UPOV Seminar, Geneva
March 22, 2023

The importance of public-private collaboration to enhance application of biotechnology in plant breeding

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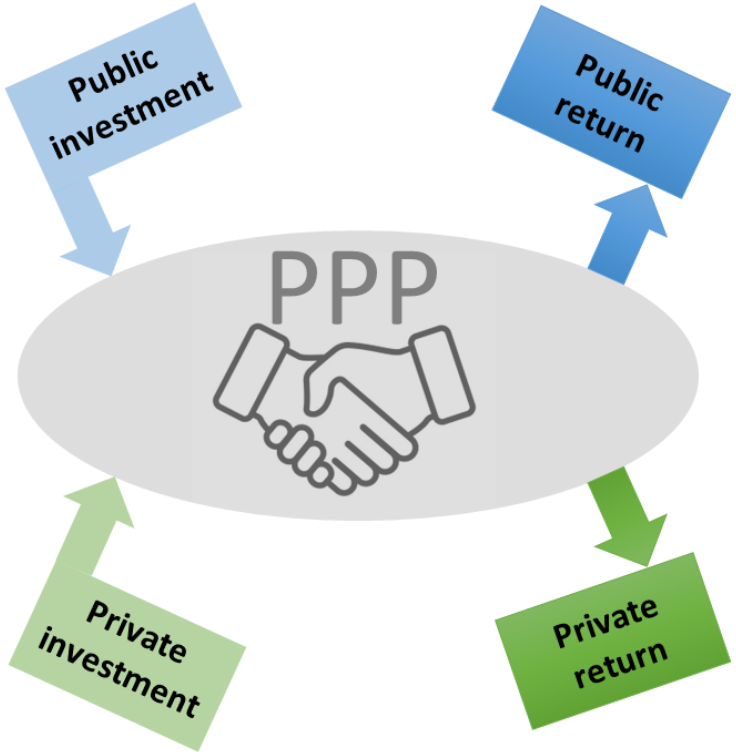
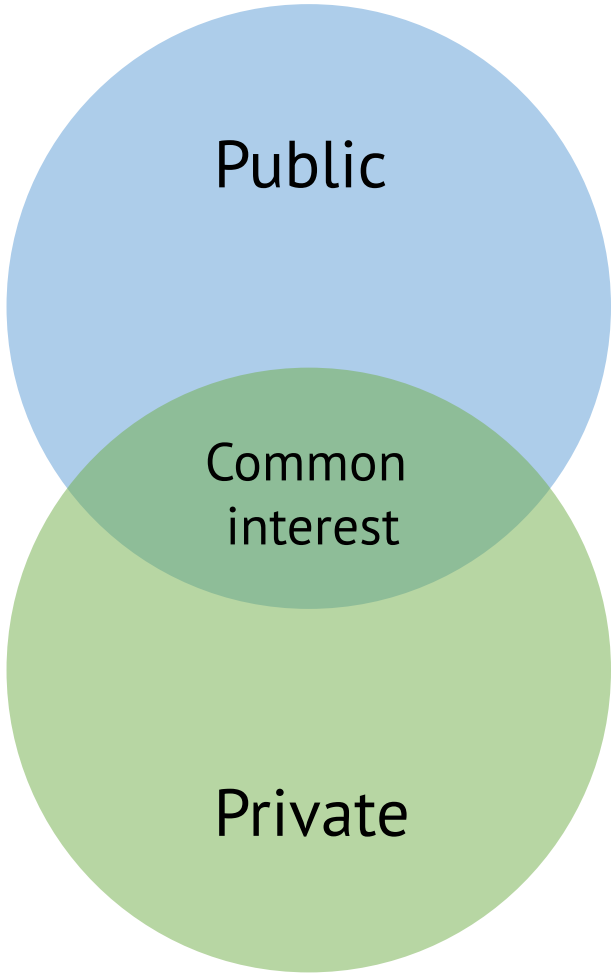
Public Private Partnership (PPP)

PPPa are a 'long' term collaboration between public sector (government) and the private businesses, where both parties share duties and responsibilities, and funds, to solve a common issue of interest…





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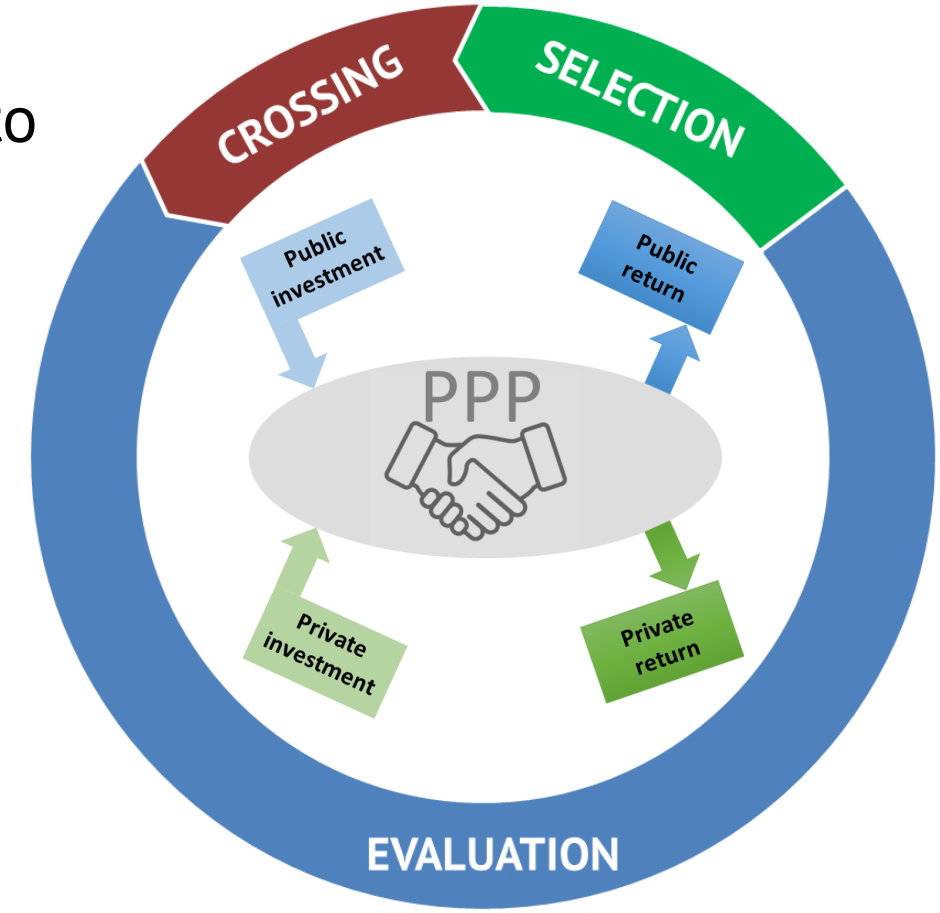
https://www.slideshare.net/mohanrajhorti/publicprivate-partnerships-198739700

https://farmingfirst.org/2012/02/public-private-partnerships-a-vital-mechanism-for-advancing-agricultural-innovation/

Public Private Partnership for plant breeding

- ✓ Plant breeding is one of the most sustainable way to improve food security and future challenges.
- ✓ Plant breeding is multidisciplinary and long-term operation/investment.
- ✓ Many challenges: genome complexity, multi-trait, G x E.
- ✓ Plant breeders always seek for methods that can increase their selection efficiency and accuracy at low cost.



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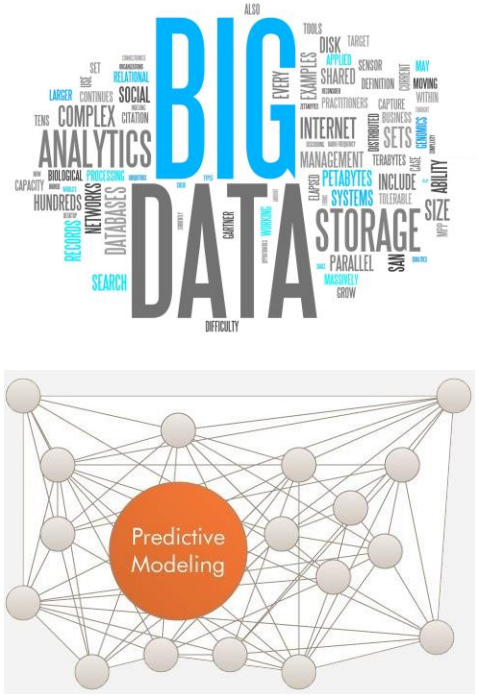
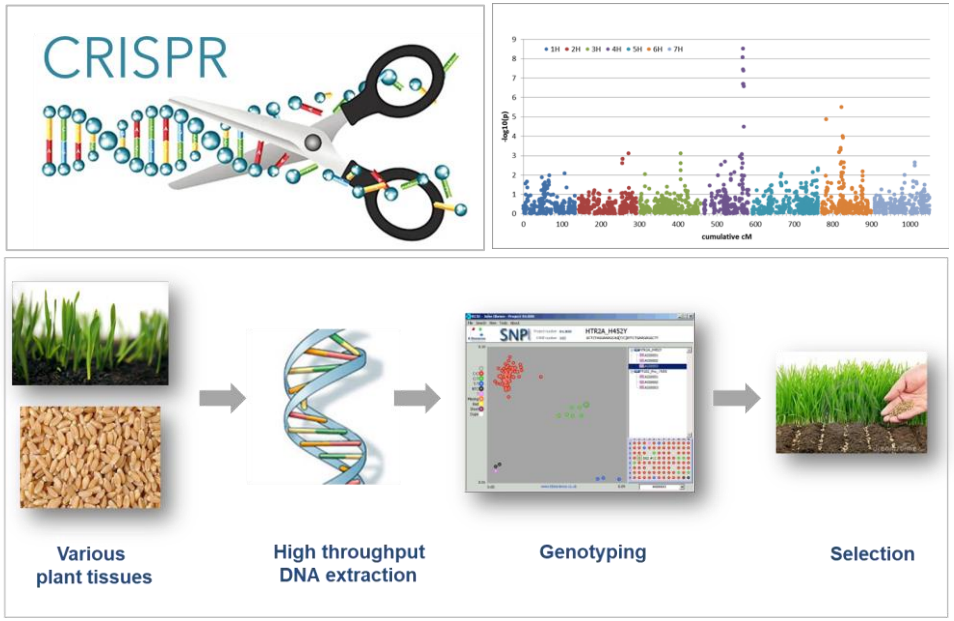
Enable HTP technologies





- ✓ **Costly**
- ✓ **Require different competences**
- ✓ **PPPs are one way in which expertise from different fields can be combined to reach breeding innovative solutions**

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https://virtuosoft.pk/what-is-big-data-why-is-big-data-important-in-todays-era/ https://oneill.law.georgetown.edu/gene-editing-the-health-and-ethical-implications/ https://www.springml.com/blog/predictive-modeling-approach/

Public Private Partnership for plant breeding

Nordic Pre-breeding Public Private Partnership

climatefutures

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Nordic PPP for pre-breeding

DET KONGELEGE LANDBRUKS- OG MATDEPARTEMENT

Forskningsmidlene for jordbruk og matindustri

Nordic Council of Ministers

NordGen

50/50

Private

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Sejet plant breeding
DLF SEEDS & SCIENCE
Nordic Seed
DANESPO
Boreal
Lantmännen
SECOBRA recherches
syngenta

Public

UNIVERSITY OF COPENHAGEN
SLU
NMBU
NIBIO NORWEGIAN INSTITUTE OF BIOECONOMY RESEARCH
Luke NATURAL RESOURCES INSTITUTE FINLAND
LANDBÚNAÐARHÁSKÓLI ÍSLANDS
Latvia University of Agriculture
LAMMC
Estonian Crop Research Institute
www.emu.ee
Eesti Maaülikool
Estonian University of Life Sciences

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Nordic PPP for pre-breeding

- Strengthen plant breeding in the Nordic countries
- Promote sustainable use of genetic resources in the Nordic region
- Introduction of new traits in commercial breeding
- Development of efficient tools and methods
- *Networking (pre-competitive collaboration)*

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Nordic pre-breeding PPP: 4 phases 2012 – 2023…

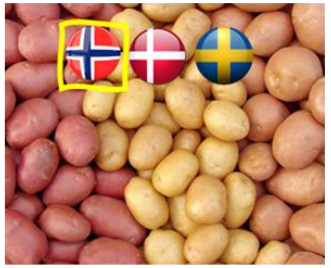
PPP_Barley
2012-2020

PPP_Ryegrass
2012-2020

PPP_Apple
2012-2021

PPP_Strawberry
2018-2020

PPP_Wheat
2021-2023…



PPP_Potato
2021-2023…

PPP_Phenomics
2015-2023…

- Obtained knowledge and competence
- Strong network
- Developed breeding methods and tools; e.g., MAS, GS, phenomic….
- New breeding material; e.g., MAGIC

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Centre for Research-based Innovation

NORCE

The Research Council of Norway

Forskningsmidlene for jordbruk og matindustri

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Navigating Climate Risk

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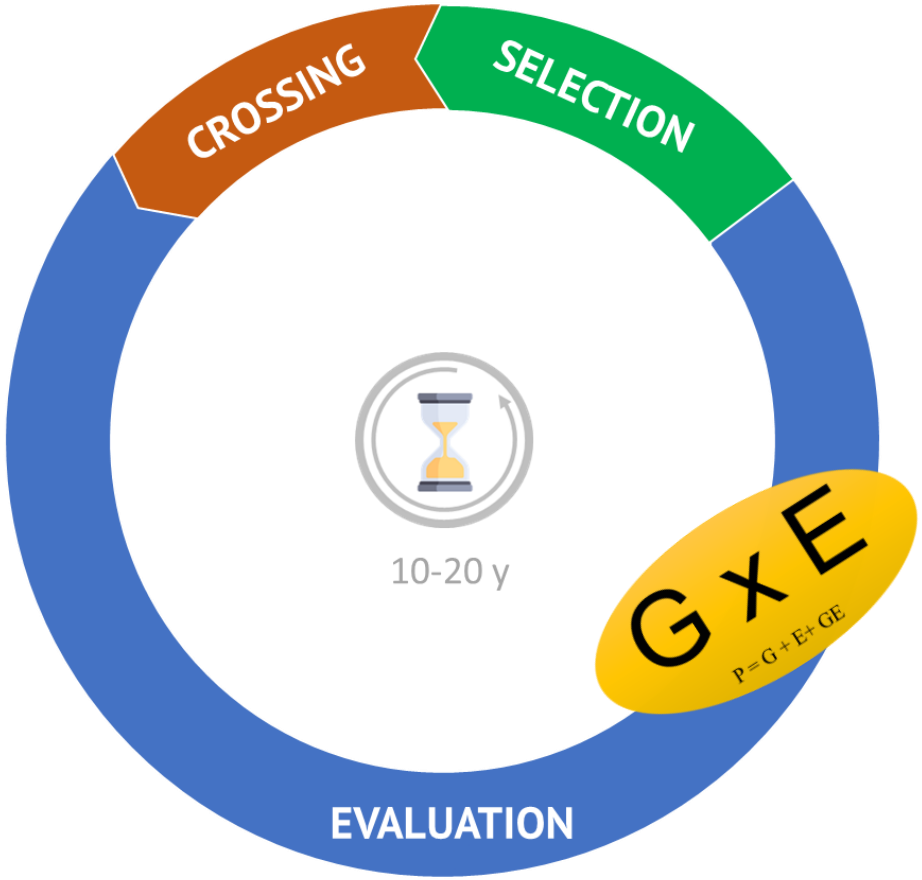
Breeding, environment and market



Breeding goal

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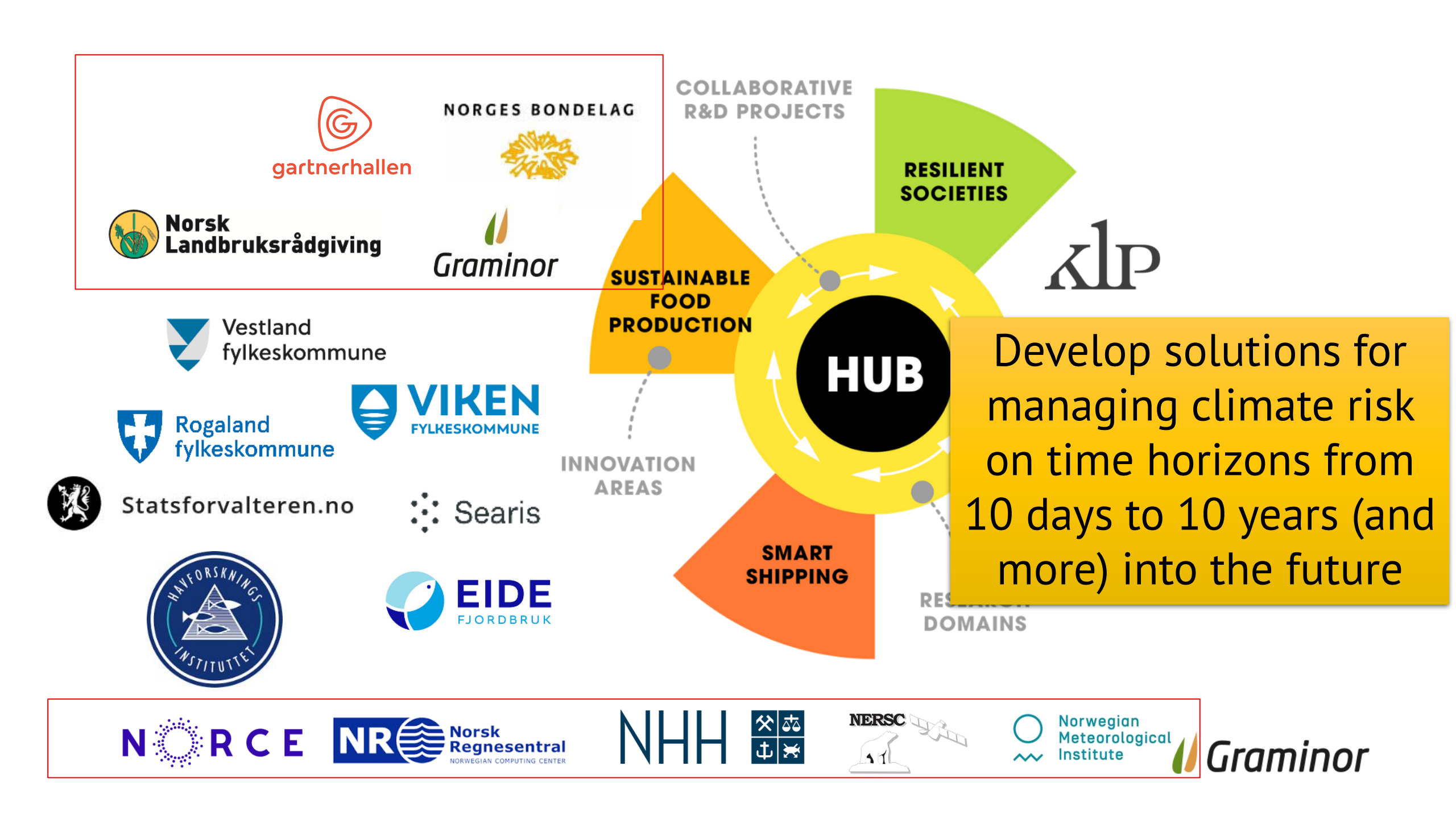
gartnerhallen
NORGES BONDELAG
Norsk Landbruksrådgiving
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COLLABORATIVE R&D PROJECTS
RESILIENT SOCIETIES
SUSTAINABLE FOOD PRODUCTION
HUB
SMART SHIPPING
INNOVATION AREAS
RESEARCH DOMAINS
KLP
Vestland fylkeskommune
VIKEN FYLKESKOMMUNE
Rogaland fylkeskommune
Statsforvalteren.no
Searis
EIDE FJORDBRUK
HAVFORSKNINGS INSTITUTTET
Develop solutions for managing climate risk on time horizons from 10 days to 10 years (and more) into the future
NORCE
NR Norsk Regnesentral
NORWEGIAN COMPUTING CENTER
NHH
NERSC
Norwegian Meteorological Institute
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Climate Future: Breeding goals

- Short, medium and long-term climate prediction
- Prediction of variety performance (+offspring) in different environments (short-medium-long terms) – based on current and historical information.
- Identify current locations that represent future medium- and long-term climate
- Potential new crops for Nordic market

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Some remarks

- PPPs can effectively bridge the gap between public and private sectors' competencies.
- Particularly important for plant breeding to stimulate development through innovation or/and translating research into useful and relevant tools.
- Leverage access to knowledge and technologies
- Can reduce development cost and increase efficiency

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Thank you!