# FIX THE DPI

That is very important when using a photo camera. Another important aspect is that you should keep a constant focal distance for all pages. Fit the page a good as possible with low margins. Another thing to do is change the image format to a lossless one. You'll need XnViewMP software installed. Launch it, browse to your scanned images and select (click) one. Look at the **Info** box in the bottom left corner.
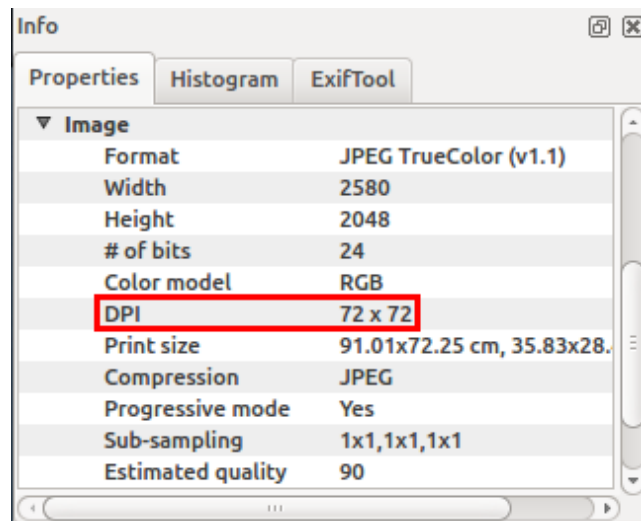

XnViewMP image information

Assuming a 5.3 MP photo. Just look at the Print size values... But you know you made a photo of an A4 paper. Looking at the photo, you left a 2 cm margins on left and right. So width should be $21 + 2 + 2 = 25$ cm. Our photo width is 72.25 cm (assuming portrait). So, the real DPI is (72.25 / 25) * 72 = 208 DPI.

$$RealDPI = \frac{PrintSize}{RealSize} \times CurrentDPI$$

But you want to have a 300 DPI image. This means you'll scale your image by

(300 / 208) * 100 = 144 %. This is the only operation that changes actual image

data.

Select all your images in XnViewMP browser and press $\boxed{\text{Ctrl+U}}$ or go to **Tools -**

Batch Convert. Select the **Actions**tab. Add the following actions:
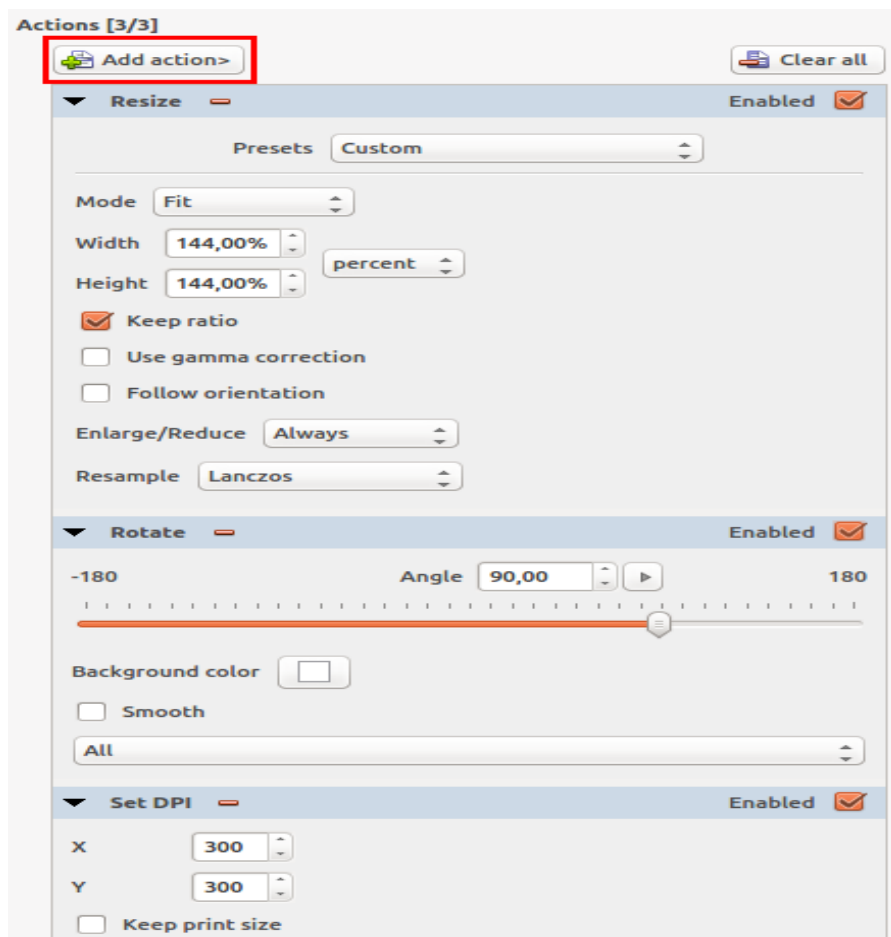
Actions configuration

Note that order matters. First we resize the image with Lanczos algorithm so any future processing loss of information will affect the bigger image. Rotate only if needed. At last change the DPI metadata. Do not check the **Keep print size**box. If needed, improve the image contrast and levels.

Go to **Output** tab and select TIFF format (it's lossless). Click the **Settings** button and make sure no compression is selected. This will eat your hard drive space (it's only temporary) but it will be very fast as processor load is low.

In the process I scaled the image by 144%. But the question is how much you can scale (actually how small can the original image be) to obtain satisfactory results? I've obtained great results with 150 DPI images turned to 300 DPI (so the percent is 200%) then again double to 600 DPI in the process of converting to 1-bit color. So if your scan has a real DPI lower than 150, delete it and do a better one.

There may be an extra step which is not shown in the screenshot. If the image is grayscale but it was scanned as color don't forget to change its color depth (**Add action - Image - Change color depth**).