ReSlope Global: North-South Slopes Cultivation

New Program to Convert Semi-Arid Topography into Arable Land;
15% of World Surface Area is semiarid where

Research, Invent, Innovate, Implement

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The ReSlope Program

Objective: Creation of a program and following enterprise that will convert large tracts of unproductive semi-arid marginal land worldwide into arable land for food crops and extends the green revolution into water-stressed regions.

Need: Food supplies are under pressure worldwide, as is the supply of arable land. Arable land is dwindling worldwide due to soil contamination, erosion and draught.

- Food prices are increasing. World's food security is fragile due to climate change.
- Estimated total land available for North-South slopes is in the range of hundreds thousand square miles.

Solution– the North Slope Effect (NSE): The north-facing slopes of naturally occurring hills and ridges of land in semiarid areas of the southwestern United States, Southwest China, Middle East, North Africa and Southern Europe are typically green and moist, while the south-facing slopes of such ridges are typically dry and agriculturally useless. The difference, is due to different micro-climates: the south slopes as well as flat terrain are subject to much more intense solar irradiation and much higher rates of evaporation and transpiration (the combined term is evapotranspiration), while the solar irradiation and evapotranspiration on the northern slope (in the northern hemisphere) is lower allowing for vegetation and biomass growth.

The Opportunity – Imitating Vegetation Patterns on Natural Slopes

North

Typical natural North-South slopes in semiarid areas. The northern slope is lush, moist and green; the southern slope as well as the flat terrain are dry and unusable. Only the northern slope is potentially cultivable.

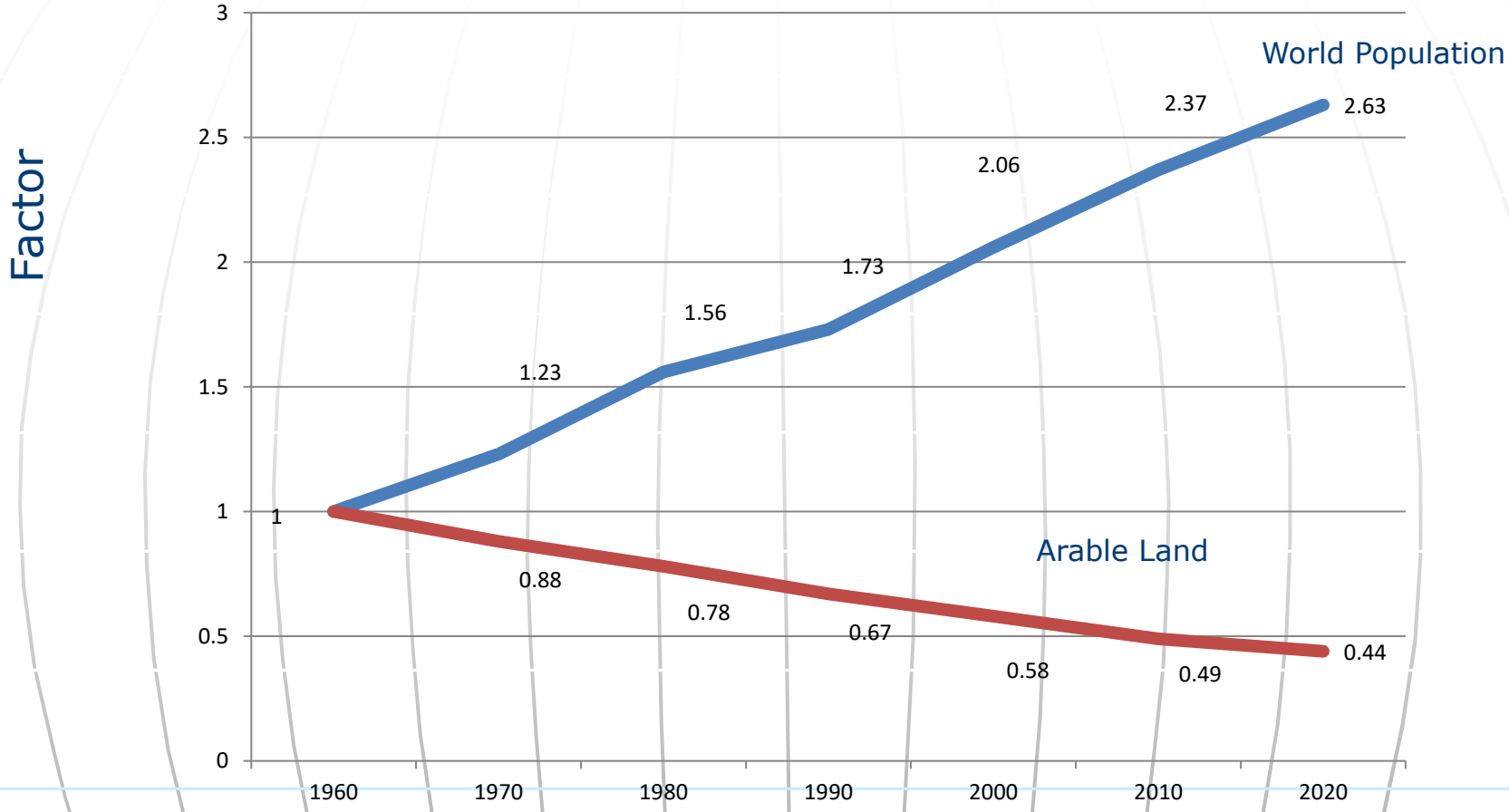
Hundreds of thousand sq. kilometers can be potentially upgraded into cultivable land

Consider the following example: The annual precipitation in London, UK is 24 inches, while the annual precipitation in Dallas, TX is 35 inches. And yet London (51 Deg latitude) is green and lush while Dallas at latitude 31.5 Deg is semi-arid. A small difference in latitude and solar irradiation flux can cause a dramatic difference in vegetation and bio mass productivity.

More Examples

North

Public Work, San Angelo, Texas. Grass appears spontaneously on northern slope two weeks after digging



World population and arable land, 1960-2020. World population has increased by a factor of 2.63 while arable land has reduced to 44% of the arable land available in 1960. This would mean that in 2020 each unit of arable land must produce 2.63/0.44 = 5.97 times more than a unit arable land did in 1960. Such an increase in productivity is difficult to obtain. Therefore more arable land is needed to avoid world food security crisis. Source: FAO

The growing middle class in developing countries requests more protein in their diet. It takes 10-25 kg of feed to produce 1 kg of beef. Cultivating of the necessary animal feed will require more arable land.

Feed Conversion Inefficiencies	Chicken	Pork	Beef
Feed conversion (feed/live weight)	2.5	5	10
Feed conversion (feed/edible weight)	4.5	9.4	25
Protein content (% of edible weight)	20	14	15
Protein conversion efficiency (5%)	20	10	4

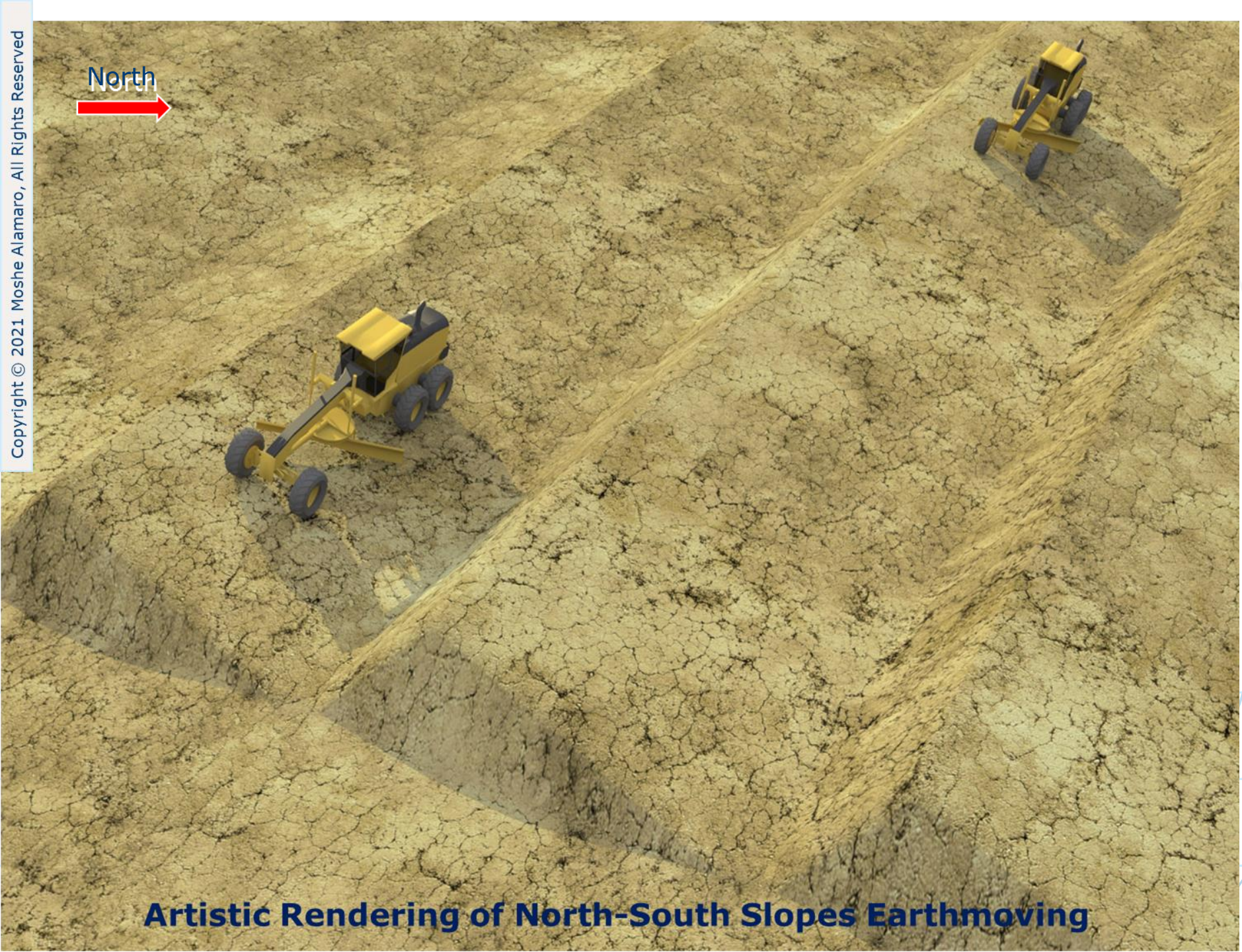
Source: Vaclav Smil, 2008. Eating meat: Evolution, Patterns and Consequences

https://awellfedworld.org/feed-ratios/

awell-fedworld
plant-based hunger solutions

North

Construction of north-south slopes



Artistic Rendering of North-South Slopes Earthmoving

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North

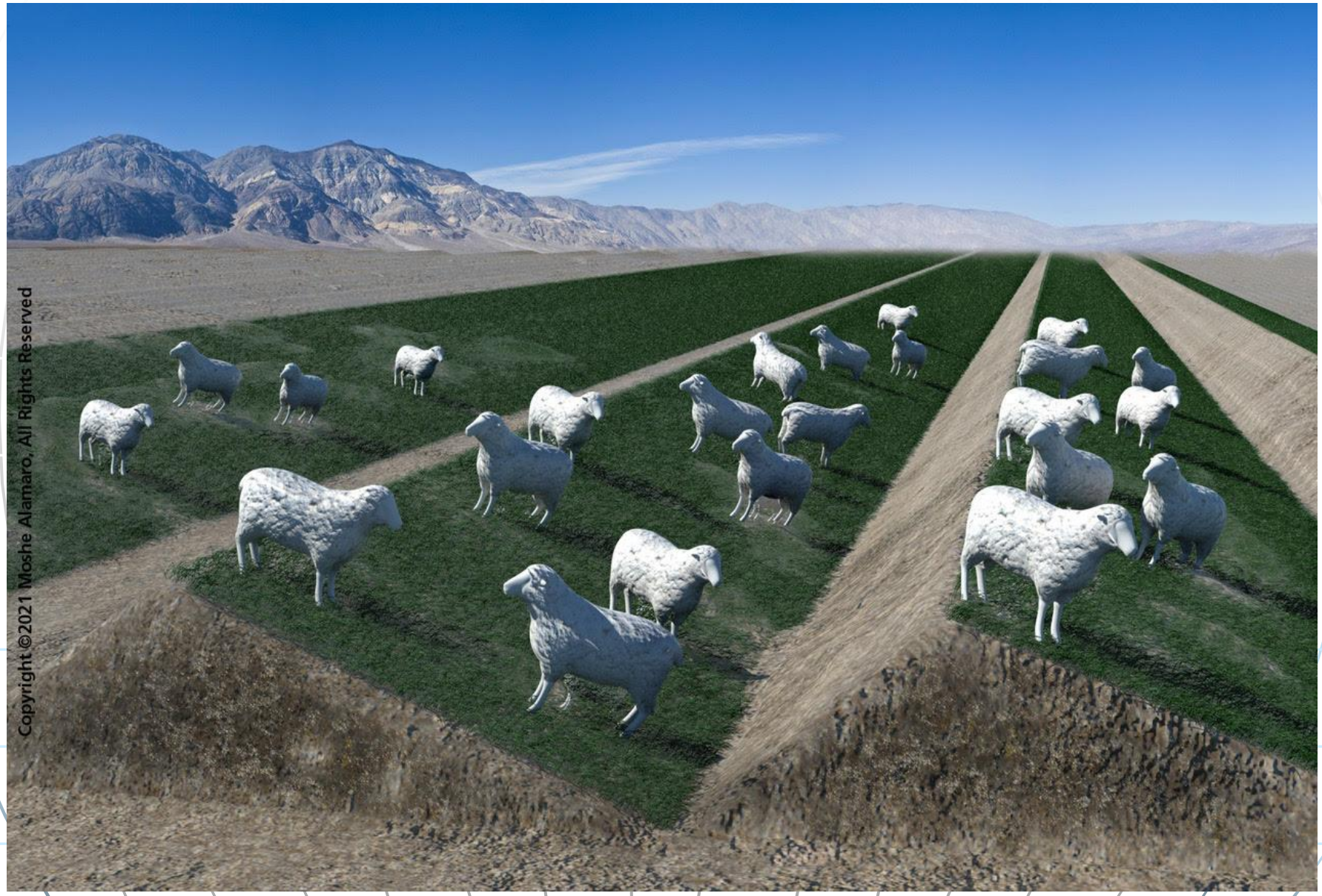
Cultivation of the northern slopes

North

Cultivation of the northern slopes

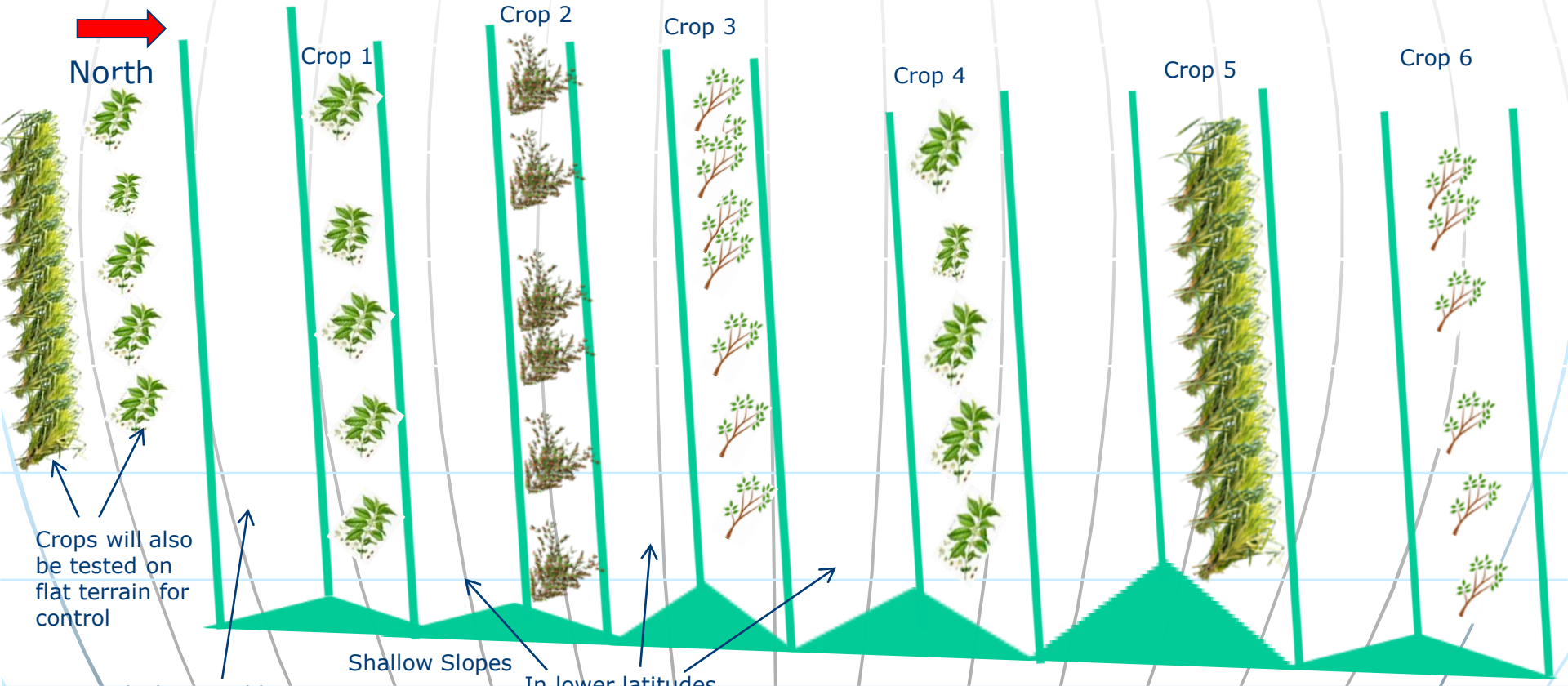
North

ReSlopes Grazing



Pilot Testing and Demonstration –Phase 2

The diagram below shows the pilot site where many different angled slopes and different crops will be tested. Testing will also be done on flat terrain nearby for control.



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Carbon Footprint

- Earthmoving and turnover earth release carbon from soil
- to the atmosphere 

- Deep soil does not contain carbon - bring it to the top does not create carbon footprint 

- One earthmoving for N-S slopes will be enough for years 

- The cultivated crops over 20 years absorb carbon 

- Surface soil that is cleared of carbon will increase the CO2 concentration gradient between the atmosphere and the soil leading to faster re-sequestering of carbon 

- Cultivation of cereal in semiarid areas will substitute imported cereal cultivated in other countries where carbon liability is also created 

These factors will be used carbon footprint accounting of the N-S slopes

International Collaboration

- Addressing development for different latitudes, climate and intended crops, - developing a few pilots in parallel
- Division of labor
- Increasing diversity of funding sources

International collaboration:

- ✓ University of Perugia, Italy
- ✓ ICAR, India
- ✓ Universidade Federal de Campina Grande, Brazil
- ✓ Scientists from Denmark Technical University, Utrecht University and Oregon State University provide expertise on earthmoving and water economics