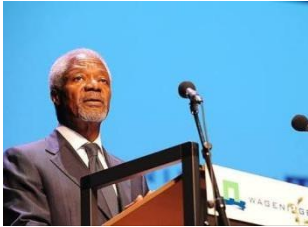




Climate Smart Food Security

The Impact of Global Cooperation in Research

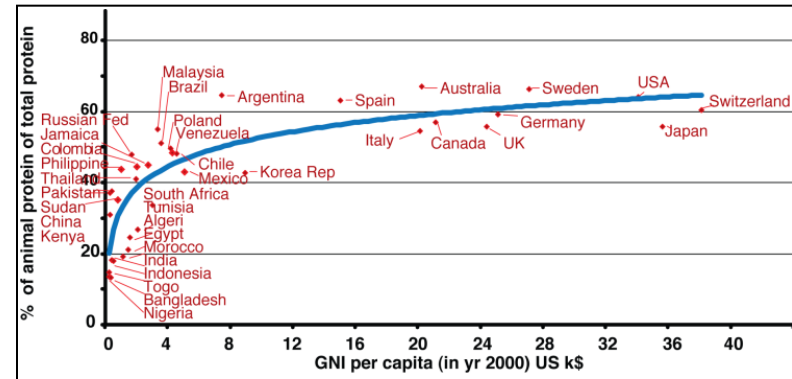
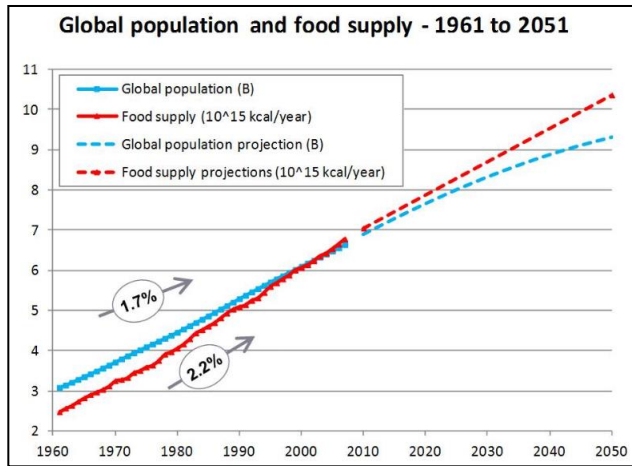
The Dual Challenge



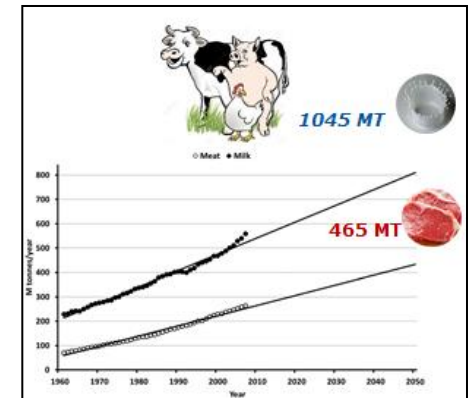
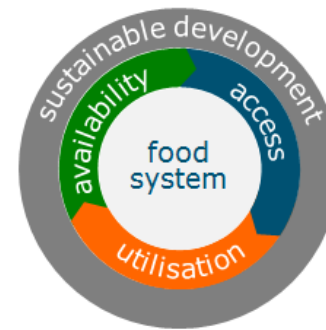
**Healthy Food and Nutrition ...
.... for > 9 Billion People in 2050 ...
..... within the Capacity of our Planet**



More Nutritious Food Required



**FEEDING CITIES:
FOOD SECURITY
IN A RAPIDLY
URBANIZING WORLD**



From Crops to More

20th century

Green Revolution



- **Wheat (1950's)**
- **Rice (1970's)**
- **Maize (1980's)**
- **Soy (1990's)**

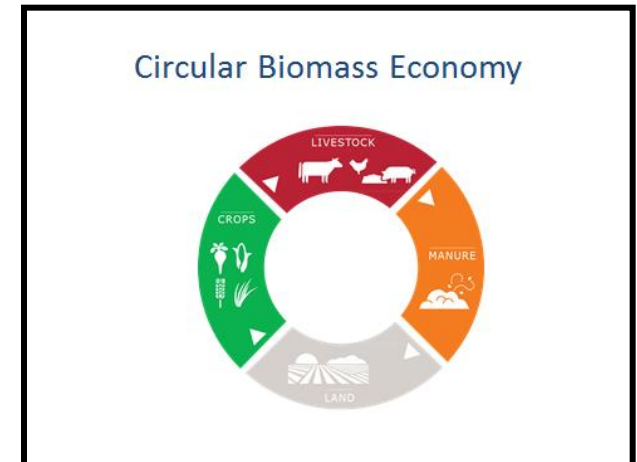
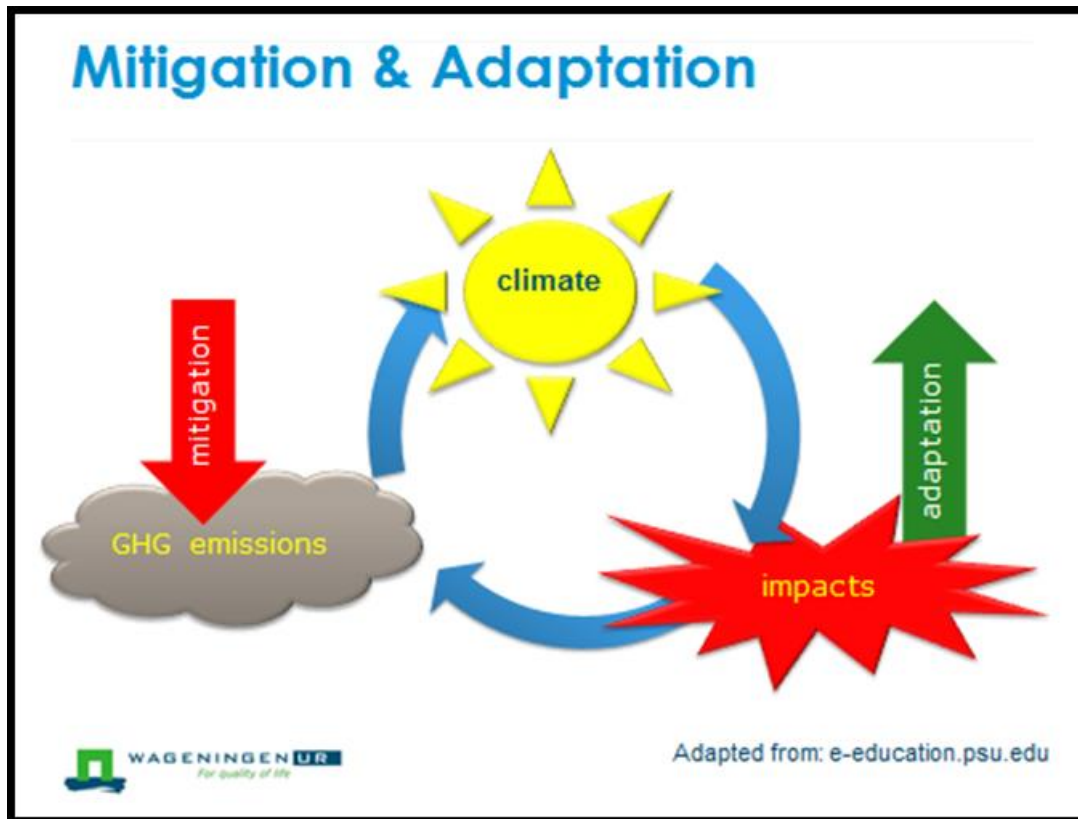
21st century

White Revolution



- **Beef (1980's)**
- **Eggs (1990's)**
- **Poultry) (2000's)**
- **Fish (2005)**
- **Dairy (2010)**

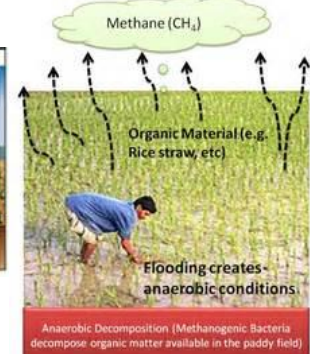
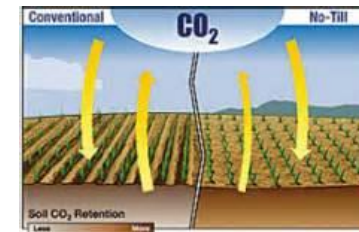
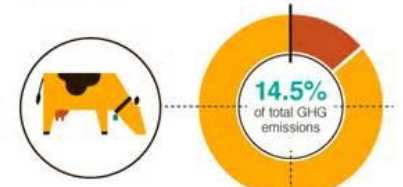
In a Climate Smart practice



Low Footprint Food Production

- **Global Emission Agricultural GHG emissions:**
 - 10 billion tonnes Co₂eq (ca. 20%)
 - 60% livestock related
 - 40+% mitigation potential
- **Global Agricultural GHS sinks:**
 - 2 billion tonnes Co₂eq
 - 60% more sequestration potential

Livestock contributes 7,100 MtCO₂e/year or 14.5% of total global GHG emissions



Rice Paddy Field



Adapted Food Production

Extreme Storms and Rains

Extreme Droughts

Higher Temperatures

More Floods



Reduced Crop Yields

Limited Water Resources

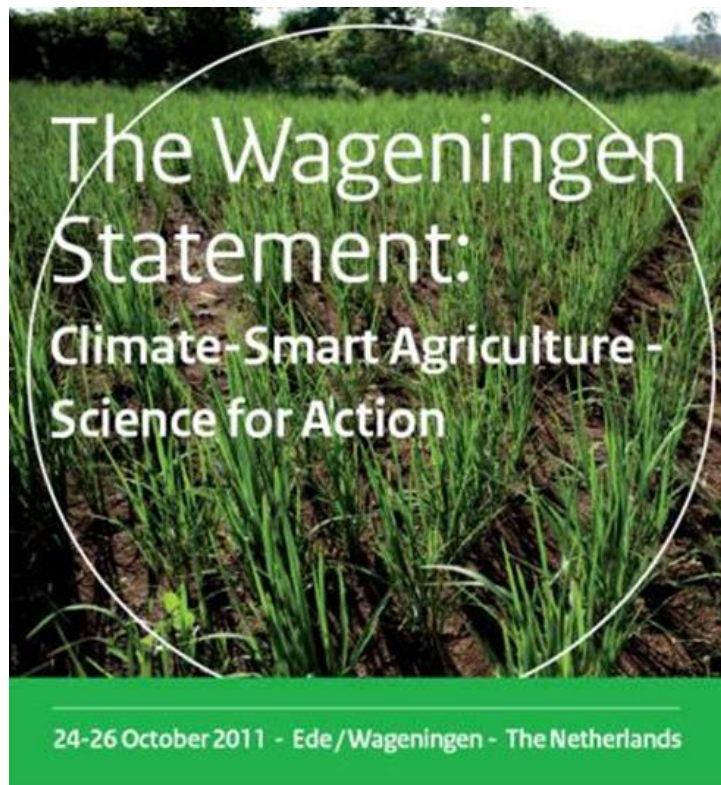
Soil Erosion

Inundation of land

Infectious diseases



Knowledge Based!!



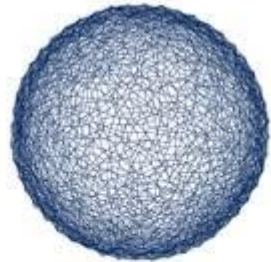


Global Research Alliance on agricultural greenhouse gases

June
16-17, 2012

Hyatt Regency
San Diego

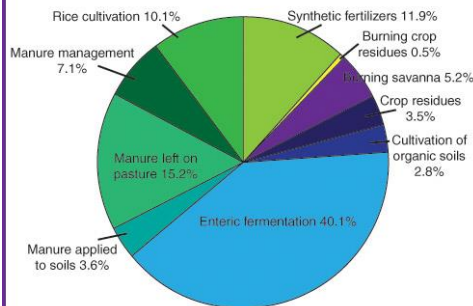
Initiated 2009, Established 2011



COP15
COPENHAGEN
UN CLIMATE CHANGE CONFERENCE 2009



GHG emissions by sector, 1990-2011 average



Source: U.N. Food & Agriculture Organization.



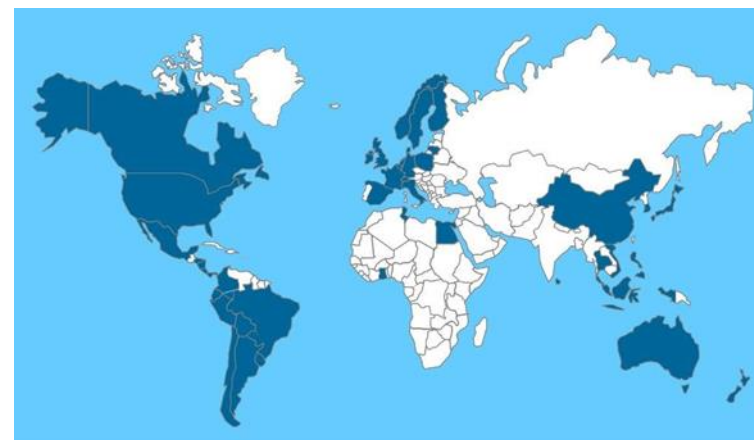
PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

GLOBAL
RESEARCH
ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

GRA 46 Members and Partners

- brings countries together to find ways to grow more food with lower emissions
- by improving global cooperation in research
- to support farmers, policies and other international organizations



GLOBAL
RESEARCH
ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

ALLIANCE OF 5 GROUPS; 15 NETWORKS; 3000 RESEARCHERS

RESEARCH GROUPS



livestock



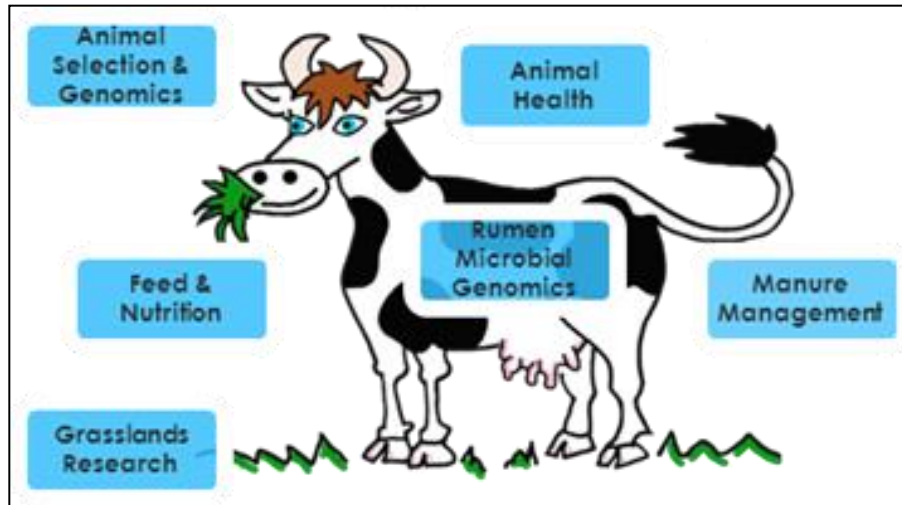
croplands



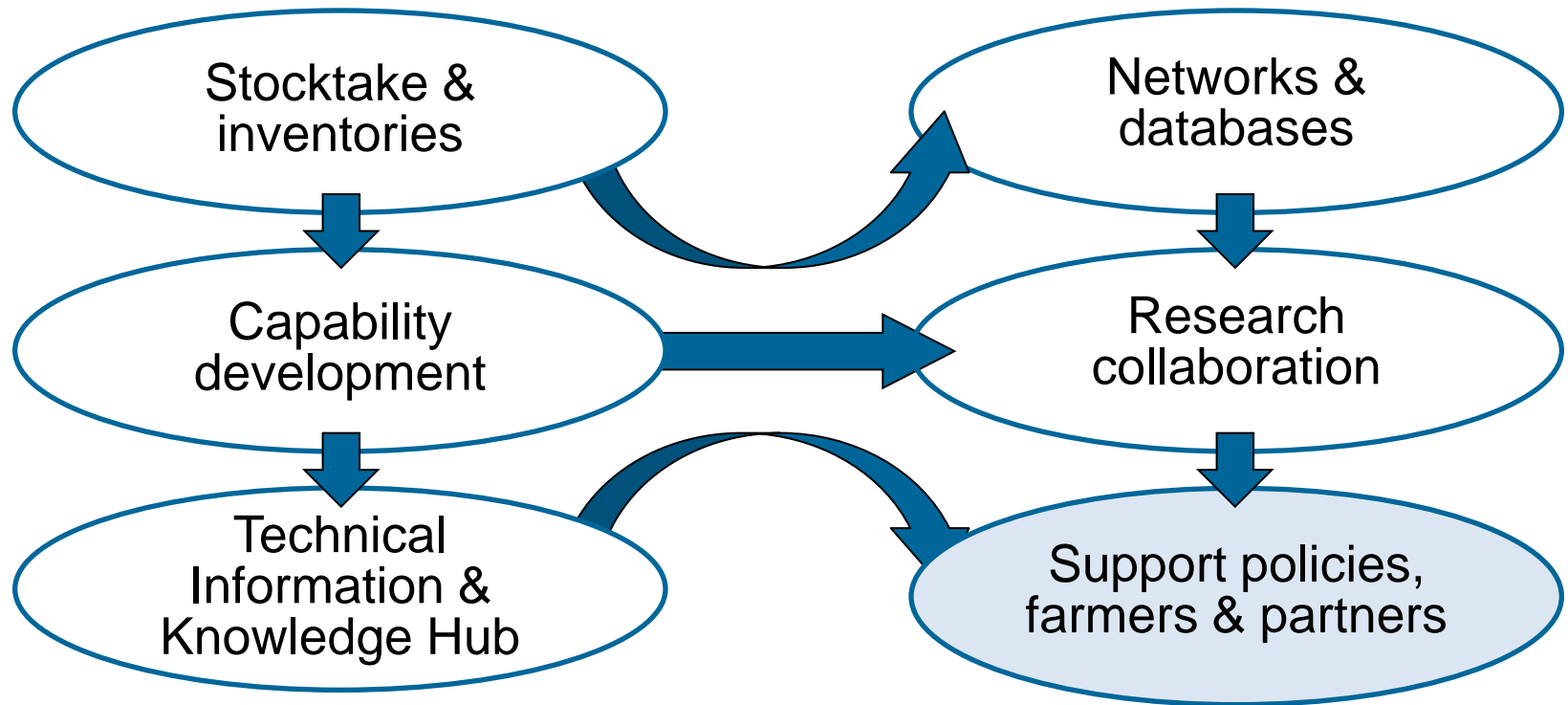
paddy rice



Thematic Areas



How it works....



Common understanding

Concerted actions

What it brings.....

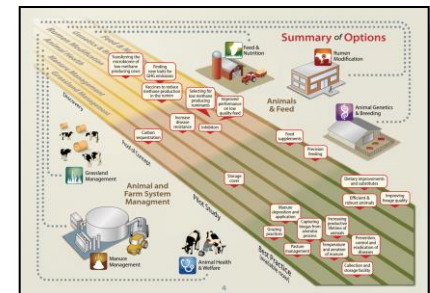
BETTER UNDERSTANDING

- Networks of Researchers
- Workshops
- Trainings & Fellowships
- Technical Guidelines
- Collaborative Research projects



BETTER PRACTICES

- Knowledge Hubs & Kiosks
- Technology Transfer
- Mitigation options
- Adaptation options
- Support to Farmers



Global Scope: Regional Actions

- ✓ South America
- ✓ Central America

- ✓ South East Asia
- ✓ South Asia

- ✓ West Africa
- ✓ East Africa

- ✓ Central & East Europe
- ✓ Mediterranean
- ✓ *Central Asia*



AN Integration of Mitigation and Adaptation options for sustainable Livestock production under climate CHANGE

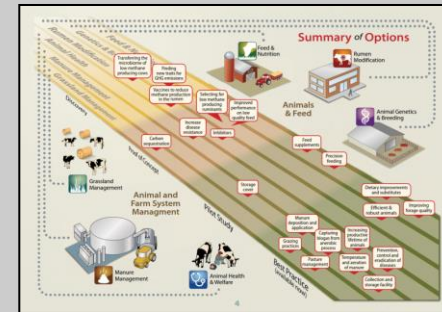
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RESEARCH
ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

Action in Practice

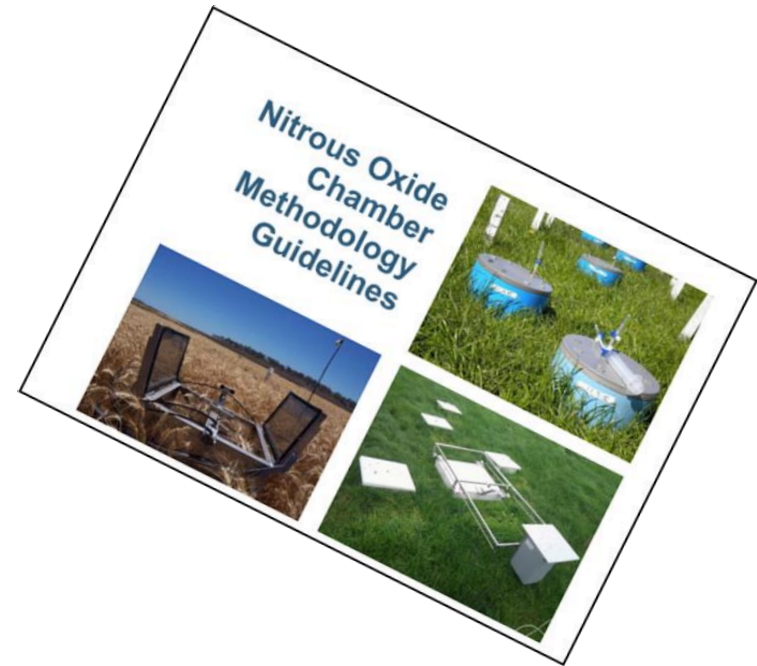


Perspective:
40+% Methane Reduction




- Genotyping Low Methane Production for Selection
- Improving Feed Quality and Digestibility, Rumen Microbes
- Improving Animal Health and Husbandry Conditions
- Manure Management: Collection, Storage and Utilisation
- Improving C Sequestration Soils
- Precision Livestock Farming

Communication



GlobalResearchAlliance.org



@GRA_GHG

Impact: Subtle Mind Shifts

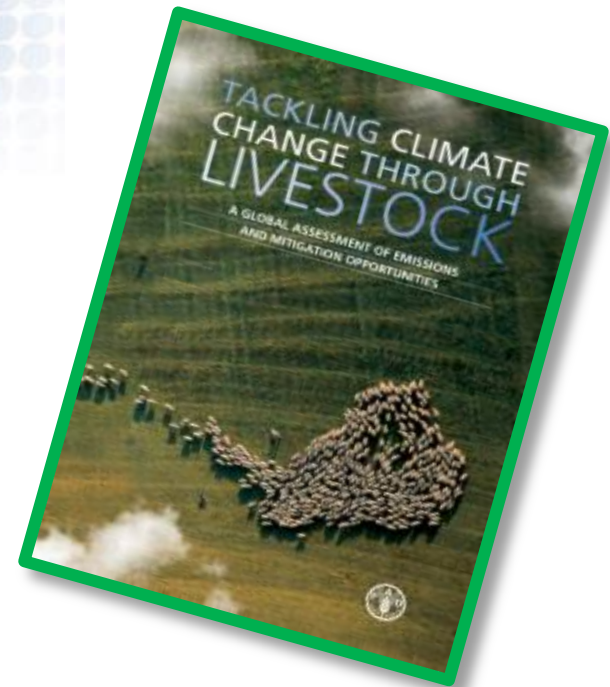
2007



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2013



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Thanks for
your attention



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secretariat@globalresearchalliance.org