

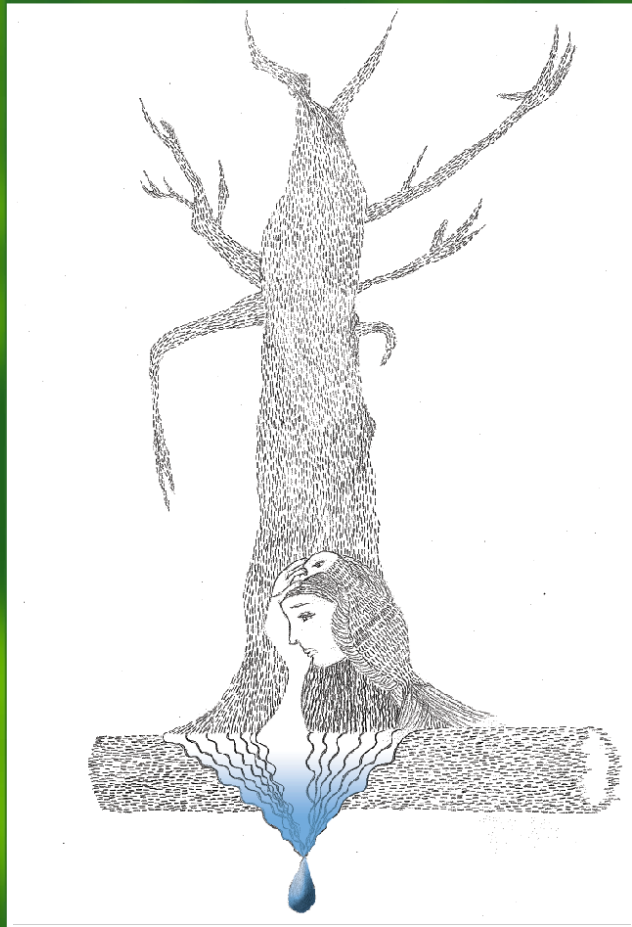
# **Adaptation goat production systems to climate change**



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DR. İRFAN DAŞKIRAN**

08/04/2014

EAAP Annual Meeting 25-29 August 2014 Copenhagen, Denmark



## In this presentation

- Concept of climate change
- Climate and goat production interaction
- Adaptation of goat breeding against to climate change will be presented.

# Earth Temperature

## Solar energy

Sun

Solar energy





# Earth Temperature



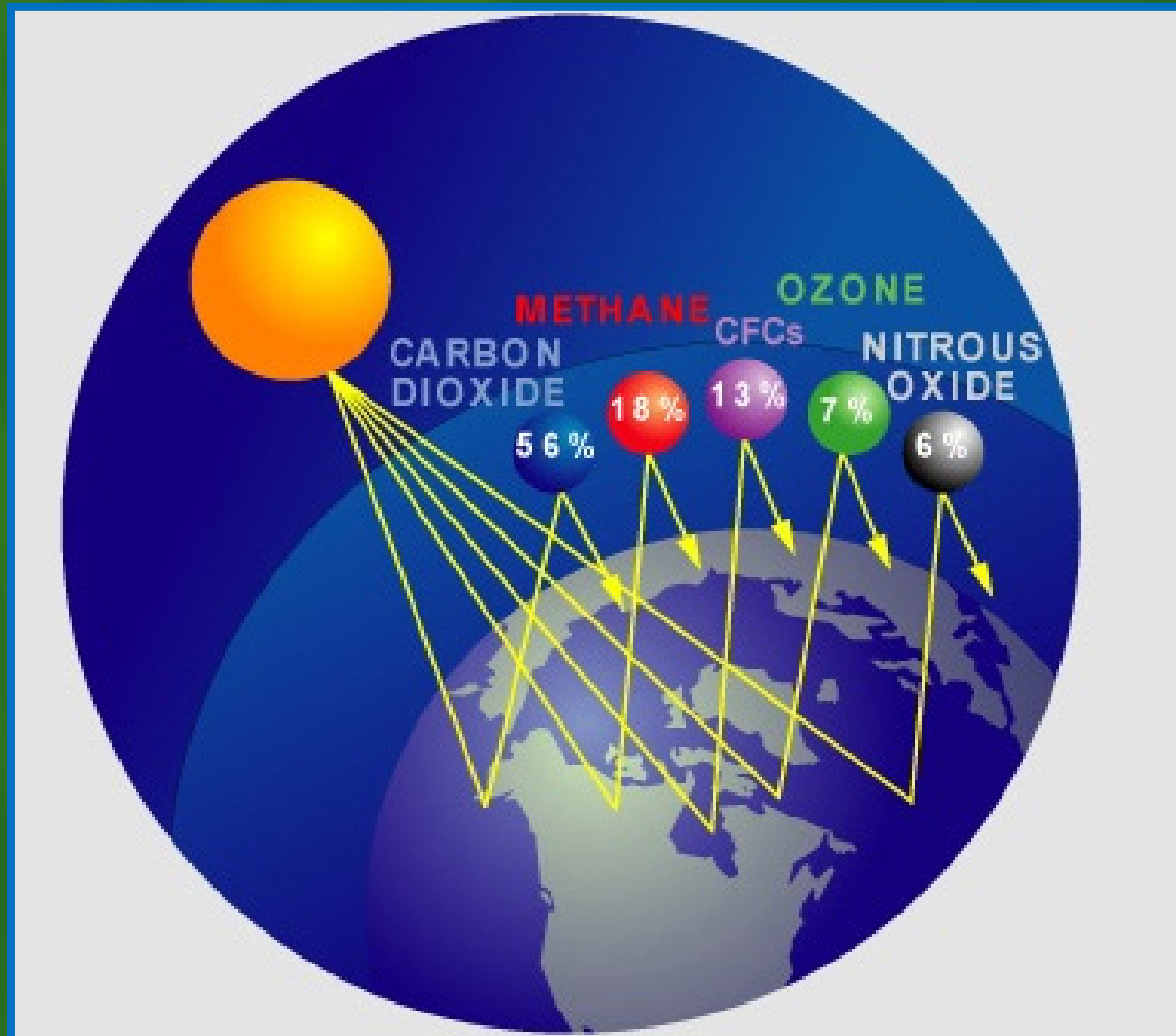
Sun

Solar

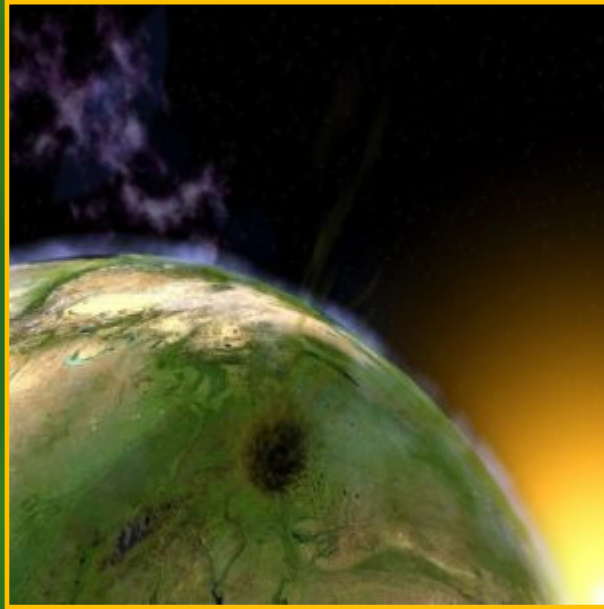
Energy

Reflection of  
solar radiation

# GREENHOUSE GASES (GHG)



## GREENHOUSE GASES-2



In equal quantities,

**Methane** has 23 times more detrimental effect than CO<sub>2</sub>,

While **Nitrous oxide** has 296 times effect.



# GREENHOUSE GASES-3



For the Total GHG emissions ;

Livestock production is responsible for

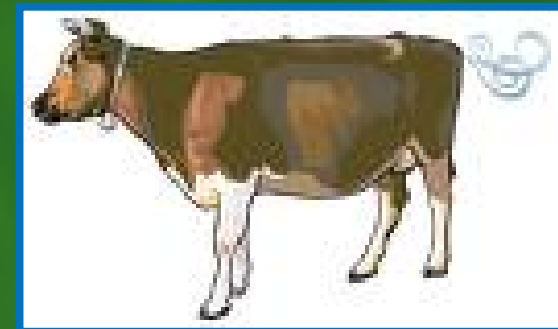
37 % Methane ,

65% nitrous oxide

9 % CO<sub>2</sub>

64% NH<sub>3</sub> in total emission

02.09.2014



# GHG Emissions from Livestock Production in Turkey



Species	Enteric (Tonne)	Manure (Tonne)	Total (Tonne)	% of Total
Cattle	675,394	108,457	783,850	77
Sheep	203,800	6,114	209,914	20
Goat	29,600	888	30,488	3
<b>Total</b>	<b>908,794</b>	<b>115,459</b>	<b>1,024,252</b>	





The greenhouse gas in animal production is released particularly from animals (enteric fermentation), for the manure and feed production areas which are used as grassland.



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In 2007, humans used resources equivalent to 1,5 times our planets capacity to renew for their activities. If we continue at this rate we would need 2 globes by 2050.



## **What is carbon footprint**

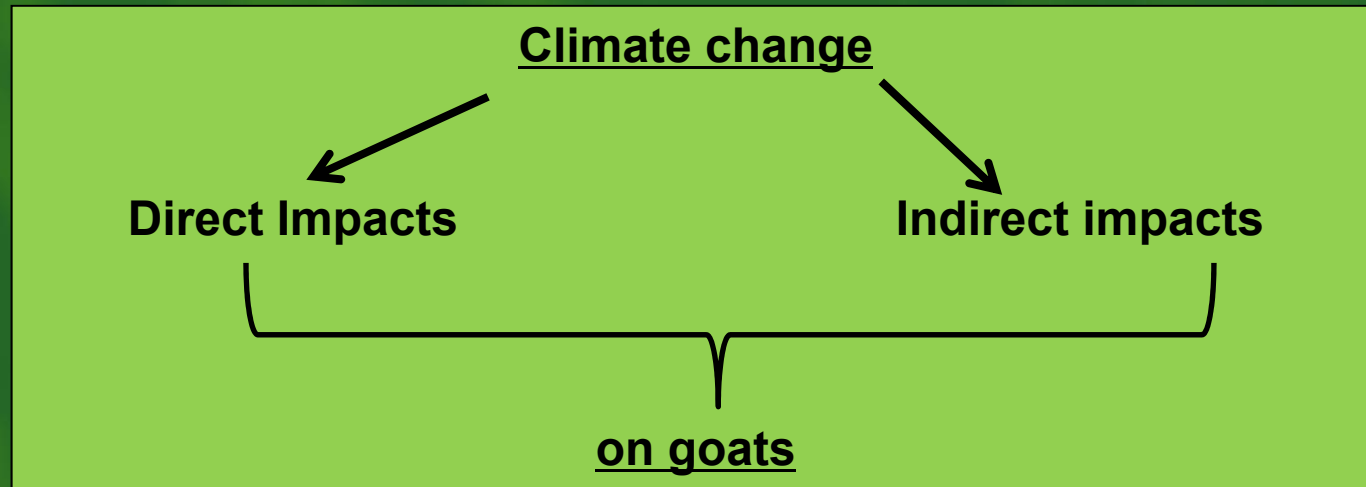
A carbon footprint is the measure of the environmental impact of a particular individual or organization's lifestyle or operation, measured in units of carbon and is a component of the ecological footprint.





**Ecologic footprint,** is rooted in the fact that all renewable resources come from the earth. It accounts for the flows of energy and matter to and from any defined economy and converts these into the corresponding land/water area required for nature to support these flows.







The direct impacts of climate change on goats are;

- temperature
- relative humidity
- wind speed
- vegetation



Direct effects



**The optimum environmental requirements of goats;**

**Air Temperature: 13–18°C**

**Relative humidity %50–60**

**Low wind levels**

# Heat Index



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 bovine somatotropin by Monsanto

**% RELATIVE HUMIDITY**

°F	°C*	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
72	22.0																						
73	23.0																						
74	23.5																						
75	24.0																						
76	24.5																						
77	25.0																						
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\*Approx. ± 0.2  
 References:  
 1) Armstrong, D.V. 1993. Environmental modification to reduce heat stress. In: Western Large Herd Dairy Management Conference Proceedings, Las Vegas, NV, 1993.  
 2) Beede, D.K. and Shearer, J.K. 1991. Heat Stress. Part 1. Nutritional Management of Dairy Cattle During hot Weather. Agri-Practice, Vol 12, No. 5, Sep/Oct 1991  
 3) Bray, D.R. and R. Bucklin. 1996. Recommendations for Cooling Systems for Dairy Cattle. University of Florida, Cooperative Extension Service. Fact Sheet D5-29.  
 4) Patton, R.A. 1994. The Dairy Cow in a Hot Environment: Productive and Physiological changes and their effect on Management. Proceedings of the Stress in Domestic Animals Conference, UNAM, Mexico.

**DANGER**



# Indirect Effects



- Longevity of Endemic species  
(Devendra, 1987)
- Goat health
- Productivity
- Availability of feed from by-products due to change in priorities
- Cost of production will increase (especially in intensive production)
- Reduce market options





بقی زمین ہر اسایر ایرکوردپ و سربرسی تیر و خاکسی ہدف اجابتہ ایریشوب انولج  
افین و ملاحظہ اید ملر فراران نزار حسینلاید و پت پہلو اندرال اردین سیرہ قیوب قولان  
وصیت و صدای عالم کیر ایدہ شا و زمین کبی حدیث کبیر و کبیر و کبیر و کبیر و کبیر  
الوت بر بر نہ باقتہ ملر و قورقون پادشاہ عالم پناہ انکروس تراکت قورقون اخی کجاج ایدہ سو

# Conclusion



Sultan Murad II at Archery Practice  
A.D. 1584.





**In conclusion ;**

- ❖ **Suitable goat genotypes for productions need to selected appropriate locations.**
- ❖ **Production of endemic species need to be encouraged due to their resilience and capacity to adapt to extreme regional climatic conditions and diseases.**



- ❖ Early warning system and future prediction of goat production potential impacts is required,
- ❖ Govt. Funding and respective legislation needs to be provided for the protection of endemic goats species.
- ❖ Resilience of various goats species need to be identified ahead of onset of climate change and their genetics protected.

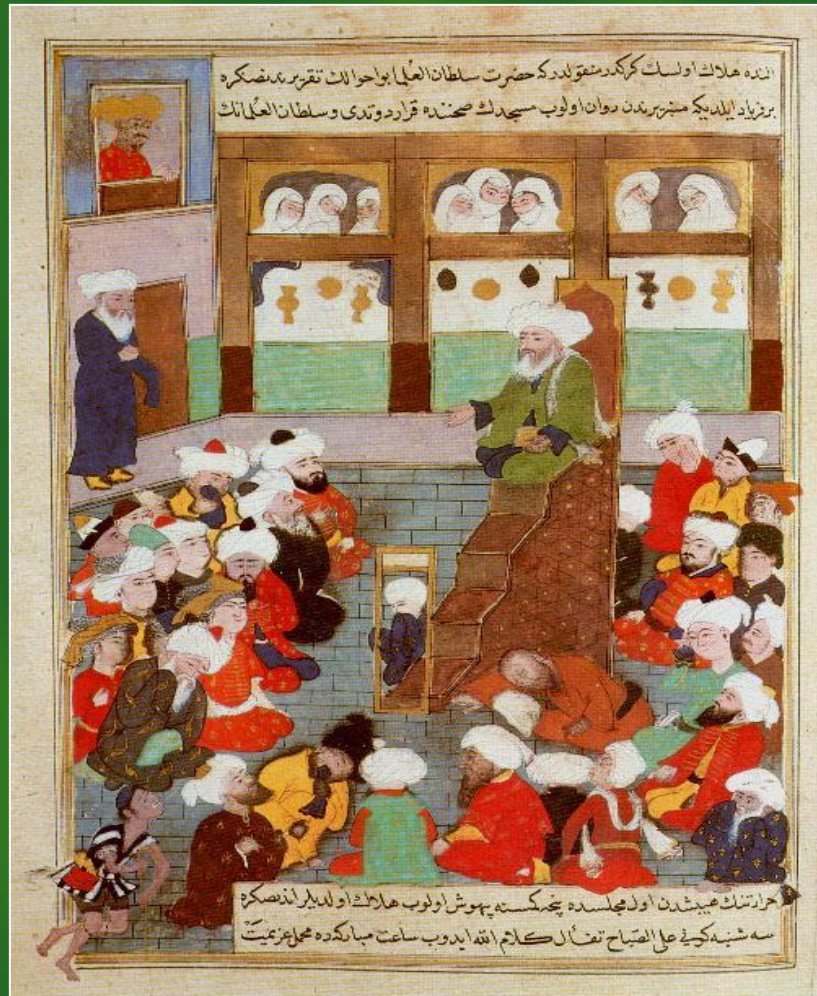






More effort needs to be made for  
Climate simulation models for goat  
genotypes;

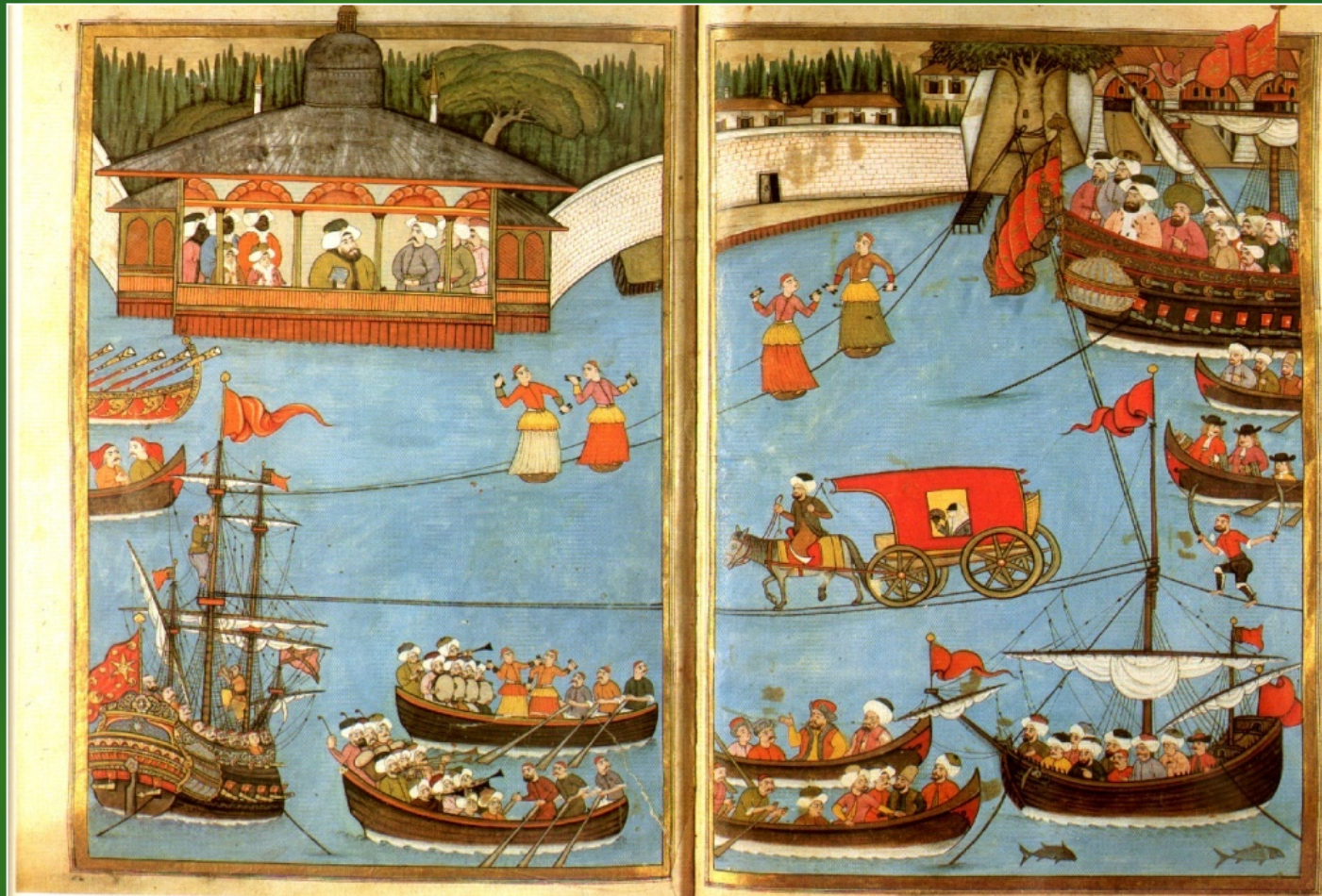
As goats are a very important livestock  
species, scientific and technological  
research should be prioritised;



CONFERENCE IN OTTOMEN PALACE – A.D.  
1368

- ❖ Education programs need to be provided to existing goat breeders regarding the potential effects of climate change.





FESTIVITIES ON GOLDEN HORN- A.D. 1632





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# IGA 2016

## 12<sup>th</sup> INTERNATIONAL CONFERENCE ON GOATS

25-30 September 2016, Antalya  Turkey

The role of the goat in society and sustainability of goat production in agro-ecosystem.

### Chair

Dr. İrfan Daşkiran

### Vice Chair

Dr. Nazan Koluman

### Important Dates

Abstract Submission Deadline

01 May 2016

Notification of Acceptance of the Abstracts

01 June 2016

Early Bird Registration Deadline

15 June 2016

Author Payment Deadline

01 July 2016

### Scientific Topics

- Nutrition, Feeds, Feeding Program
  - Biotechnology, Reproduction
- Pathology, Animal Diseases, Goat Health
  - Anatomy, Physiology, Welfare
- Breeding, Genetic, Selection, Genome
  - Goat Products ( Milk, Meat, Others),  
Organic Goat Products
- Sustainable Goat Production, Goat Farming Systems,  
Mechanisation & Milking and Industrial Goat Systems
  - Environment, Goat & forestry Relations
    - Goat Organizations
  - Goat Researches and Future Visions



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