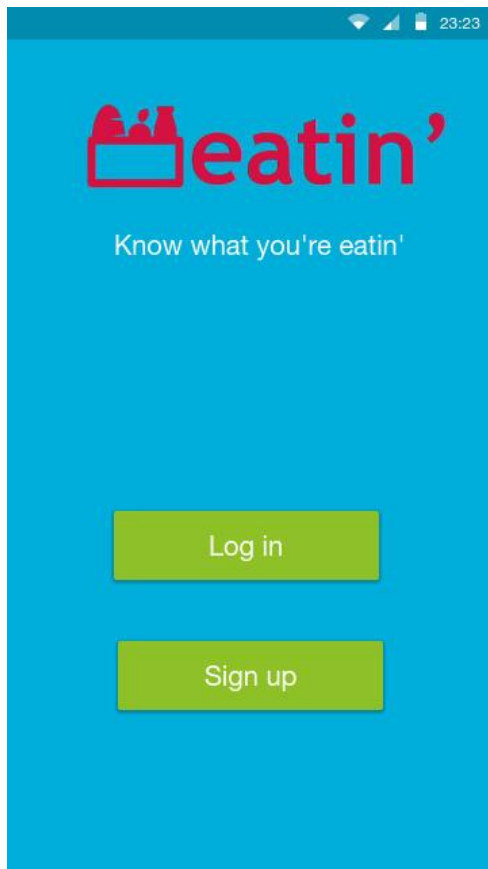# eatin'

# Know what you're EATIN'


# By

# Team Phoenix



eatin'

Know what you're EATIN'

# Introduction



Eatin' is an android application that not only provides details of food labels, nutrition, allergy intolerance and biodegradable packaging of the packaged food but also tracks the origin of ingredients that go into its production, using Blockchain to store digital certificate, Image processing and data analytics. We integrate several APIs to develop the front-end of the application and to provide the various functionalities to the end-users.

# Problem

You all must have noticed that we pay atleast 4 times the price for an organic food. For instance, compare the price of an organic oil with the sunflower oil that we get in a supermarket. Have you ever wondered, how we can trust the packaged product that is labelled as "organic" is actually "organic"? And is worth the price we pay for it?

Many people don't know the true meaning of the word "organic." Some take it to mean natural, pesticide-free and local. Others take it to mean certified to the utmost degree.

Here's what it means to the United States Department of Agriculture, and for our purposes, the REAL definition of organic:

"*Organic is a labelling term that indicates that the food or other agricultural product has been produced through approved methods that integrate cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity. Synthetic fertilizers, sewage sludge, irradiation, and genetic engineering may not be used.*" [1]

There are 14 things that organic companies does not want their customers to know. Those are listed below [1]:

1) Pesticides are allowed in organic production.
2) **The company/brand seeking organic certification pays the accrediting company.**
3) **Two of the three major organic certifying companies are for-profit. Only one organization is non-profit.**
4) **The actual certification to become organic, and follow-up inspections of companies certified organic, is often outsourced to a third-party.**
5) **The National Organic Program (NOP) do not certify or inspect companies/foods for certification.**
6) Some "natural" chemicals used in organic farming are carcinogenic.
7) Organic pesticides aren't always as effective as synthetic, and may require more application in order to achieve the same protection.
8) There are 35 non-synthetic, non-organic substances allowed as ingredients in or on processed products labelled as "organic."
9) There are 43 synthetic, non-organic substances allowed as ingredients in or on processed products labelled as "organic."
10) Over 45 non-organically produced ingredients are allowed as ingredients in or on processed products labelled "organic" when the ingredient is not commercially available in organic form.
11) Only 95% of a food item is required to be organic in order to be labelled "organic."
12) Organic foods may be cross-contaminated with conventional versions of the same food.
13) Organic foods may be "watered down."
14) Annual sales of organic food totals about $27 billion each year, yet there are only 27 employees in the NOP.

According to the American journal of clinical nutrition, 83% of people look at the details on the food labels of the packaged food, however, only 11% are able to understand and make use of it [2].

Marketing week provides the below stats in their blog [3]:

Companies share 91% of true information about food labelling standards and nutritional information with both marketing and product development teams, only half make it available to sales teams and at the end only 7% reached the consumers like us. Also, explained in the below chart.

Comapnies share 91 % to marketing and development teams

45% to sales teams

30% to agencies

28% to suppliers

7% to public
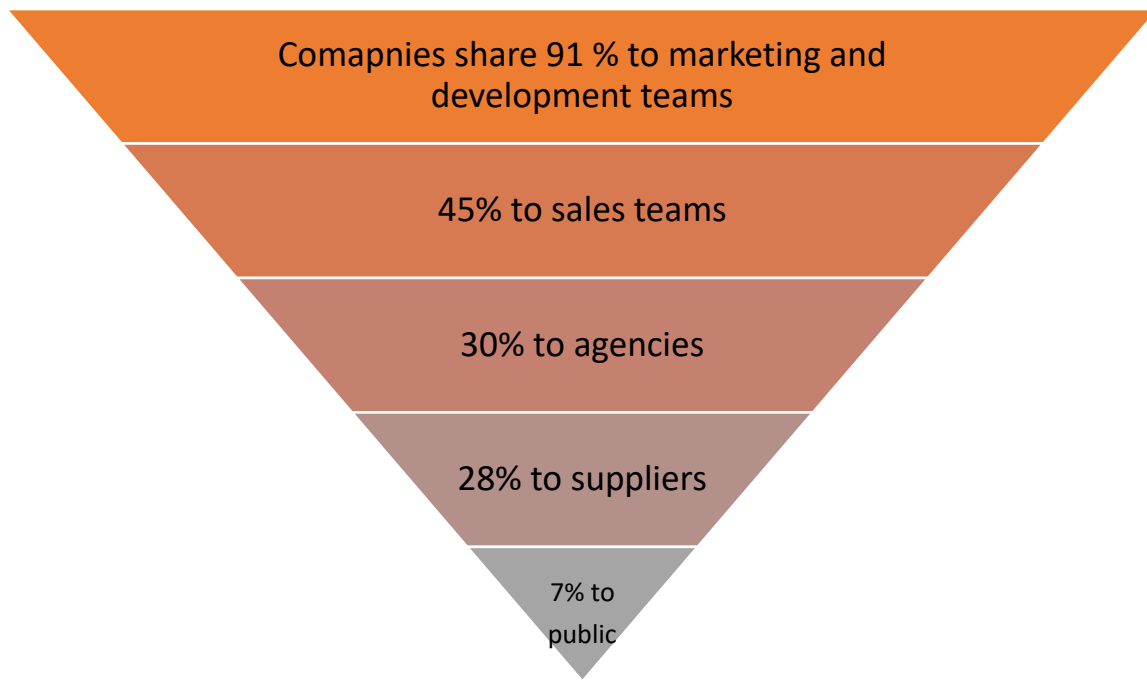
## Customer

Every person who has the awareness and education and is willing to know the origin of ingredients of food items, and to understand the data about the food labels, nutrition, etc. of the packaged food.

The research shows that the consumers are interested to know this information as it would help them understand the quality of the product, to use it as a way of accessing the environmental impact and so on [4].

Confirming from the BEUC's survey conducted in various countries within EU, it clearly shows that there is high demand amongst the public to know the origin of ingredients of their packaged food. This demand cannot be ignore any longer and therefore, origin labelling is becoming popular across many brands [4].
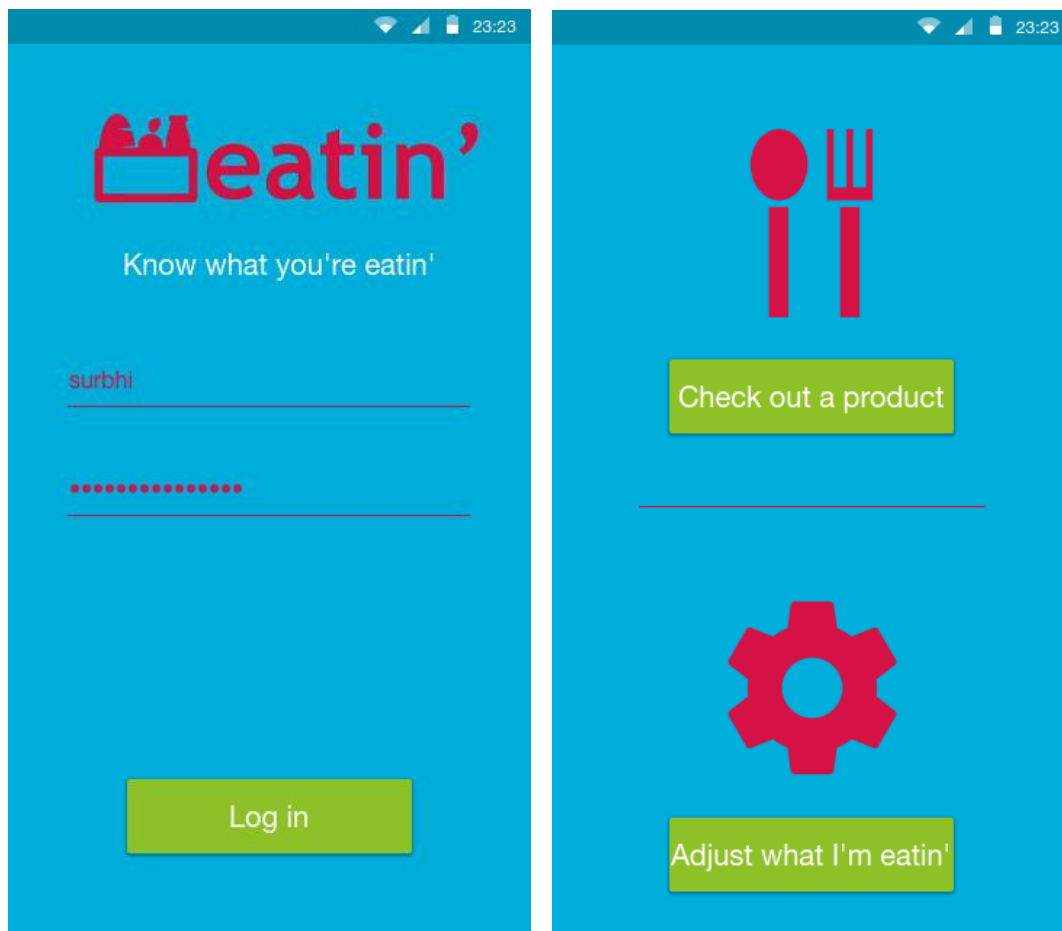
## Solution

We utilise the power of various technologies to provide the solution. The proposed solution is an android application that has the following features:
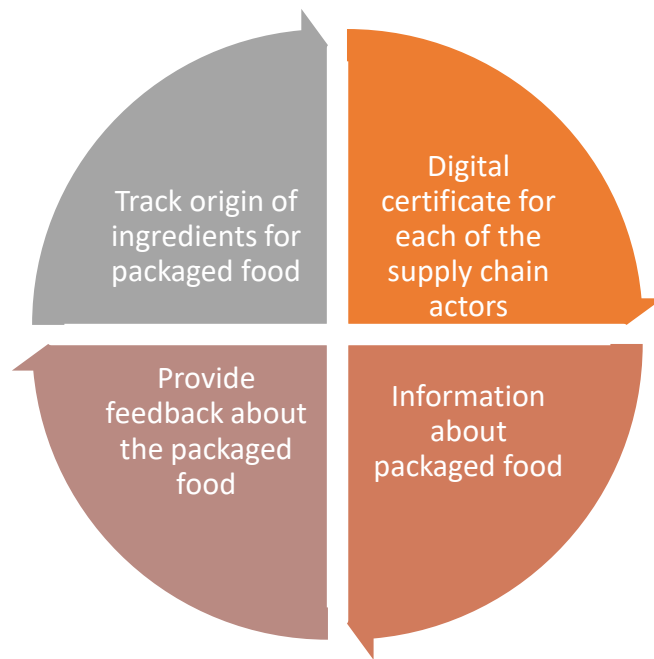
Below is the screenshot from the prototype of the application we developed.
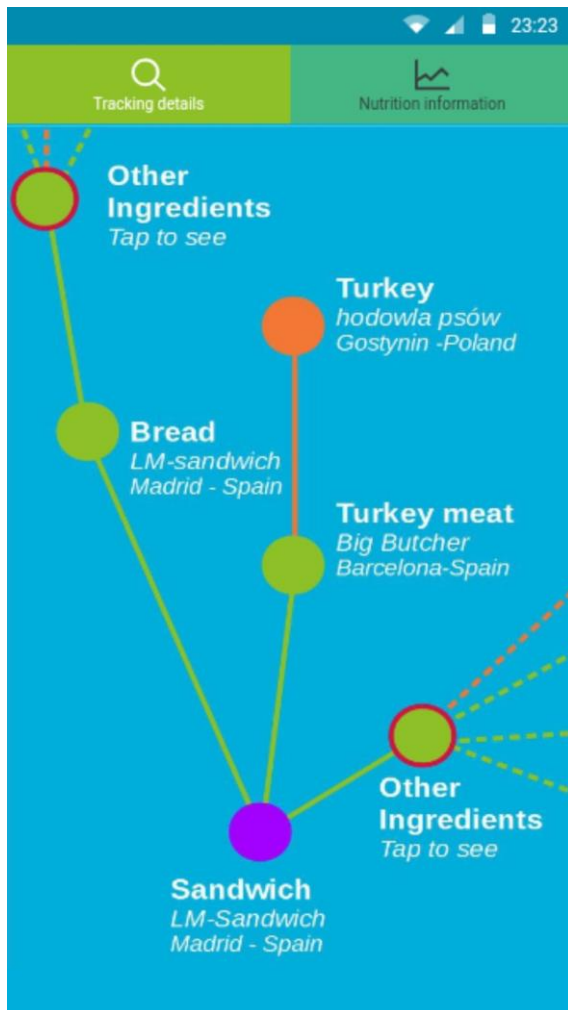
User has to log in the application. After login, the main menu appears.

User clicks the photo of the product.



The application will automatically show the tracking details of the origin of ingredients of all the products. Also, it would show the nutrition and allergy related information in another tab.

# Technologies

## Blockchain

Eatin' is supported via private Blockchain, in this case we use hyperledger fabric API by KairosDS.

**How Blockchain is integrated**?

First, generate the electronic file of a physical certificate, in this case we call it as "certificate of assurance" between us and the producer. Attach this file with the other related data and upload it into the database. Now, calculate the electronic file for its hash value. Finally, store the hash value into the block in the chain system. So, the next time producer puts any information about the origin of food items, all others over the blockchain can agree to it if that producer has our certificate. This way, **we built the network of trust among the producers**. And with the eatin' application, consumers can look for the product and know the origin of food at all stages of supply chain.

**Why Blockchain**? Simply because of its unmodifiable properties, that would help develop trust between different partners and consumers. It also reduces the risk of loss of certificates as they are digital.

We followed couple of decision models to come to the conclusion that we need a private Blockchain in the application [5]. Below we present the same.
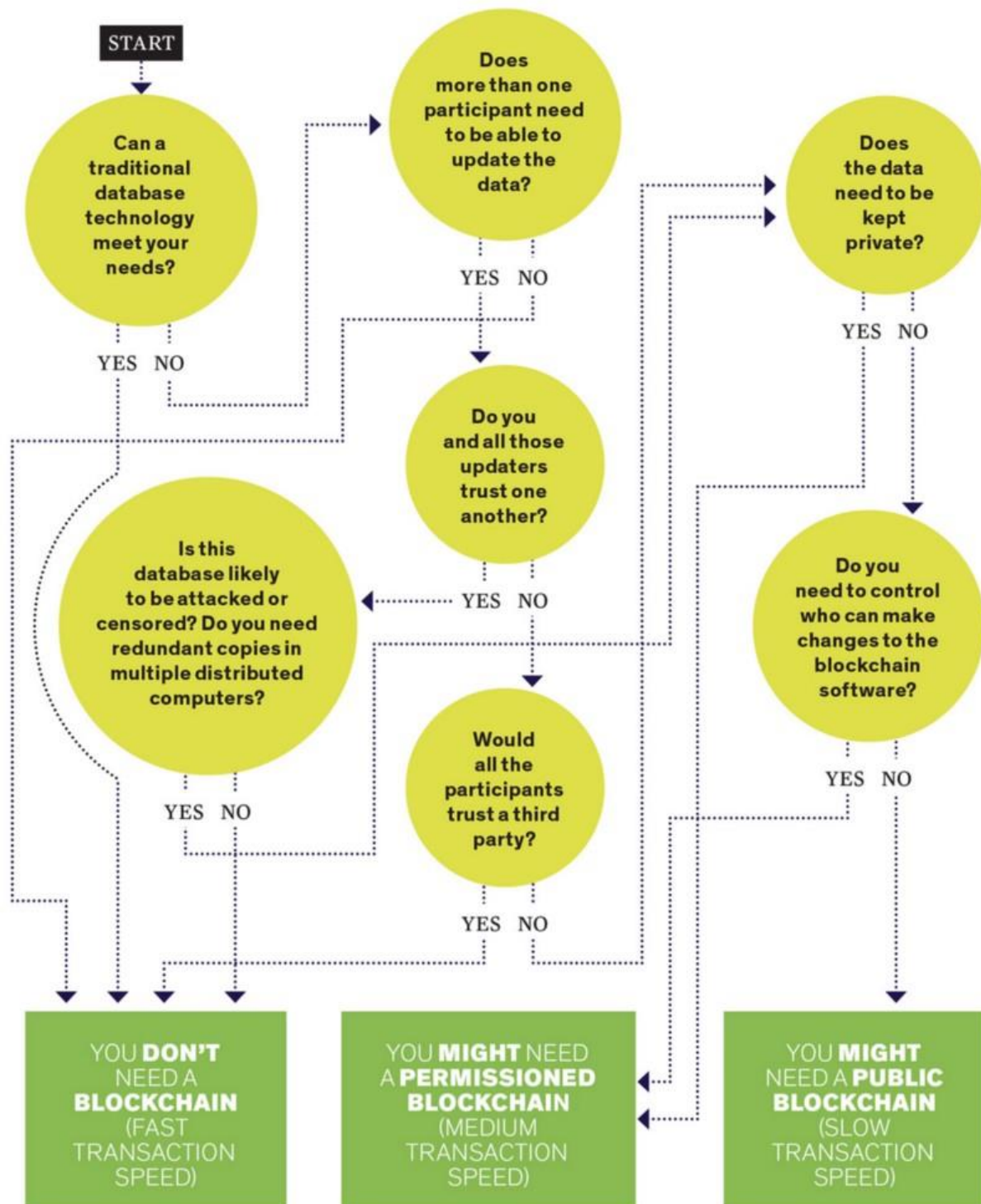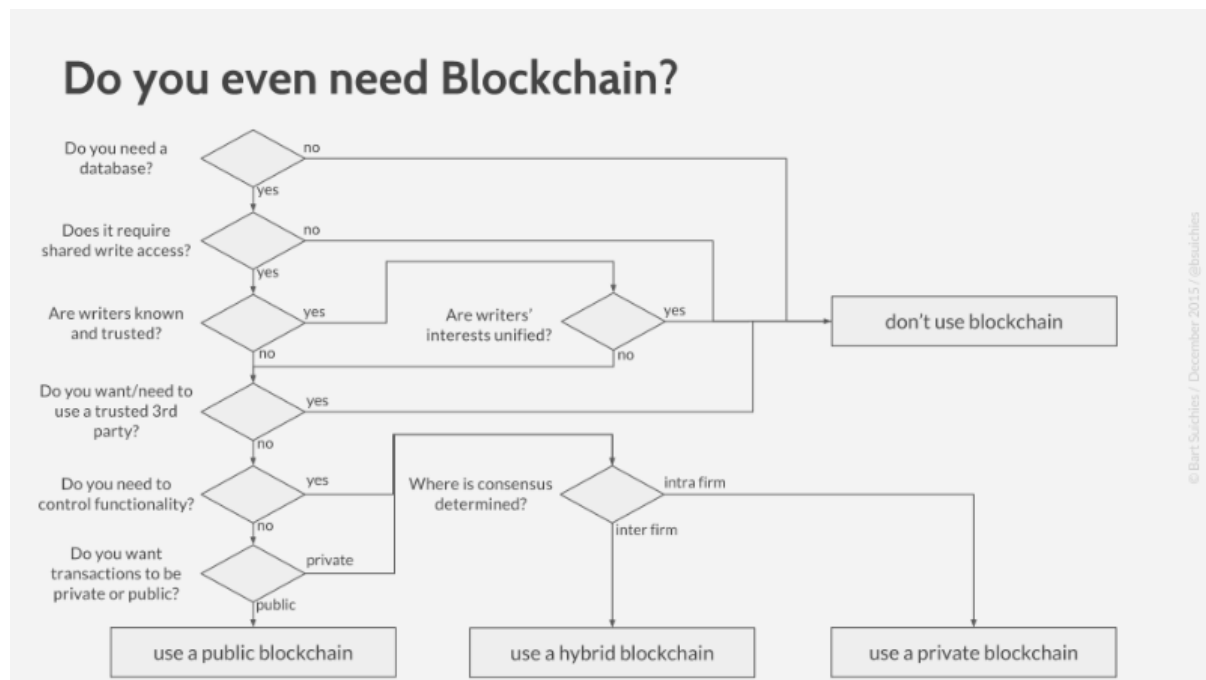
## Image Processing

Eatin' also utilizes image processing techniques to recognize products. We use Android Mobile Vision API to accomplish our task.

**Why not QR code to recognize products**? Simply because for QR codes, the packaging company will have to modify their packaging and would lead to additional cost, which in the end consumers will have to pay. Instead, if we use image processing to recognise products, we help both the producers and the consumers to save that additional expense.

We have developed a basic version of the proposed implementation using the Google samples android vision code [6, 7].

## Data Analytics

With the interactive mobile platform, we ask users to provide feedback of the products. We perform data analytics using Spark API.

**Why Data Analytics**? Simply because in this way we can provide the useful information and statistics to the companies/ producers that can benefit from it. They can improve or customize their products according to the public demand to increase their sales and profit.

# The Road Ahead …

We are proud to venture in this area, as we also contribute to six of the UN Sustainable development goals 2020 as shown below [8].



This application could be expanded for many more purposes. Some of them could be:

1) Recommendations based on their profile
2) Possibility to do customized settings for individual user
3) Expanding it for the global supply chain

# References

[1]https://dontwastethecrumbs.com/2015/03/14-facts-the-organic-industry-doesnt-want-you-to-know/

[2] https://academic.oup.com/ajcn/article/83/5/1235S/4649742

[3] https://www.marketingweek.com/2014/03/19/consumers-confused-over-food-labelling/

[4] https://www.beuc.eu/publications/2013-00043-01-e.pdf

[5]https://medium.com/@sbmeunier/when-do-you-need-blockchain-decision-models-a5c40e7c9ba1

[6] https://github.com/googlesamples/android-vision/

[7]https://github.com/googlesamples/android-vision/tree/master/visionSamples/ocr-reader

[8] https://www.un.org/sustainabledevelopment/