PROJECT DEVELOPMENT OF SPRINT -1

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protection SPRINT funds collaborative projects with many companies across the UK, the outcomes of many of these projects, and the missions of companies leading them, help to contribute to the UN's Sustainable Development Goals (SDGs). This was summarised in a previous report, that identified and summarised the most frequent Goals, directly and indirectly linked to SPRINT projects. The top 3 most frequent Goals were:

• SDG#9 Industry, Innovation, and Infrastructure

• SDG#12 Responsible Consumption and Production • SDG#13 Climate Action This report will summarise the SDG#13 and provides some examples of how SPRINT projects are supporting this Goal. Sustainable Development Goal SDG#13: Climate Action There is no country that is not experiencing the drastic effects of climate change. Its impacts upon the globe are ruthless and the recovery costs are countless. Due to changing weather patterns, sea levels are rising, weather events are becoming more extreme and greenhouse gas emissions are at their highest levels in history. As a result, flooding across India, Bangladesh and Nepal has affected 9.6 million people and 550 people died in 2020. Moreover, deforestation occurs simultaneously by anthropogenic activities and natural events, which release huge amounts of carbon dioxide that accelerates global warming. According to the United Nations Development Plan (UNDP), the annual average economic losses from climate-related disasters are in the hundreds of billions of dollars. This is not to mention the human impact of geo-physical disasters, which are 91 per cent climate-related, and which between 1998 and 2017 killed 1.3 million people and left 4.4 billion injured. Immediate action is required with efforts to integrate disaster risk measures, sustainable natural resource management and human security into national development strategies. Hence, these actions are possible through harnessing existing technologies, investments and collaborations of businesses. SPRINT Case Studies In the previous report about SPRINT and the SDGs, SDG#13: Climate Action appeared as the third most frequent Goal from the project lists contributing to strengthen resilience and adaptive capacity to climate related hazards and natural disasters, and mitigate the cost of climate action through sustainable management based on the Global Indicator Framework (GIF). Of the 87 projects investigated, a total of 21 projects were assessed to contribute directly or indirectly to SDG#13. Due to the space sector focus of the SPRINT programme, many of the funded collaborative projects are closely linked with harnessing innovative space technologies such as Earth Observation (EO), Sentinel 1 (Radar) and Sentinel 2 (Optical) which uses satellite imagery for a wide variety of applications such as forest change and land cover mapping. These technologies play a

central role in climate change monitoring, weather forecasting, disaster management, and search and rescue operations. Ecometrica Ecometrica is the global leader in downstream space information solutions. The company signed up to the national SPRINT programme to have access to expertise from the University of Surrey, one of Britain's top space research institutions. Ecometrica worked out to analyse satellite data for monitoring sustainable development goals and climate resilience. This project develops scalable methods to bring together Earth Observation data from different sources (both available Sentinel data and commercial products) to monitor vulnerability to, and recovery from natural disasters, specifically using the case of flooding in Mexico, and natural and man-made events in Brazil. Through this project, assessment on the risk of forest fires can be warned in advance to mitigate the impact of forest fire which is one of the main factors in forest degradation, and improve fire management regimes which is likely to be an essential component of climate changeresilience strategies. Moreover, tropical forests store large amounts of carbon dioxide which when mapping the details about the carbon storage capacity of tropical forest regeneration, will help tropical forest partners to locate the areas where forest and planting will be most effective at sequestering carbon, thereby acting to reduce climate change. Figure 1 Data analysis based on Earth Observation by Ecometrica According to the Global Indicator Framework, Ecometrica covers the following indicators: 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries 13.1.3 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies 13.2 Integrate climate change measures into national policies, strategies and planning The outcomes of the Ecometrica project could also make direct and indirect contributions to achieving other SDGs, including:

• Goal 1: No Poverty
• Goal 3: Good Health and Well-being
• Goal 4: Quality Education
• Goal 5: Gender Equality
• Goal 8: Decent Work and Economic Growth
• Goal 10: Reduced Inequality
• Goal 11: Sustainable Cities and Communities
• Goal 12: Responsible Consumption and Production

• Goal 15: Life on Land Previsico Flooding is the one of the extreme events caused by climate crisis. The importance of mitigation of its impacts and preparation for flooding is required for future resilience against natural disaster. The challenge with existing forecasting technologies is that because every storm is different, hourly changes in weather patterns can cause floods which are not detected using traditional forecasting approaches. However, Previsico has made a difference with a research project with SPRINT partner, the University of Leicester. Figure 2 Example of Previsico's flood forecasting programme Previsico is a global flooding forecasting company, which spun out of Loughborough University in 2019. The majority of its work is aimed at reducing the impact of flooding globally by delivering the absolute best flood forecasting technology to those who need it. Previsico signed up to the national SPRINT business support programme to further increase the accuracy of its flood

modelling techniques and commercialise its comprehensive flood management solution. The collaboration with the University of Leicester has resulted in more accurate and validated flood forecasts to its international customers, enabling them to respond to flood events in a targeted and efficient manner. According to the Global Indicator Framework, Previsico covers the following indicators: 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries 13.1.3 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies 13.2 Integrate climate change measures into national policies, strategies and planning The outcomes of the Previsico project could also make direct and indirect contributions to achieving other SDGs, including:

• Goal 1: No Poverty
• Goal 3: Good Health and Well-being
• Goal 8: Decent Work and Economic Growth
• Goal 9: Industry, Innovation, and Infrastructure
• Goal 10: Reduced Inequality
• Goal 11: Sustainable Cities and Communities

• Goal 15: Life on Land Conclusion The United Nations' Sustainable Development Goals are containing various issues around the world. In particular, SDG#13 was established to tackle global issues relating to the climate crisis. As extreme weather events and natural disasters cause enormous costs in economic, social and environmental terms, the efforts to mitigate the impacts through innovative technology become critical. Therefore, the technological approach should be more emphasised and partnerships should be encouraged between businesses and Higher Education Institutions to accelerate the invention of innovative technologies. Such technological support from SPRINT projects could allow sustainable solutions to become adapted from imagination to reality. Thus, people can be prepared for the disasters and living in more secure home environments