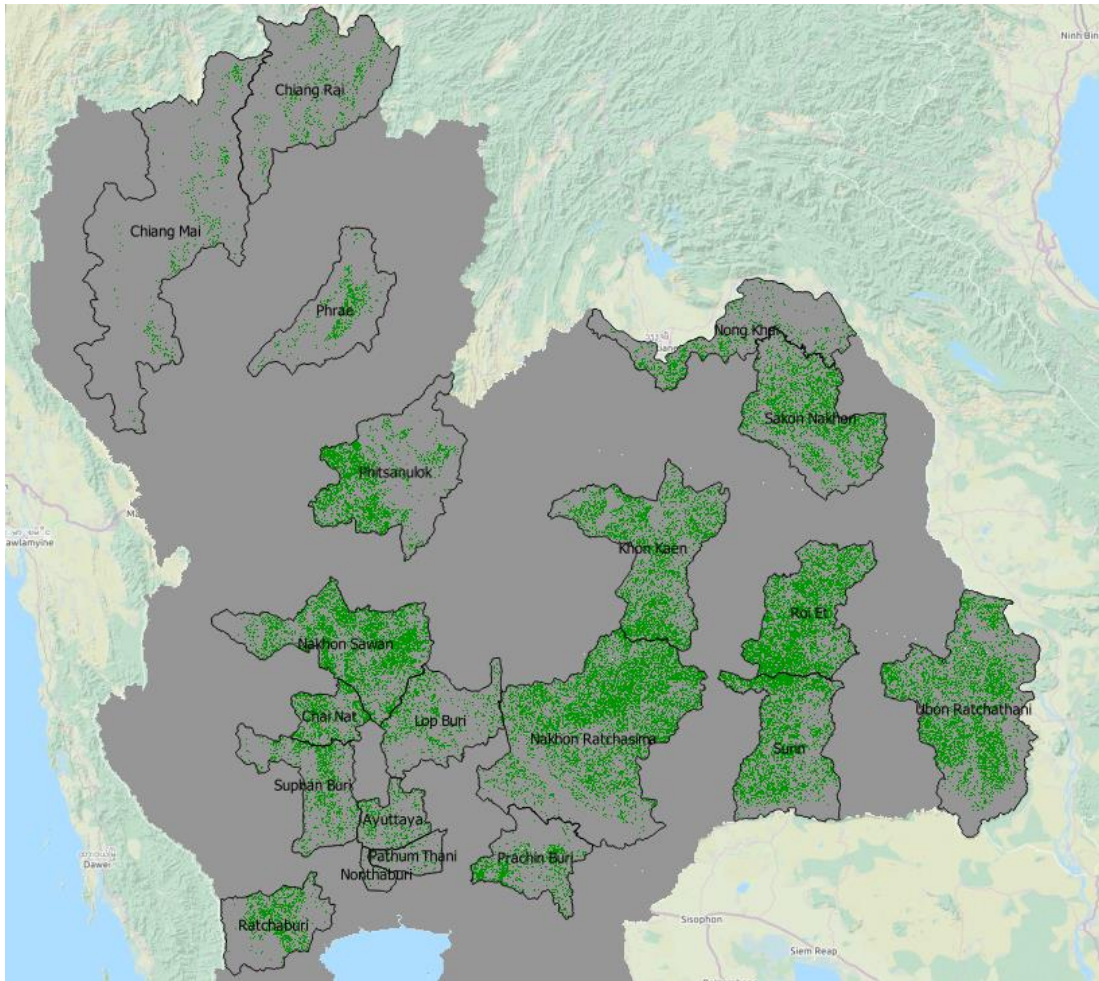


Figure 2. Rice areas detected based satellite radar images from Sentinel-1A (May to July 2016) in Thailand during the 2016 Wet Season.

**Table 1. Early-season rice area based on satellite radar images from Sentinel-1A in the monitoring provinces in Thailand during the 2016 Wet Season.**

Province	2016 WS (RIICE)		2016 - 2015 WS	2015 WS (Stats <sup>1</sup> )
	Rice Area (ha)	Rice Area (rai)	% Change	Rice Area (rai)
Chai Nat	92,592	578,698	41	411,118
Chiang Mai	54,583	341,144	143	140,529
Chiang Rai	73,053	456,583	-40	757,241
Khon Kaen	355,573	2,222,331	-11	2,508,607
Lop Buri	98,351	614,691	19	514,769
Nakhon Ratchasima	694,952	4,343,450	27	3,423,306
Nakhon Sawan	367,271	2,295,444	48	1,550,128
Nong Khai	89,933	562,079	26	445,960
Nonthaburi	3,757	23,484	-62	61,827
Pathum Thani	12,834	80,214	-59	197,991
Phitsanulok	227,573	1,422,331	41	1,010,040
Ayuttaya	46,235	288,969	-51	592,649
Phrae	54,910	343,188	88	182,444
Prachin Buri	86,730	542,060	96	276,809
Ratchaburi	95,200	595,003	6,857	8,553
Roi Et	402,134	2,513,338	-21	3,169,499
Sakon Nakhon	287,371	1,796,069	-6	1,916,622
Suphan Buri	102,821	642,631	-27	881,772
Surin	302,933	1,893,331	-43	3,307,977
Ubon Ratchathani	477,109	2,981,931	-17	3,605,233
<b>Total</b>	<b>3,925,915</b>	<b>24,536,969</b>	<b>-2</b>	<b>24,963,072</b>

<sup>1</sup> Source: DOAE

Table 1 shows the comparison between the rice area planted in 2015 and 2016. Chai Nat, Chiang Mai, Lop Buri, Nakhon Ratchasima, Nakhon Sawan, Nong Khai, Phitsanulok, Phrae, Prachin Buri, and Ratchaburi (highlighted in blue) are provinces with rice area estimates for 2016 Wet Season increased as compared to statistical data (DOAE) from the previous year's wet Season. On the other hand, Chiang Rai, Khon Kaen, Nonthaburi, Pathum Thani, Ayuttaya, Roi Et, Sakon Nakhon, Suphan Buri, Surin, Ubon Ratchathani (highlighted in red) are provinces with rice area estimates for 2016 Wet Season decreased as compared to statistical data (DOAE) from the previous year's wet Season.

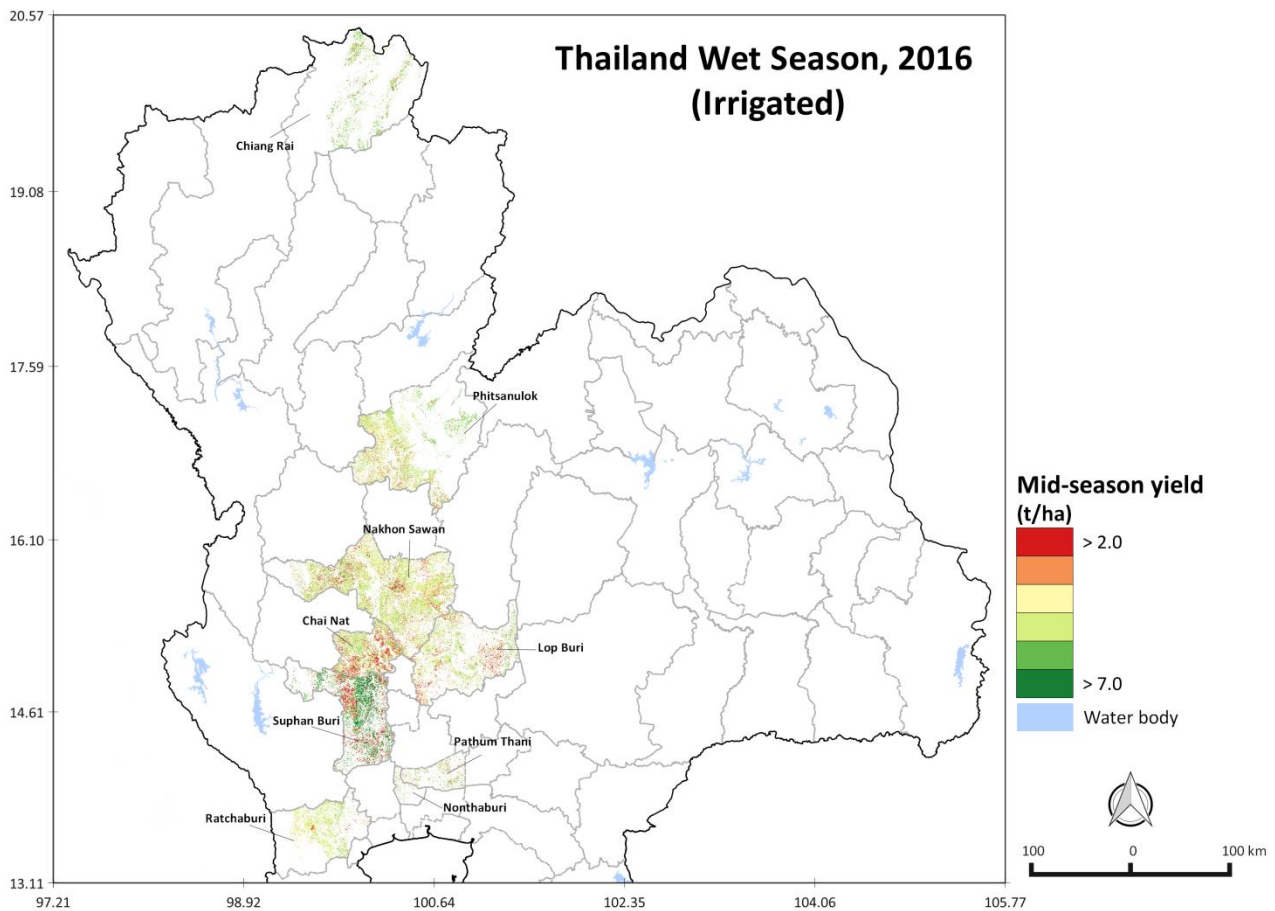


Figure 2. Mid-season irrigated rice yield forecast for the 2016 Wet Season in RIICE monitoring provinces in Thailand.

Forecasted district level yield for the 2016 Wet Season in the monitoring provinces in Thailand for the irrigated rice ranges from 571 kg/rai (3.6 t/ha), in Sankha Buri district in Chai Nat province, to 1,027 kg/rai (6.4 t/ha), in Sam Chuk district in Suphan Buri province, with an average of 738 kg/rai (4.6 t/ha) (Table 2). **Chainat** province on average has the lowest forecasted yield at 640 kg/rai (4.0 t/ha) whereas Suphan Buri province showed the highest average forecasted yield of 848 kg/rai (5.3 t/ha). While across the other monitoring provinces, the value 736 kg/rai (4.6 t/ha) was an average forecasted yield level, such value was rather the minimum forecasted yield at district level for Suphan Buri province which also has the largest standard deviation of the forecasted district level yield of 76.8 kg/rai (0.48 t/ha) as well as the largest range of forecasted yield of 288 kg/rai (1.8 t/ha), from 736 kg/rai (4.6 t/ha) to 1,027 kg/rai (6.4 t/ha). Yield forecast map further highlight such high spatial heterogeneity in yield in Suphan Buri province as compared to other provinces (Figure 2). The smallest standard deviation (17.6 kg/rai or 0.11 t/ha) and range (40 kg/rai or 0.25 t/ha) of the district level yield was forecasted for Nonthaburi province.

**Table 2.** Mid-season yield forecast for the 2016 Wet Season in the monitoring provinces for the irrigated rice in Thailand generated by the RIICE project.

Province	District	Yield forecast (t/ha)	Yield forecast (kg/rai)
Chai Nat	Han Kha	4.13	660.80
Chai Nat	K. Noen Kham	3.67	587.20
Chai Nat	K. Nong Ma Mong	4.41	705.60
Chai Nat	Manorom	4.13	660.80
Chai Nat	Muang Chai Nat	3.69	590.40
Chai Nat	Sankha Buri	3.57	571.20
Chai Nat	Sanphaya	3.68	588.80
Chai Nat	Wat Sing	4.69	750.40
Chiang Rai	Chiang Khong	4.99	798.40
Chiang Rai	Chiang Saen	5.12	819.20
Chiang Rai	K. Doi Luang	5.29	846.40
Chiang Rai	K. Wieng Chiang	4.87	779.20
Chiang Rai	Khun Tan	5.16	825.60
Chiang Rai	Mae Chan	5.16	825.60
Chiang Rai	Mae Fa Luang	5.86	937.60
Chiang Rai	Mae Lao	5.64	902.40
Chiang Rai	Mae Sai	5.19	830.40
Chiang Rai	Mae Suai	5.65	904.00
Chiang Rai	Muang Chiang Rai	5.22	835.20
Chiang Rai	Pa Daet	5.51	881.60
Chiang Rai	Phan	5.37	859.20
Chiang Rai	Phaya Mengrai	5.22	835.20
Chiang Rai	Thoeng	5.27	843.20
Chiang Rai	Wiang Chai	5.22	835.20
Chiang Rai	Wieng Kaen	5.47	875.20
Lop Buri	Ban Mi	4.48	716.80
Lop Buri	Chai Badan	4.36	697.60
Lop Buri	Khok Charoen	4.35	696.00
Lop Buri	Khok Samrong	4.51	721.60
Lop Buri	Lam Son Thi	5.08	812.80
Lop Buri	Muang Lop Buri	3.88	620.80
Lop Buri	Nong Muang	4.67	747.20
Lop Buri	Phatthana Nikhom	4.53	724.80
Lop Buri	Sra Both	4.88	780.80
Lop Buri	Tha Luang	3.68	588.80
Lop Buri	Tha Wung	3.61	577.60
Nakhon Sawan	Banphot Phisai	4.31	689.60
Nakhon Sawan	Chumsaeng	4.41	705.60
Nakhon Sawan	K. Chum Ta Bong	4.49	718.40
Nakhon Sawan	K. Mae Poen	4.91	785.60
Nakhon Sawan	Kao Lio	4.46	713.60

Nakhon Sawan	Krok Phra	4.6	736.00
Nakhon Sawan	Lat Yao	4.34	694.40
Nakhon Sawan	Mae Wong	4.49	718.40
Nakhon Sawan	Muang Nakhon Sawan	4.49	718.40
Nakhon Sawan	Nong Bua	4.25	680.00
Nakhon Sawan	Phaisali	4.35	696.00
Nakhon Sawan	Phayuha Khiri	4.61	737.60
Nakhon Sawan	Tak Fa	4.47	715.20
Nakhon Sawan	Takhli	4.38	700.80
Nakhon Sawan	Tha Tako	4.48	716.80
Nonthaburi	Bang Bua Thong	4.95	792.00
Nonthaburi	Bang Kruai	5.01	801.60
Nonthaburi	Bang Yai	5	800.00
Nonthaburi	Pak Kret	4.83	772.80
Nonthaburi	Sai Noi	4.76	761.60
Pathum Thani	Khlong Luang	4.79	766.40
Pathum Thani	Lam Luk Ka	4.85	776.00
Pathum Thani	Lat Lum Kaeo	4.67	747.20
Pathum Thani	Muang Pathum Thani	4.92	787.20
Pathum Thani	Nong Sua	4.4	704.00
Pathum Thani	Sam Khok	4.89	782.40
Pathum Thani	Thanyaburi	4.82	771.20
Phitsanulok	Bang Krathum	4.34	694.40
Phitsanulok	Bang Rakam	4.43	708.80
Phitsanulok	Chat Trakan	5.36	857.60
Phitsanulok	Muang Phitsanulok	4.46	713.60
Phitsanulok	Nakhon Thai	5.52	883.20
Phitsanulok	Noen Maprang	4.59	734.40
Phitsanulok	Phrom Phiram	4.5	720.00
Phitsanulok	Wang Thong	4.82	771.20
Phitsanulok	Wat Bot	4.82	771.20
Ratchaburi	Ban Pong	5.03	804.80
Ratchaburi	Bang Phae	3.97	635.20
Ratchaburi	Chom Bung	4.65	744.00
Ratchaburi	Damnoen Saduak	4.16	665.60
Ratchaburi	K. Ban Kha	4.33	692.80
Ratchaburi	Muang Ratchaburi	4.79	766.40
Ratchaburi	Pak Tho	4.82	771.20
Ratchaburi	Photharam	4.92	787.20
Ratchaburi	Suan Phung	4.38	700.80
Ratchaburi	Wat Phleng	5.02	803.20
Suphan Buri	Bang Pla Ma	5.23	836.80
Suphan Buri	Dan Chang	5.48	876.80
Suphan Buri	Doembang Nangbua	5.67	907.20
Suphan Buri	Don Chedi	4.99	798.40
Suphan Buri	Muang Suphanburi	5.61	897.60
Suphan Buri	Nong Ya Sai	4.66	745.60



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Suphan Buri	Sam Chuk	6.42	1,027.20
Suphan Buri	Si Prachan	5.04	806.40
Suphan Buri	Song Phi Nong	5.18	828.80
Suphan Buri	U Thong	5.15	824.00
<b>Overall minimum</b>		<b>3.57</b>	<b>571.20</b>
<b>Overall maximum</b>		<b>6.42</b>	<b>1,027.20</b>
<b>Overall average</b>		<b>4.61</b>	<b>737.60</b>

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