Société Internationale de Plantations d'Hévéas

CLIMATE RISK ASSESSMENT AND ITS IMPACT ON RUBBER CULTIVATION

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1. POTENTIAL CLIMATE CHANGE-RELATED RISKS FOR NATURAL RUBBER PRODUCTION

- The impact of climate change on natural rubber production is an issue that has formed the subject of several workshops and studies, but the scientific community has to date come up with more hypotheses than established facts.
- Rubber cultivation is particularly resilient; it has been able to adapt to very different climate and environmental conditions.
- The following main risks have been identified, the occurrence or severity of which, while not quantified, may be amplified by current or future climate changes:

    - In the short term, the main threat certainly relates to the risk of epidemics, with the new emergence of leaf diseases and pathogens that may affect major production zones that have so far been spared. This risk is particularly high in southeast Asia, which represents nearly 90% of the world's natural rubber production, with an especially high concentration in southern Thailand. Even minor climate changes can promote the development of these parasites and underscore an already-present fragility

    - The appearance and increase of widespread violent cyclonic activities can also generate wind damage and cause localized destruction of the rubber forest, which numbers over 5 billion trees globally

    - Over longer timescales, the forecast climate changes will probably change the map of the zones suitable for rubber cultivation. Regions said to be suboptimal, with lower average temperatures (below 25°C) and/or less rainfall (less than 1,500 mm), in which rubber cultivation has seen major development over the last two decades, will probably be the hardest hit and will see their marginal nature reinforced. For example, this is the case for the northern and northeastern regions of Thailand, southern China, or the upper Vietnamese plateau, where rubber cultivation could eventually become uneconomic

    - One last risk, still poorly assessed, concerns the deleterious effect that a rise in the average temperature could have on rubber yields. While the increase in atmospheric CO2 content may stimulate the photosynthetic activity of crops in general, and rubber, conversely, the increase in temperatures generates an increase in the evapotranspiration phenomenon that can promote water stress and affect agricultural yields.

- Most importantly, and over our timescales (30 years), we do not envisage a massive migration of rubber cultivation zones or a major impact on their production levels, even though some regions may be affected locally
- This assessment takes the most direct potential environmental impacts into consideration and does not cover wider issues such as competition for access to cultivable land or the increasing scarcity of labor that could also be affected by climate change.

2. SIPH GROUP'S SOLUTIONS TO CLIMATE RISKS AND ACTIONS UNDERTAKEN

SIPH has long been undertaking concrete actions to reduce the risks by diversifying its countries of operation environment in west Africa.

For over 30 years, the Group, along with its scientific partners, has also led programs to select and improve varieties, aiming to develop strains that are more resistant to disease and better adapted to the new climatic circumstances. Once assessed, these varieties are made available to plantation owners in all production zones

With its plantation owner partners, the Group is developing and promoting rubber cultivation in favorable zones only, avoiding suboptimal and more marginal areas. SIPH teams develop and assist in promoting more resilient agricultural practices, to preserve soil quality and life by maintaining a permanent plant cover.

The Group follows the climate and epidemiological changes in the production basins, directly on the plantations it assists, and in partnership with its natural rubber suppliers, as well as research stakeholders within the IRRDB (International Rubber Research and Development Board)

The Group develops and offers products and services that are always better performing and aiming at maximum efficacy from the material used. The architecture of Michelin tires - which are amongst the lightest on the market - and their long-life span allows for meeting the need for sustainable mobility without increasing the pressure on raw materials.

3. ALTERNATIVES TO NATURAL RUBBER

The alternatives known to date are not capable of replacing natural rubber.

Synthetic rubbers have properties that are often complementary to those of natural rubber; they play a major role in tire performance and contribute to reducing natural rubber consumption, but they cannot be substituted for all uses. Furthermore, it is currently a material that comes mainly from the petrochemical industry and is non-renewable.

The production of latex has been described in over 20,000 plants, but the alternative sources of natural rubber, in particular the Russian dandelion and Guayule, which are among the most developed, are not currently able to sustainably produce large quantities of rubber, unlike the rubber tree:

Their yields are significantly lower than that of the rubber tree; the areas cultivated must be increased by 3, 4 or 5 times to produce the same quantity of rubber.

The environmental footprint of these two crops is less favorable than that of the rubber tree. Guayule must be watered to get a decent production, and the extraction of its rubber requires the major use of chemical solvents. Dandelion cultivation may compete with food production, and the need for the plant to be uprooted also generates a risk of pollution and a loss of soil fertility

4. MEASURES IMPLEMENTED TO OFFSET THE IMPACT OF ANY NATURAL RUBBER SUPPLY DEFICIT DUE TO CLIMATE CHANGE

The Group has taken various actions:

- The diversification of supply sources; partnerships with its suppliers and the holding of shares in rubber plantations, which guarantee a non-exclusive yet preferential sourcing for the Group,
- The development and promotion of new varieties and the most resilient agricultural practices amongst the industry's stakeholders,
- The development of high-performance products and services that aim for maximum efficacy from the materials used, pursuing retreading options and increasing the development of recycling.

5. IMPACTS THAT COULD BE LINKED TO CLIMATE CHANGE

To date, we do not have sufficiently robust studies to confirm the impacts linked to climate change, however, climate risks have been seen: extended rainy seasons, and severe droughts, without any year being the same!

A leaf disease appeared in 2017 in Indonesia and has been propagated in other areas of the subregion, significantly impacting the condition of rubber plantations and their productivity; scientific studies have not yet allowed a unanimous verdict on the suspected pathogenic fungus, or for formally linking this emergence to a change in climate conditions, even if a causal connection is highly likely.

6. EFFECTS ON THE RUBBER PLANTATIONS OF FREQUENCY AND INTENSITY OF EXCEPTIONAL WEATHER EVENTS - FLOODS, FOREST FIRES, CYCLONES, AND PROLONGED DROUGHT

Floods: while these remain limited, the effect on the crop is restricted to a loss of a few days' production. A permanent increase in the water and groundwater levels in some plots could render the land unsuitable for cultivation.

Fire: this leads to the complete destruction of young trees that must be replanted; its impact is generally less serious on mature trees.

Cyclones, typhoons: these cause wind damage and destroy entire plots, which must then be restored. Plantations are generally developed in areas with little wind and outside of cyclone corridors, as wind damage is already a major risk that progressively alters the population over a 30- year life cycle. Regions that would see an increase in the occurrence of these phenomena would simply become unsuitable for rubber cultivation.

Prolonged drought: rubber copes with a dry season and water stress lasting 3 months; between 4 and 5 months, the production potential is affected, and beyond this the crop's sustainability is at risk. Limited droughts affect the year's growth and production; if these are repetitive then the region's potential is affected, with production that may be diminished by 20-30%, and in the most extreme cases reducing the viability of rubber cultivation.

7. RUBBER CULTIVATION BENEFICIAL TO THE CLIMATE

Yes, provided it complies with the recommended standards - no deforestation, no slash-and-burn or planting on steep slopes. Rubber plantations are dense forests that sequester carbon and play a positive role in climate regulation; they also contribute to maintaining soil quality and preventing erosion.

Bertrand VIGNES

CHIEF EXECUTIVE OFFICER