Figure 23. Evaluation of the progress of sawah platform improvement on 2009 (left) and 2016 (right) by Google images near A1 site of the Rima River floodplain very near to Arugungu shown in Figure 22. The total area shown is about 10 ha. The length of the scale marker is 100 m. In 2009, almost all aera is covered with micro rudimentary sawah plots. Mean sawah plots size in 2009 is about 40^2m. In 2016, 90% area is covered with standard sawah plots. Mean sawah plots size in 2016 is about 300 m^2.

Figure 24. Evaluation of the progress of sawah platform improvement on 2009 (left) and 2016 (right) by Google images near A2 site of the Rima River floodplain shown in Figure 22. The total area shown is 10 ha. The length of the scale marker is 100 m. In 2009, non-sawah fields and rudimentary sawah are halfway, and in 2016 sawah plots improvement is underway with an area of 80%. Mean sawah plots size in 2016 is about 60 m^2

Figure 25. Evaluation of the progress of sawah platform improvement on 2009 (left) and 2016 (right) by Google images near A3 site of the Rima River floodplain shown in Figure 22. The total area shown is 10 ha. The length of the scale marker is 100 m. In 2009, all area is non sawah field. In 2016 sawah platform improvement began and standard sawah plots covered about 70% of the flood plain. Mean sawah plots size in 2016 is about 100 m^2

Figure 26. Evaluation of the progress of sawah platform improvement on 2009 (left) and 2016 (right) by Google images near Site 1 of the Rima River floodplain shown in Figure 22. The total area shown is 10 ha. The length of the scale marker is 100 m. In 2009, 10% area is rudimentary sawah field and remaining is non sawah fields. In 2016 sawah platform improvement began and standard sawah plots covered about 80% of the flood plain. Mean sawah plots size in 2016 is about 60 m^2

Figure 27. Evaluation of the progress of sawah platform improvement on 2009 (left) and 2016 (right) by Google images near Site 2 of the Rima River floodplain around Birinin Kebbi city shown in Figure 22. The total area shown is 10 ha. The length of the scale marker is 100 m. In 2009, almost all flood plain in this area is non sawah fields. In 2016 sawah platform improvement began and although still rudimentary sawah plots covered about 70% of the flood plain. Mean sawah plots size in 2016 is about 50 m^2

Figure 28. Evaluation of the progress of sawah platform improvement on 2009 (left) and 2016 (right) by Google images near Site 3 of the Rima River floodplain around Birinin Kebbi city shown in Figure 22. The total area shown is 10 ha. The length of the scale marker is 100 m. In 2009, almost all flood plain in this area is non sawah fields. In 2016 sawah platform improvement began and although still rudimentary, sawah plots covered about 40% of the flood plain. Mean sawah plots size in 2016 is about 50 m^2

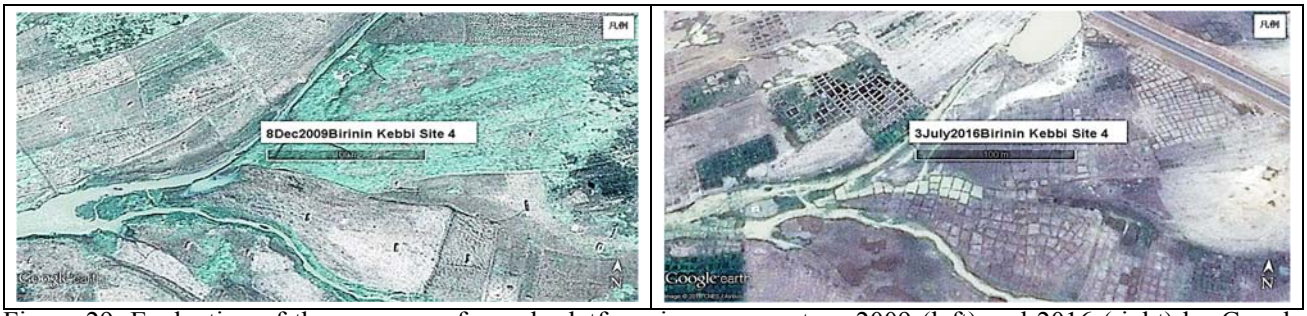

Figure 29. Evaluation of the progress of sawah platform improvement on 2009 (left) and 2016 (right) by Google images near Site 4 of the Rima River floodplain around Birinin Kebbi city shown in Figure 22. The total area shown is 10 ha. The length of the scale marker is 100 m. In 2009, almost all flood plain in this area is non sawah fields. In 2016 sawah platform improvement began and although still rudimentary, sawah plots covered about 40% of the flood plain. Mean sawah plots size in 2016 is about 50 m^2

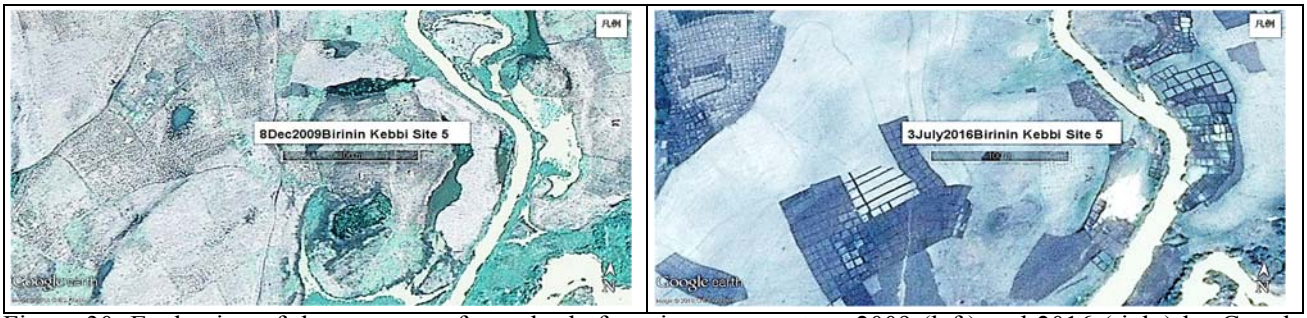

Figure 30. Evaluation of the progress of sawah platform improvement on 2009 (left) and 2016 (right) by Google images near Site 5 of the Rima River floodplain around Birinin Kebbi city shown in Figure 22. The total area shown is 10 ha. The length of the scale marker is 100 m. In 2009, almost all flood plain in this area is non sawah fields. In

2016 sawah platform improvement began and although still rudimentary, sawah plots covered about 20% of the flood plain. Mean sawah plots size in 2016 is about 40 m^2.

5. The Rima River flood plain from Birinin Kebbi to Zamfara River junction: 25,000 ha

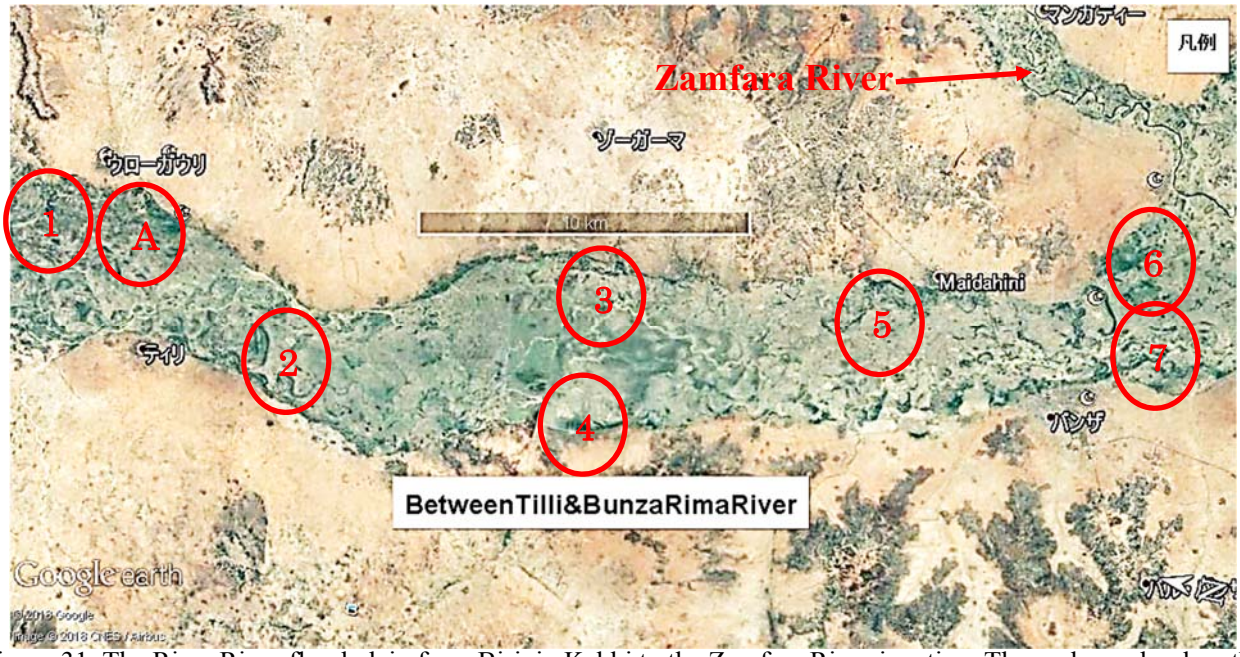

Figure 31. The Rima River flood plain from Birinin Kebbi to the Zamfara River junction. The scale marker length in the figure is 10 km. The area of the floodplain in this picture is about 25,000 ha. The following Figure 32-39 shows progress of sawah systemnplatform improvement between 2009/2010 and 2016 by Google Earth images. As shown below, sawah system development within this figured area is below the average progress in Kebbi state.

Figure 32. Evaluation of the progress of sawah platform improvement between 2010 (left) and 2016 (right) by Google images near Site 1 of the Rima River floodplain from Tilli to Bunza shown in Figure 31. The total area shown is 10 ha. The length of the scale marker is 100 m. Both in 2009 and 2016, almost 100% area are covered with non sawah and ridge rice cultivation.

Figure 33. Evaluation of the progress of sawah platform improvement between 2010 (left) and 2016 (right) by Google images near Site A of the Rima River floodplain from Tilli to Bunza shown in Figure 31. The total area shown is 10 ha. The length of the scale marker is 100 m. In 2010, about 5% area is micro rudimentary sawah. In 2016, 40% land has rudimentary and standard sawah plots. Sawah plots size in 2016 is 20-60m^2.

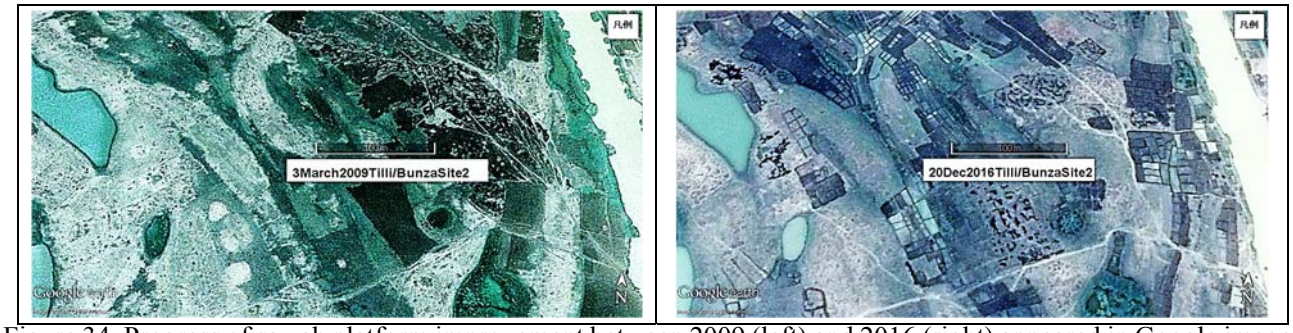

Figure 34. Progress of sawah platform improvement between 2009 (left) and 2016 (right) appeared in Google images near Site 2 of the Rima River floodplain from Tilli to Bunza shown in Figure 31. The total area is 10 ha. The length of the scale marker is 100 m. In 2009, 100% of this flood plain is non sawah ridge rice cultivation. In 2016, sawah systen development is in progress at 20% of the flood plain. Sawah plots size in 2016 is 20-100m^2.

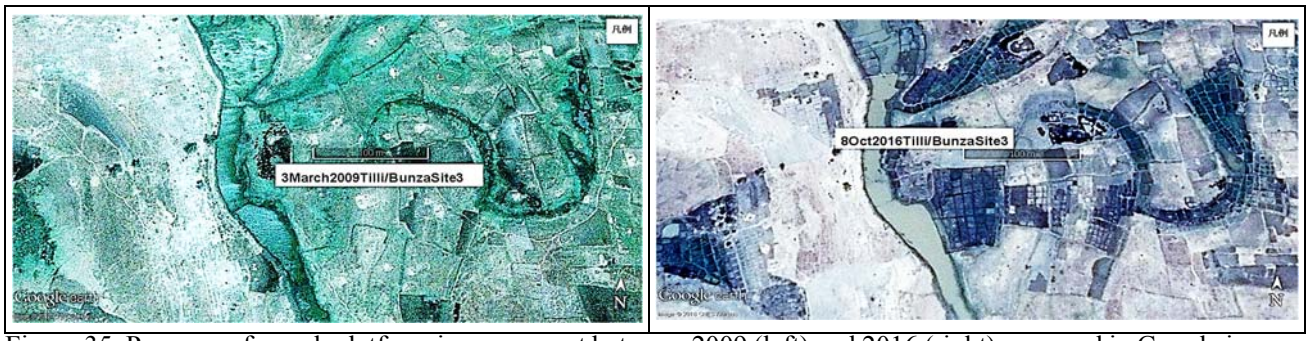

Figure 35. Progress of sawah platform improvement between 2009 (left) and 2016 (right) appeared in Google images near Site 3 of the Rima River floodplain from Tilli to Bunza shown in Figure 31. The total area shown is 10 ha. The length of the scale marker is 100 m. In 2009, 100% of flood plain in this area is non sawah rice cultivation. In 2016, sawah systen development is in progress at 40% of the flood plain. Sawah plots size in 2016 is 20-130m^2.

Figure 36. Progress of sawah platform improvement between 2010 (left) and 2016 (right) appeared in Google images near Site 4 shown in Figure 31. The total area shown is 10 ha. The length of the scale marker is 100 m. In 2010, 100% of the flood plain is non sawah rice or ridge rice cultivation. In 2016, sawah systen development is in progress at 30% of the flood plain. But still ridge rice palnting is common. Mean sawah plots size in 2016 is 50m^2.

Figure 37. Progress of sawah platform improvement between 2010 (left) and 2016 (right) appeared in Google images near Site 5 shown in Figure 31. The total area shown is 10 ha. The length of the scale marker is 100 m. In 2010, almost all flood plain in this area is non sawah rice or ridge rice cultivation. In 2016, relatively good sawah systen development is in progress at 30% of the flood plain. Mean sawah plots size in 2016 is 80m^2.

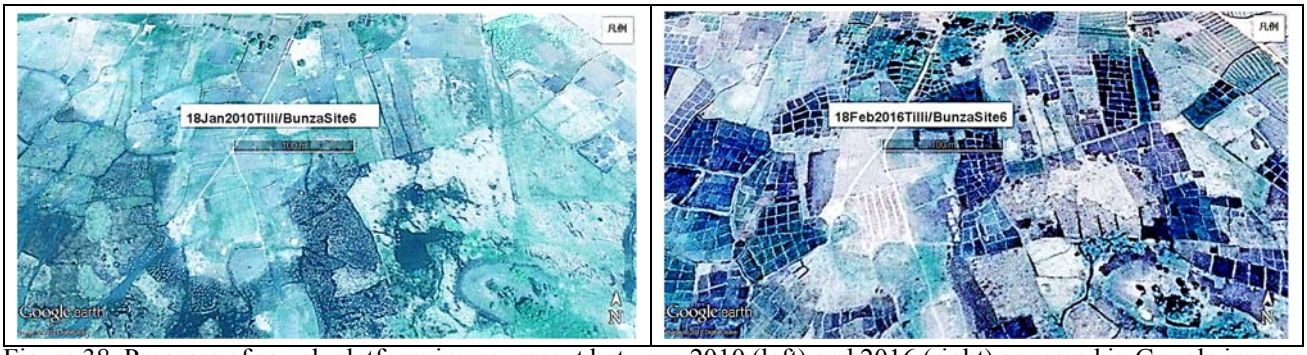

Figure 38. Progress of sawah platform improvement between 2010 (left) and 2016 (right) appeared in Google images near Site 6 shown in Figure 31. The total area shown is 10 ha. The length of the scale marker is 100 m. In 2010, almost all flood plain in this area is non sawah rice or ridge rice cultivation. In 2016, relatively good sawah systen development is in progress at 80% of the flood plain. The Site 6 is adjacent to Sangelu where explosive sawah system development has progressed since 2011. Mean sawah plots size in 2016 is 150m^2.

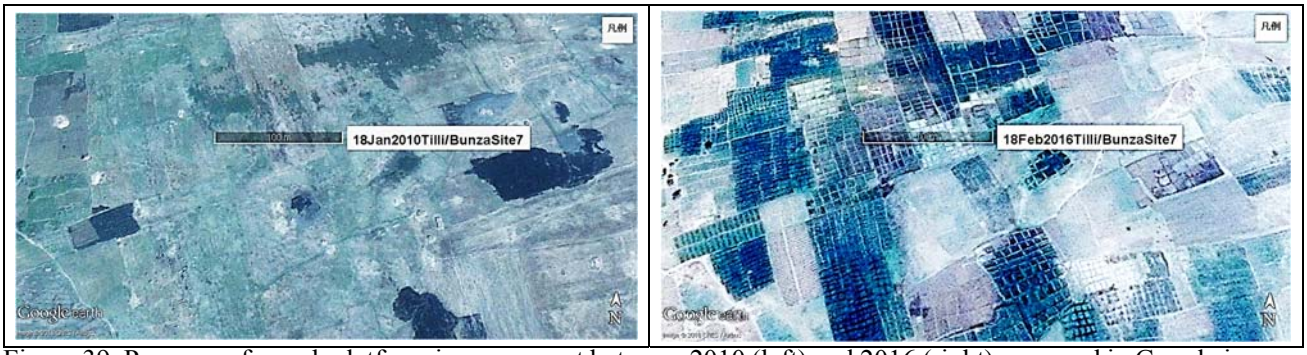

Figure 39. Progress of sawah platform improvement between 2010 (left) and 2016 (right) appeared in Google images near Site 7 shown in Figure 31. The total area shown is 10 ha. The length of the scale marker is 100 m. In 2010, almost all flood plain in this area is non sawah rice or ridge rice cultivation. In 2016, sawah systen development is in progress at 60% of the flood plain. Although sawah plot sie is 30-50m^2. Ridge rice planting is still operating. The Site 7 is adjacent to Sangelu where explosive sawah system development has progressed since 2011. Mean sawah plots size in 2016 is 50m^2. The Site 7 is located on the other side of Site 6 across the floodplain of the Rima river, about 5 km

6. The Zamfara River floodplain near Jega City: 20,000 ha

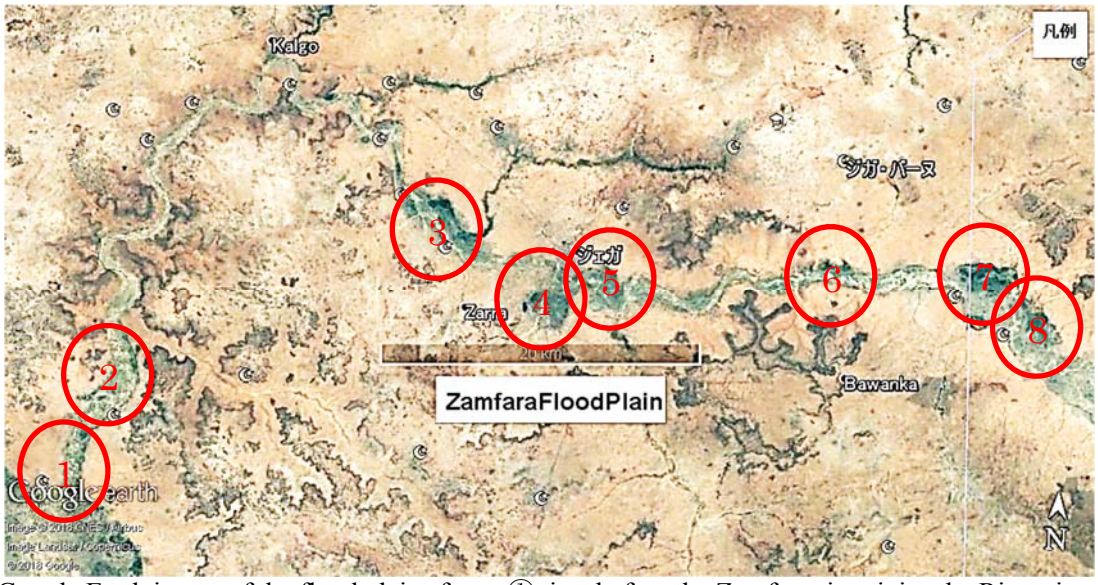

Figure 40. Google Earth image of the flood plains from ① just before the Zamfara river joins the Rima river. to the sites of ⑦ and ⑧ that entered Zamfara province beyond Kebbi province. ③-⑥ are near Jega city area. The scale marker length in the figure is 20 km. The area of the floodplain in this picture is about 20,000ha. The following Figure 41-48 shows progress of sawah system platform development between 2007/2009/2010/2013 and 2014/2016.

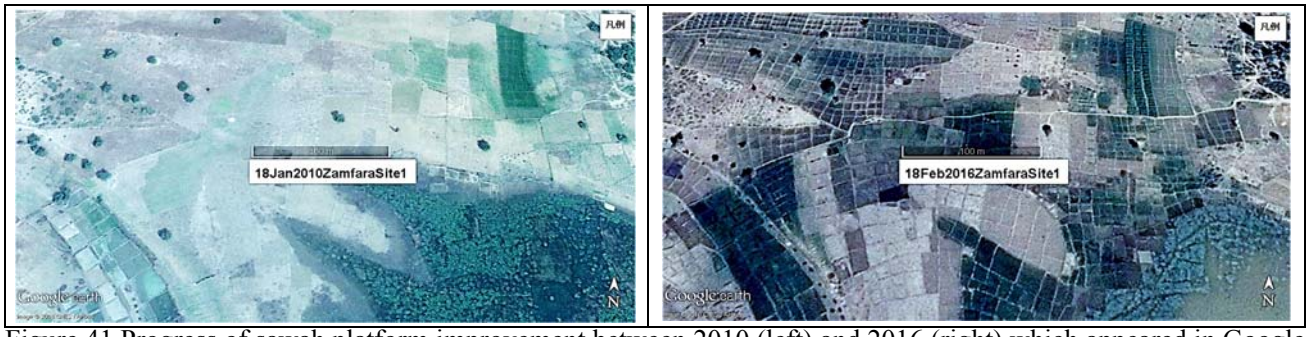

Figure 41.Progress of sawah platform improvement between 2010 (left) and 2016 (right) which appeared in Google image near Site 1 of the Zamfara River floodplain shown in Figure 40. The total area shown is about 10 ha. The length of the scale marker is 100 m. In 2010, about 80% area is non sawah, 10% is ridge rice cultivation and 10% is sawah plots. In 2016, more than 80% is sawah system (mean plots size is 150m^2) and 10% is ridge rice cultivation.

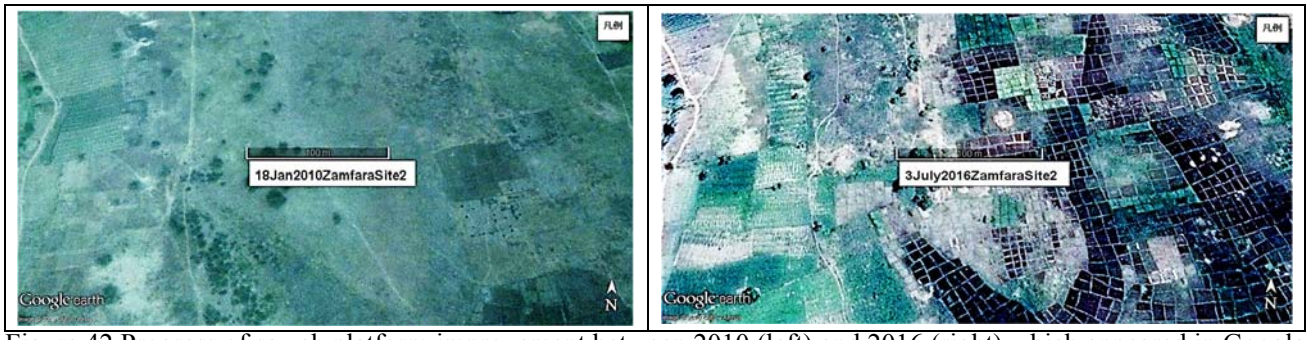

Figure 42.Progress of sawah platform improvement between 2010 (left) and 2016 (right) which appeared in Google image near Site 2 of the Zamfara River floodplain shown in Figure 40. The total area shown is about 10 ha. The length of the scale marker is 100 m. In 2010, about 90% area is non sawah and 10% is ridge rice cultivation. In 2016, 60% is sawah system(mean plots size is 80m^2) and 40% is ridge rice cultivation.

Figure 43.Progress of sawah platform improvement between 2009 (left) and 2016 (right) which appeared in Google image near Site 3 of the Zamfara River floodplain shown in Figure 40. The total area shown is about 10 ha. The length of the scale marker is 100 m. In 2009, about 80% area is non sawah and 20% is ridge rice cultivation. In 2016, 70% is sawah system (mean plots size is 50m^2) and 30% is ridge rice cultivation.

Figure 44.Progress of sawah platform improvement between 2007 (left) and 2016 (right) which appeared in Google image near Site 4 of the Zamfara River floodplain right south of Jega city shown in Figure 40. The area shown is about 10 ha. The scale marker is 100 m. In 2007, as described in the Sawah Technology (5) Kebbi Rice Revolution, 100% of land are covered with micro rudimentary sawah (plot size is <30m^2) and non sawah. In 2016, there are about 20% land is still covered with micro rudimentary sawah and ridge cultivation areas, but the progress of sawah platform improvement (mean plot size is 100m^2) is clearly recognized.

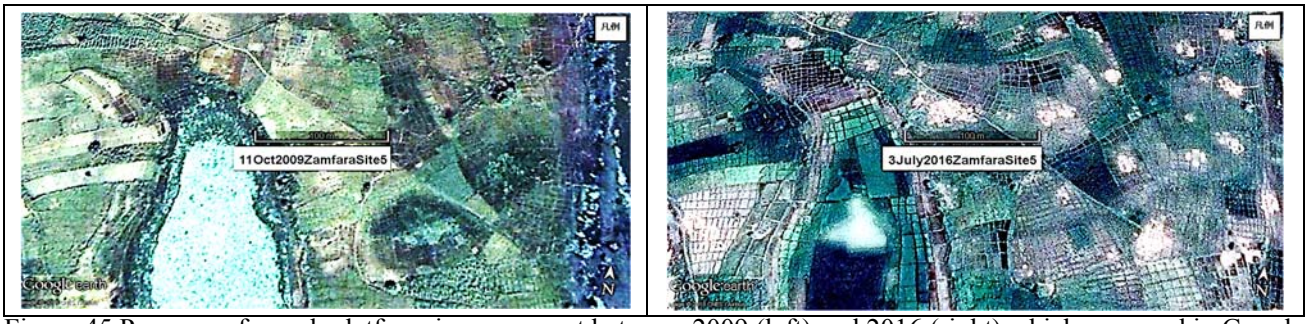

Figure 45.Progress of sawah platform improvement between 2009 (left) and 2016 (right) which appeared in Google image near Site 5 (adjacent to site 4) of the Zamfara River floodplain shown in Figure 40. The area shown is about 10 ha. The scale marker is 100 m. In 2009, 100% of land are covered with micro rudimentary sawah (plot size is <30m^2) and non sawah. In 2016, there are about 30-40% land is still covered with micro rudimentary sawah and ridge cultivation areas, but the progress of sawah platform improvement (mean plot size is 60m^2) is clearly recognized.

Figure 46.Progress of sawah platform improvement between 2009 (left) and 2016 (right) which appeared in Google image near Site 6 of the Zamfara River floodplain shown in Figure 40. The area shown is about 10 ha. The scale marker is 100 m. In 2009, 100% of land are covered with non sawah and ridge rice. In 2016, 60% land is covered with sawah system (mean plot size is 70m^2). Others are non sawah and ridge rice cultivation.

Figure 47. Google images of 2009 (left) and 2014 (right) of Site 7 of the Zamfara River floodplain shown in Figure 40. This site is Zamfara state adjacent to Kebbi state. The total area shown is about 10 ha. The length of the scale marker is 100 m. In 2009, the area presumed to be a sawah system, but it is unclear. In 2014, sawah system improvement is progressing all over the area (mean plot size is 100m^2)

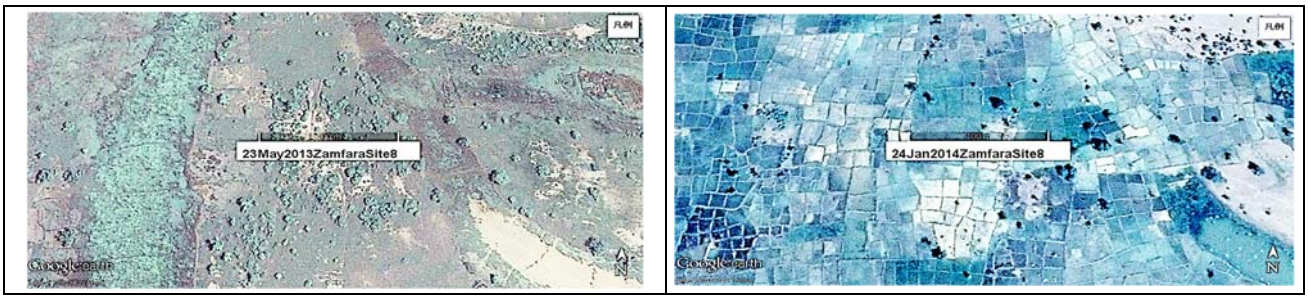

Figure 48. Google images of Site 8 of 2013 (left) and 2014 (right) of the Zamfara River floodplain shown in Figure 40. This site is Zamfara state adjacent to site 7. The total area shown is about 10 ha. The length of the scale marker is 100 m. Even in 2013 it is a completely non - sawah field. In 2014, sawah system developemnt is progressing all over the area (mean plot size is 140m^2).

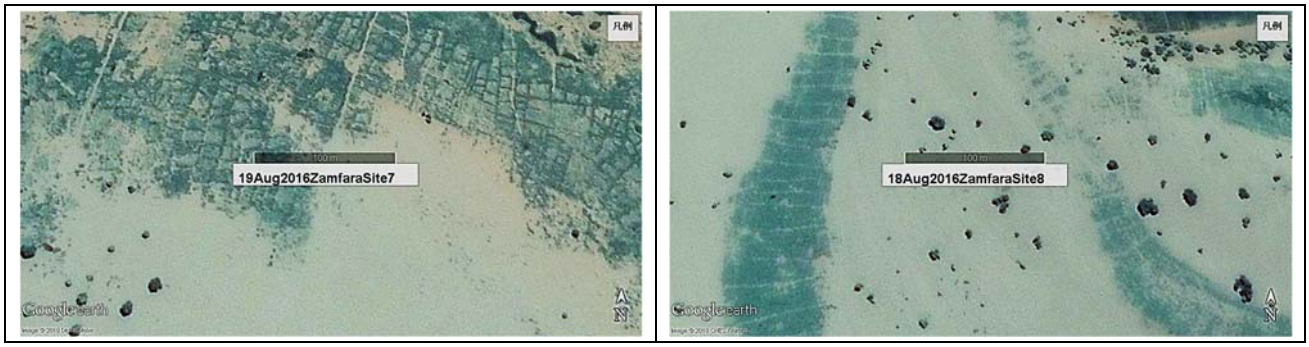

Figure 49. Google earth image on August 2016 showing the inundation of sawah systems of the Site 7 (Fig. 47) and Site 8 (Fig. 48). In these two sites, sawah system development progressed almost entirely by 2014. As shown in the figure 49, flood damage occurred in August 2016. Both sites are flooded over the entire area, but the bunding system of the sawah plots of relatively high specific height are clearly recognized. The average river slope is less than 1/1000, and in the usual floods of this degree, the sawah systems are not destroyed It is considered that sustainable management of sawah systems developed by farmers' self-help efforts will not be not so difficult.

7. The Rima River flood plain from the Zamfara River junction to the Niger River

7-1. Sangelu and Suru Region: flood plains where the impact of Sawah Technology is the most Prominent: 20,000 ha

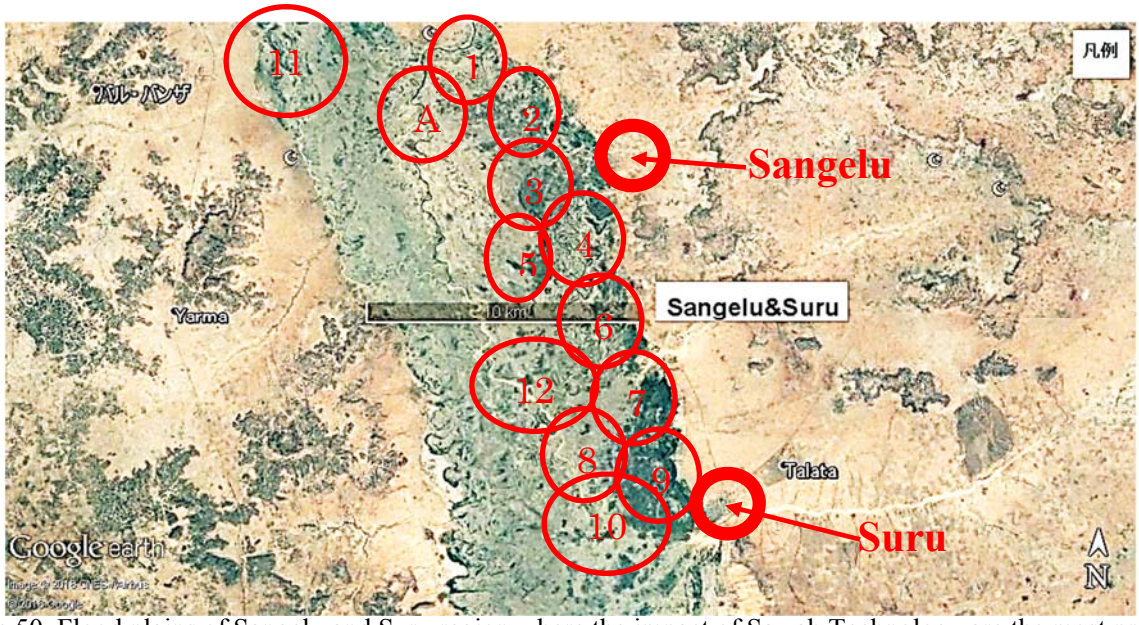

Figure 50. Flood plains of Sangelu and Suru region where the impact of Sawah Technology are the most prominent. This Google earth image shows the flood plains of the Rima river immediately after joining the Zamfara river from (A) and (11) as well as ①-⑤ near Sangelu town. The ⑥, ⑦ and (12) are in-between Sangelua and Suru. The ⑧-⑩ are in the vicinity of Suru town. The scale marker length in the figure is 10 km. The area of the floodplain in this picture is about 20,000 ha. The following Figure 50-63 show the explosive progress of the sawah system platform in this flood plains between 2010 and 2016.

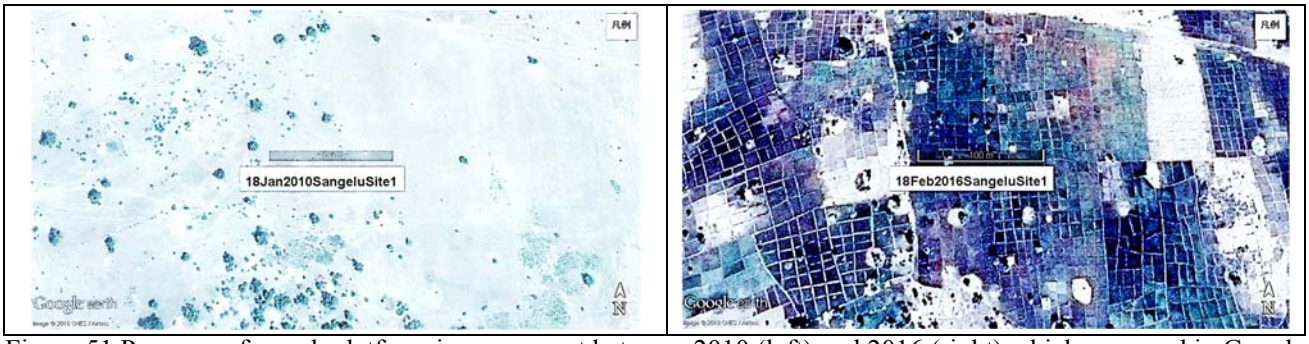

Figure 51.Progress of sawah platform improvement between 2010 (left) and 2016 (right) which appeared in Google image near Site 1 in the Sangelu area of of the Rima River floodplain shown in Figure 50. The area shown is about 10 ha. The scale marker is 100 m. In 2009, almost 100% of land are covered with non sawah field. In 2016, more than 90% land is covered with sawah system (mean sawah plot size is 100m^2).

Figure 52.Progress of sawah platform improvement between 2010 (left) and 2016 (right) which appeared in Google image near Site A in the Sangelu area of of the Rima River floodplain shown in Figure 50. The area shown is about 10 ha. The scale marker is 100 m. In 2009, almost 100% of land are covered with non sawah field. In 2016, more than 90% land is covered with sawah system (mean sawah plot size is 200m^2).

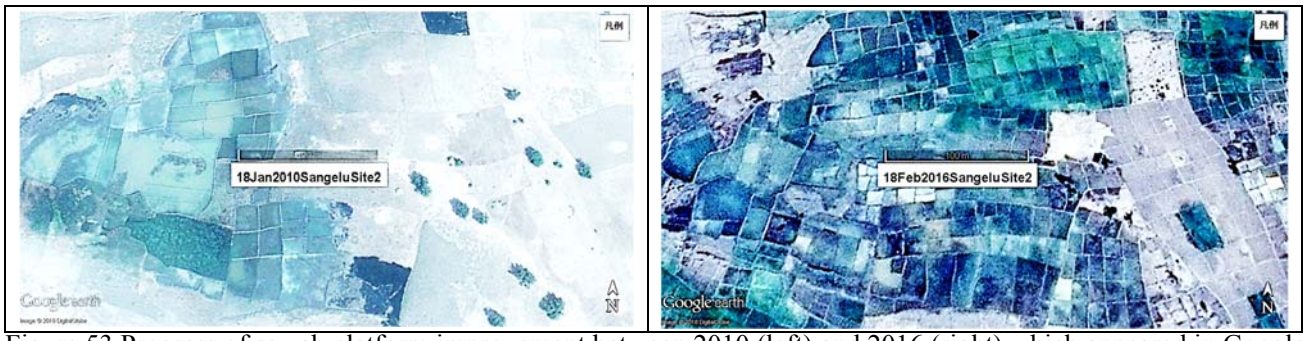

Figure 53.Progress of sawah platform improvement between 2010 (left) and 2016 (right) which appeared in Google image near Site 2 in the Sangelu area of of the Rima River floodplain shown in Figure 50. The area is about 10 ha. The scale marker is 100 m. In 2009, 10-20 % land have sawah plot like compartment in the depression. In 2016, more than 90% land is covered with sawah system (mean sawah plot size is 180m^2).

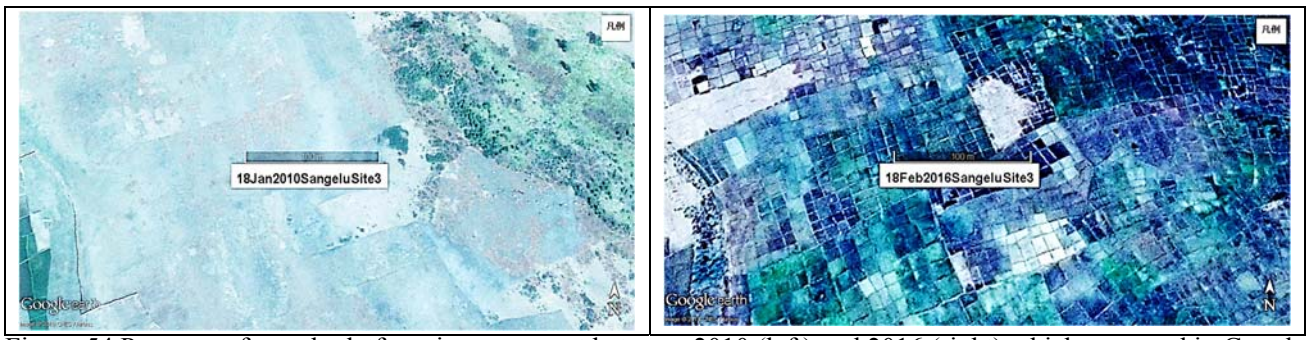

Figure 54.Progress of sawah platform improvement between 2010 (left) and 2016 (right) which appeared in Google image near Site 3 in the Sangelu area of of the Rima River floodplain shown in Figure 50. The area shown is about 10 ha. The scale marker is 100 m. In 2009, 100 % land have no sawah system. In 2016, 100% land is covered with sawah system (mean sawah plot size is 140m^2).

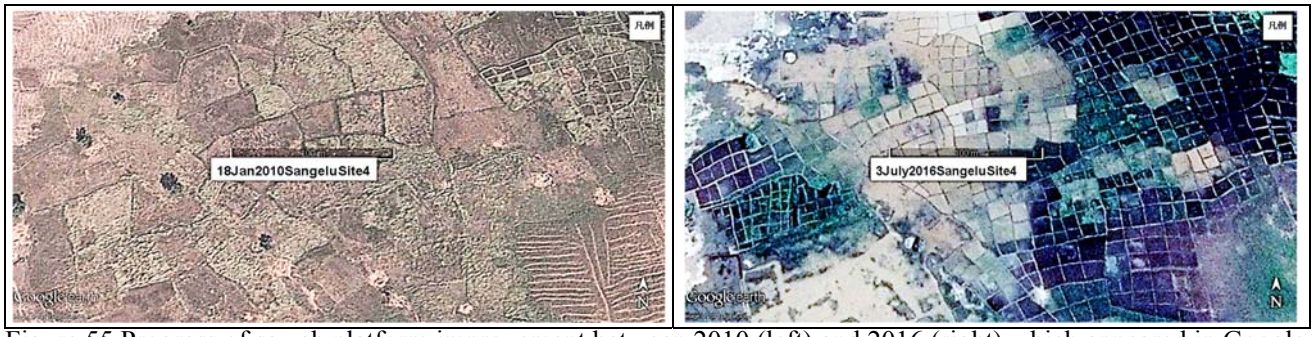

Figure 55.Progress of sawah platform improvement between 2010 (left) and 2016 (right) which appeared in Google image near Site 4 in the Sangelu area of of the Rima River floodplain shown in Figure 50. The area is about 10 ha. The scale marker is 100 m. In 2009, 90 % land have no sawah system and 10 % land have sawah plot like compartment. In 2016, more than 90% land is covered with sawah system (mean sawah plot size is 200m^2).

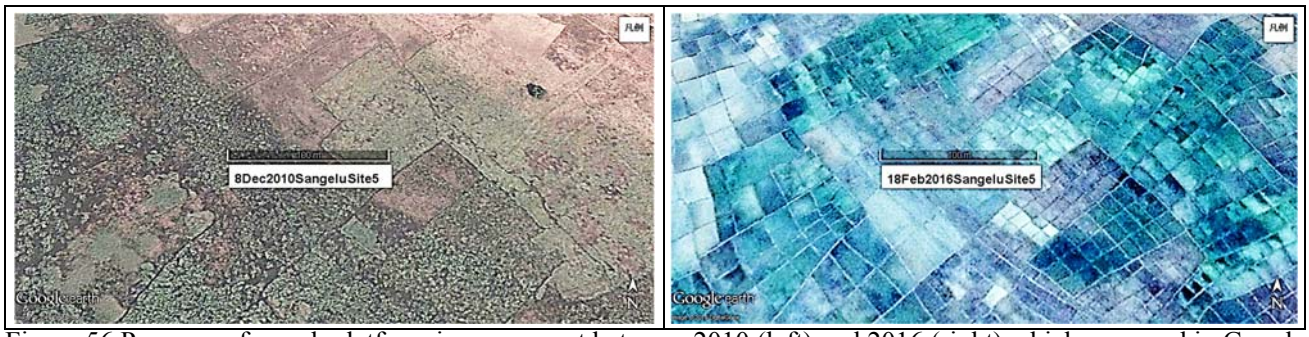

Figure 56.Progress of sawah platform improvement between 2010 (left) and 2016 (right) which appeared in Google image near Site 5 in the Sangelu area of of the Rima River floodplain shown in Figure 50. The area is about 10 ha. The scale marker is 100 m. In 2009, 100 % land have no sawah system. In 2016, 100% land is covered with sawah system (mean sawah plot size is 300m^2).

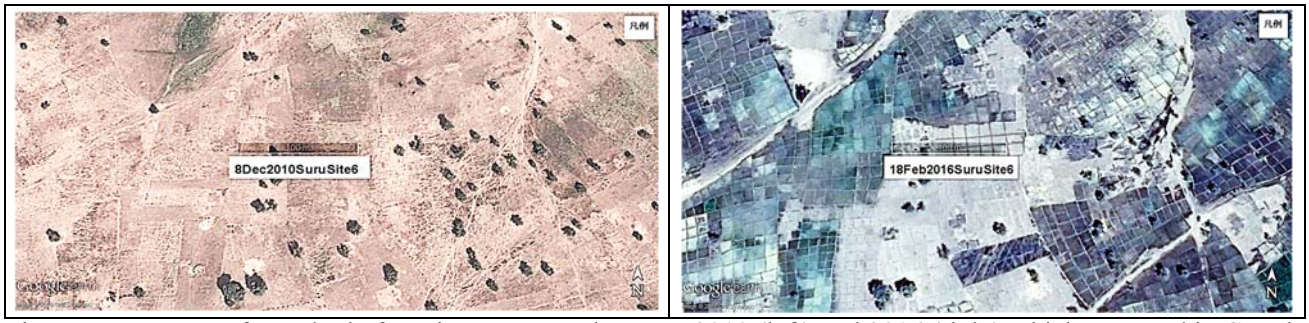

Figure 57.Progress of sawah platform improvement between 2010 (left) and 2016 (right) which appeared in Google image near Site 6 in-between Sangelu and Suru area of of the Rima River floodplain shown in Figure 50. The area is about 10 ha. The scale marker is 100 m. In 2009, 100 % land have no sawah system. In 2016, 90% land is covered with sawah system (mean sawah plot size is 120m^2).

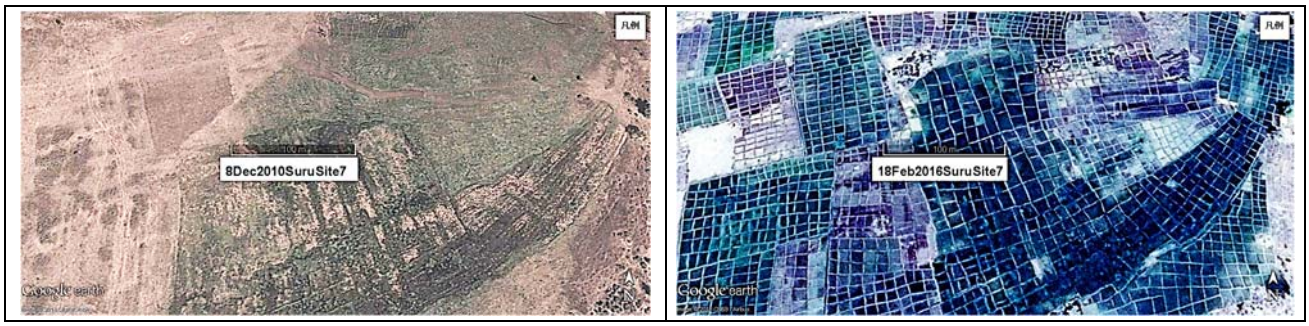

Figure 58.Progress of sawah platform improvement between 2010 (left) and 2016 (right) which appeared in Google image near Site 7 in Suru area of of the Rima River floodplain shown in Figure 50. The area is about 10 ha. The scale marker is 100 m. In 2009, 100 % land have no sawah system. In 2016, 100% land is covered with sawah system (mean sawah plot size is 110m^2).