In [8]:
```
import keras
from keras.preprocessing.image import ImageDataGenerator
```

In [14]:
```
from keras.models import load_model
from keras.layers import Lambda
import tensorflow as tf
```

In [22]:
```
tf.keras.preprocessing.image_dataset_from_directory(
    directory="C:\\Users\\Akash\\Downloads\\Dataset",
    labels="inferred",
    label_mode="int",
    class_names=None,
    color_mode="rgb",
    batch_size=32,
    image_size=(256, 256),
    shuffle=True,
    seed=None,
    validation_split=None,
    subset=None,
    interpolation="bilinear",
    follow_links=False,
    crop_to_aspect_ratio=False,
)
```

```
Found 558 files belonging to 1 classes.
```

Out[22]:
```
<BatchDataset element_spec=(TensorSpec(shape=(None, 256, 256, 3), dtype=tf.float32, name=None), TensorSpec(shape=(None,), dtype
=tf.int32, name=None))>
```

In [58]:
```
tf.keras.preprocessing.image.load_img(
    path="C:\\Users\\Akash\\Downloads\\Dataset\\Dataset\\train_set\\forest\\with_fire (1).gif", grayscale=False, color_mode="rgb"
)
```

In [10]:
```
train_datagen=ImageDataGenerator(rescale=1./255,shear_range=0.2,rotation_range=180,zoom_range=0.2,horizontal_flip=True)
test_datagen=ImageDataGenerator(rescale=1./255)
```

In [21]:
```
#: Applying ImageDataGenerator functionality to trainset.
x_train = train_datagen.flow_from_directory(r'C:\Users\Akash\Downloads\Dataset\Dataset\train_set',
                                            target_size = (128,128),
                                            batch_size = 32,
                                            class_mode= 'binary')
```

```
Found 436 images belonging to 2 classes.
```

In [22]:
```
x_test = test_datagen.flow_from_directory(r'C:\Users\Akash\Downloads\Dataset\Dataset\test_set',
                                          target_size = (128,128),
                                          batch_size = 32,
                                          class_mode= 'binary')
```

```
Found 121 images belonging to 2 classes.
```

In [23]:
```
from keras.models import Sequential
from keras.layers import Convolution2D,MaxPooling2D,Dense,Flatten
import warnings
warnings.filterwarnings('ignore')
```

In [24]:
```
model = Sequential()
model.add(Convolution2D(32,(3,3),input_shape=(128,128,3),activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))
model.add(Flatten())
model.add(Dense(units=256,activation='relu'))
model.add(Dense(units=1,activation='sigmoid'))
model.summary()
```

In [32]:
```
model.save("forest1.h5")
```

In [81]:
```
#import load_model from keras.model
import matplotlib.pyplot as plt
from keras.models import load_model
#import image class from keras
from keras.preprocessing import image
#import numpy
import numpy as np
from PIL import Image
#import cv2
import cv2
from PIL import Image
from keras.utils import img_to_array
```

In [82]:
```
model = load_model("forest1.h5")
```

In [83]:
```
def prediction(img_path):
    i = cv2.imread(img_path)
    i = cv2.cvtColor(i, cv2.COLOR_BGR2RGB)
    img = Image.open(img_path)
    img = img.resize((128,128))
    x = img_to_array(img)
    x = np.expand_dims(x,axis=0)
    pred = model.predict(x)
    plt.imshow(i)
    print("%s"%("FOREST FIRE DETECTED! SMS SENT!" if pred==[[1.]] else "NO FOREST FIRE DETECTED"))
```