IMPLEMENTING CLIMATE SERVICES FOR AGRICULTURE IN PERU

Senamhi
SERVICIO NACIONAL DE METEOROLOGÍA E HIDROLOGÍA DEL PERÚ

Timely information to live better

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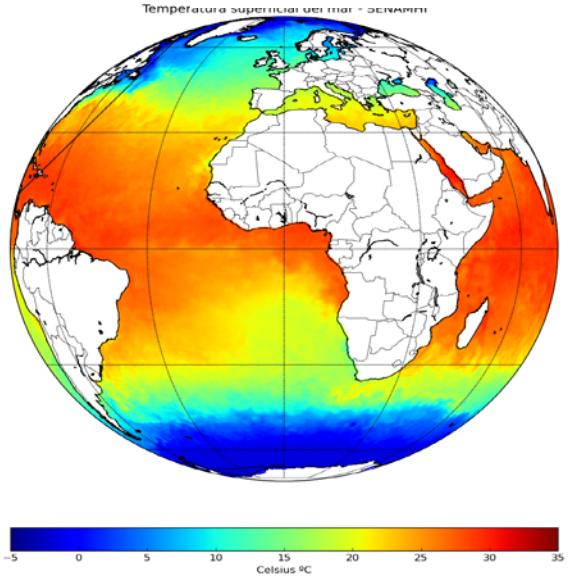
GLOBAL FRAMEWORK FOR CLIMATE SERVICES

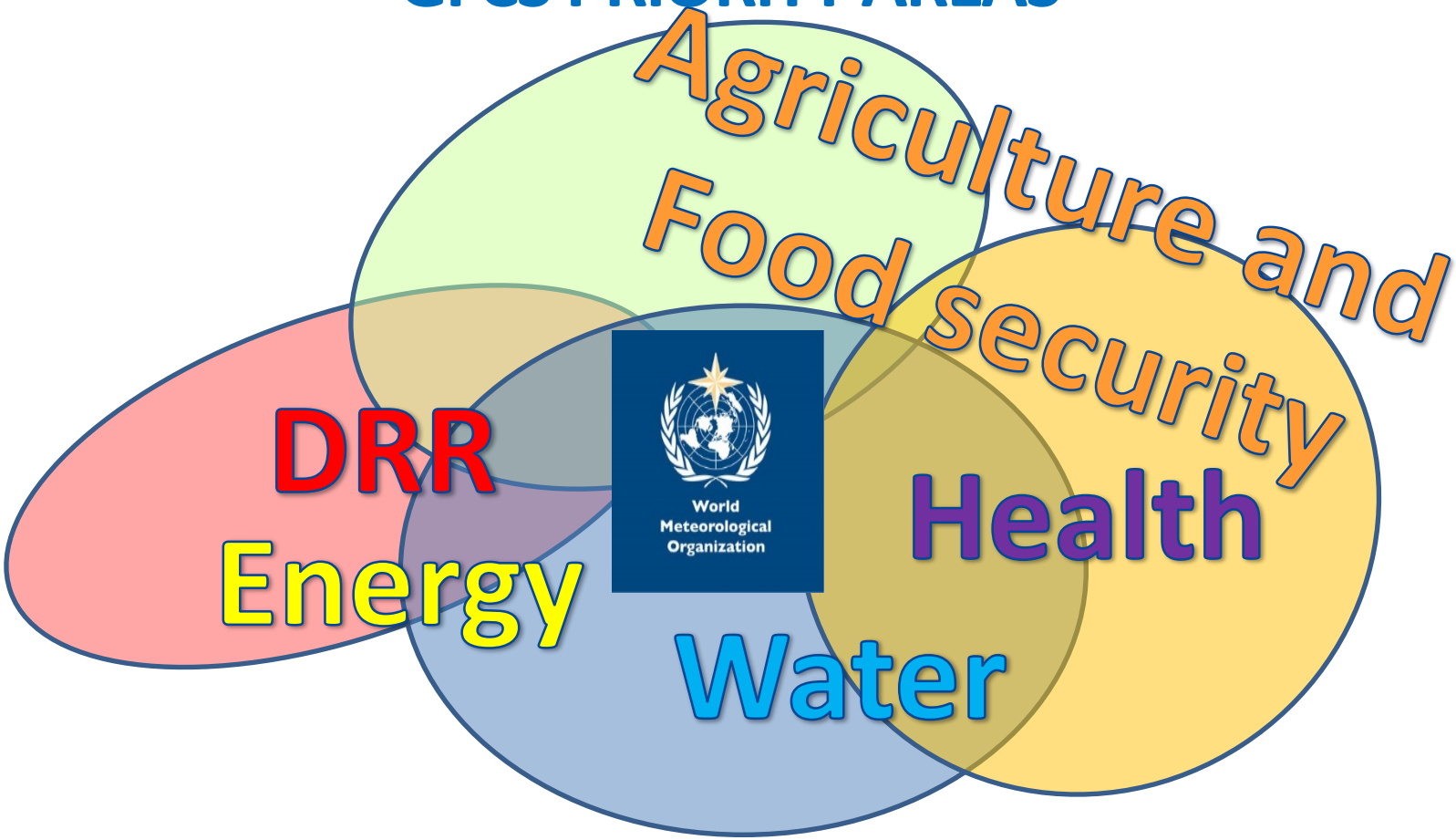
It is a Framework designed to mainstream climate science into decision- making at all levels and help ensure that every country and every climate-sensitive sector of society is well equipped to access and apply the relevant climate information.



World Meteorological Organization
Weather • Climate • Water

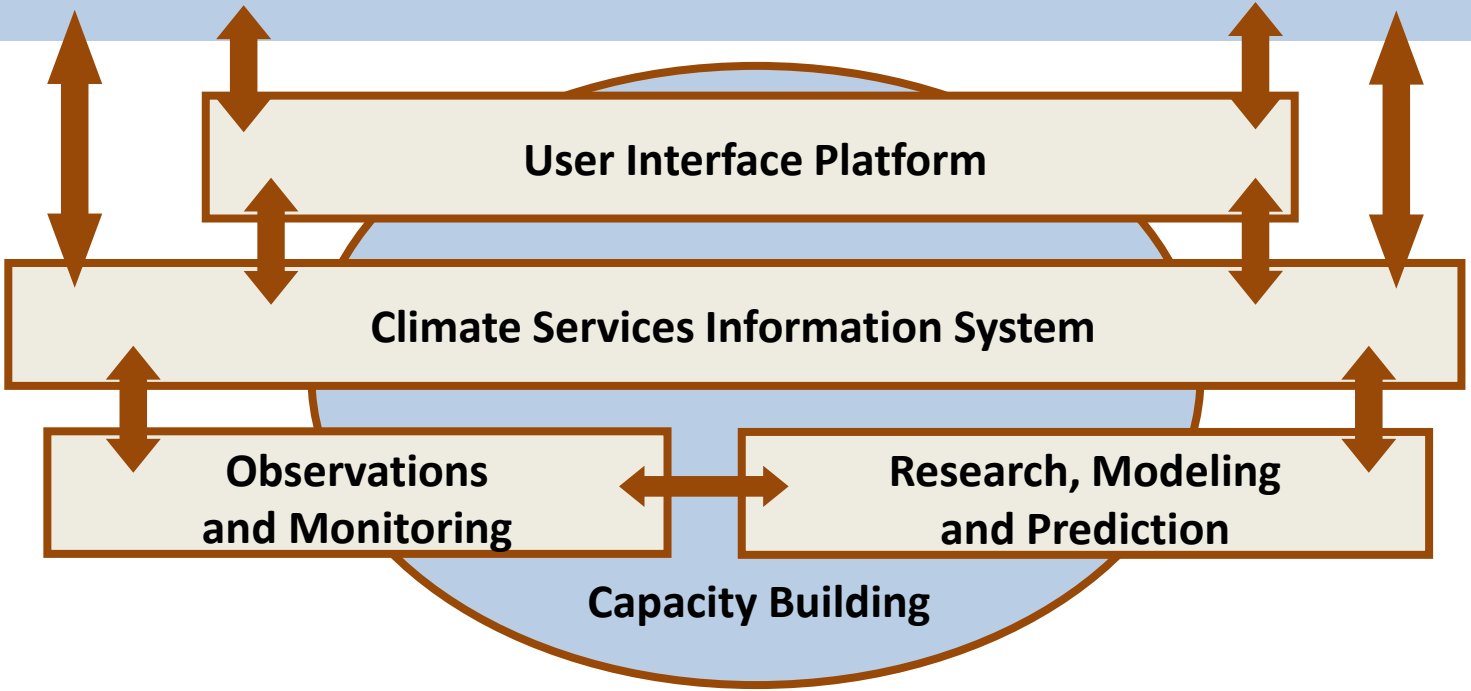
GFCS
GLOBAL FRAMEWORK FOR CLIMATE SERVICES

GFCS PRIORITY AREAS



THE PILLARS OF THE GFCS

Users, Government, private sector, research, agriculture, water, health, construction, disaster reduction, environment, tourism and transport.



AGRICULTURE

COAST AND HIGHLANDS OF PERU

COMMON FACTS

PRINCIPAL CLIMATE EVENTS IN THE HIGHLAND

FROST » **NEGATIVE IMPACTS**

+ Burnt leaves
+ Harm the normal plant growth
+ Effects on the fructification
+ Harvest shortfalls
+ Destruction of cultures
+ Soil freezing

FACING FROST:

20% **PREVENTIVE:** take measures to cope with the devastating effects of frost. They take time to fertilize the soil, cover the crops with plastic foil, change cultures, and advances the harvesting time.

57% **RESPONSIVE:** execute quick and immediate mitigating measures like smoke, soil irrigation, replanting, rocket burst and trimming of crops.

23% **PASSIVE:** do not take measures, neither before nor during frost. This attitude stems froms religious beliefs, forcing them to resign to "the will of God". They may also have an economic argument. For instance, while evaluating the cost and benefits of taking mitigating measures against frost, they find that doing nothing is economically more effective because applying fertilizer or plastic covers would results in greater expenses.

INTENSIVE RAINFALLS

NEGATIVE IMPACTS

+ Mud floods
+ Floods
+ Destruction of agricultural production
+ Pests and diseases
+ Decrease of product quality

45% Of the surveyed producers do not know of any measures to cope with flood threat.

HAILSTORMS

NEGATIVE IMPACTS

+ Crop loss
+ Destruction of fruits

The only strategy that can be applied is the use of rockets for ice melting, which have to be launched before the snow event starts.

PROFILE OF TARGET POPULATION:

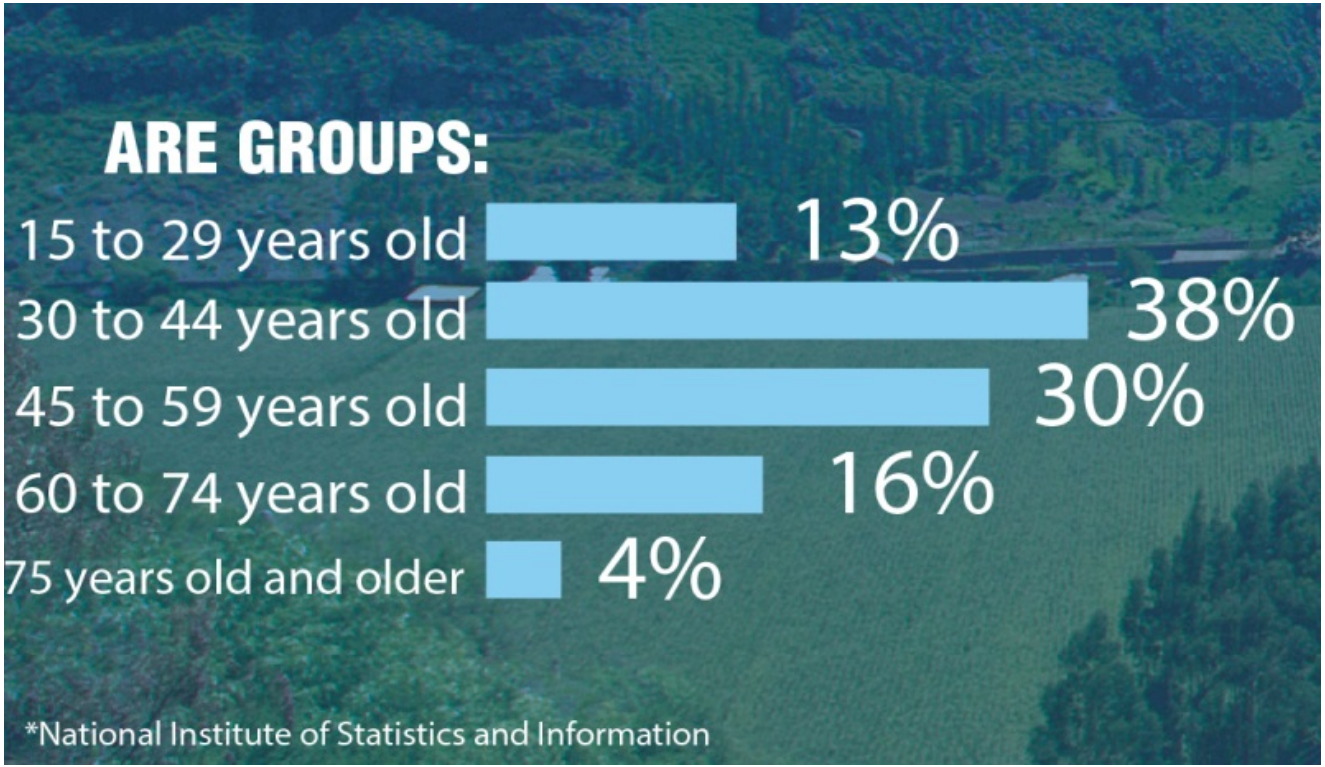
Agricultural census - Peru 2012 - Source INEI*

149,689
Producers

83%
Mother tongue
Quechua

The majority of the population only completed primary school and there is a large number of illiteracy.

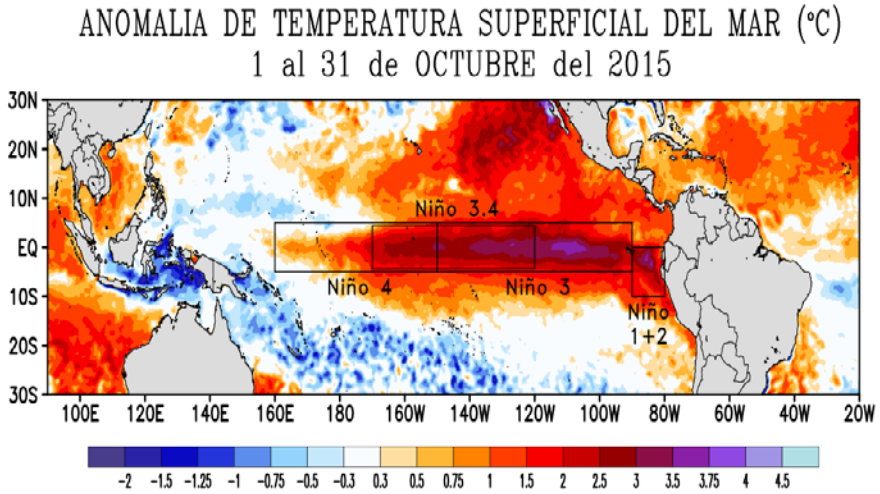
34% of women are illiterate.

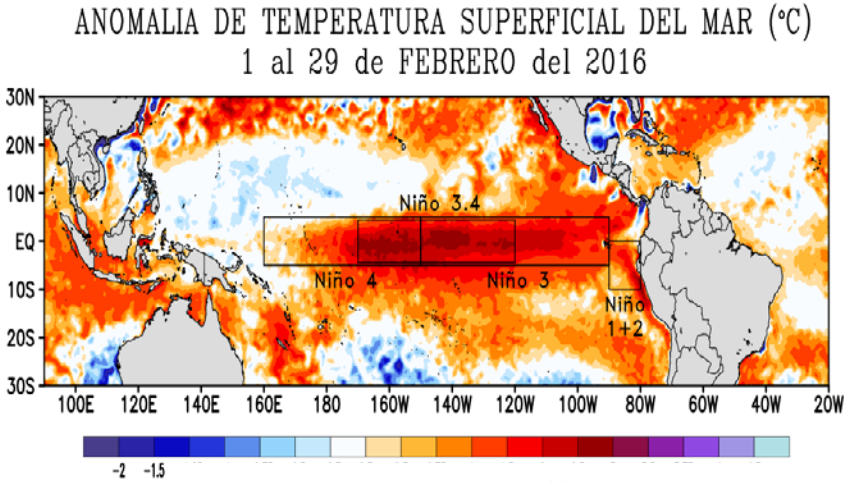

ARE GROUPS:
15 to 29 years old
13%
30 to 44 years old
38%
45 to 59 years old
30%
60 to 74 years old
16%
75 years old and older
4%
*National Institute of Statistics and Information

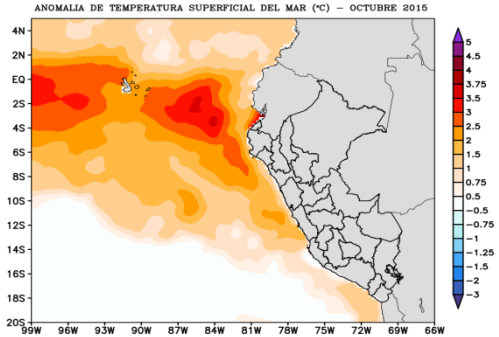
Most family are composed of **3 members**, being adult and small families, the majority state they tend to plant always the same crops and chose the culture with the lowest production costs.

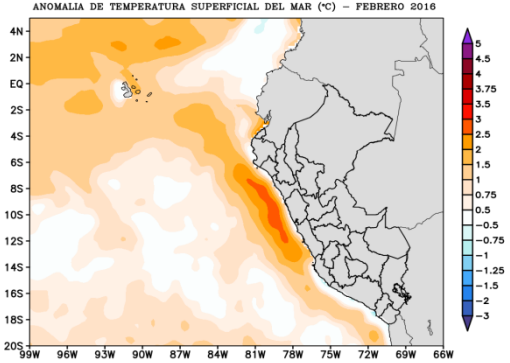
81% state that what they earn from their products does not cover their expenses, and thus need to look for alternative activities to farming.

IMPACTS OF EL NIÑO EVENT ON AGRICULTURE









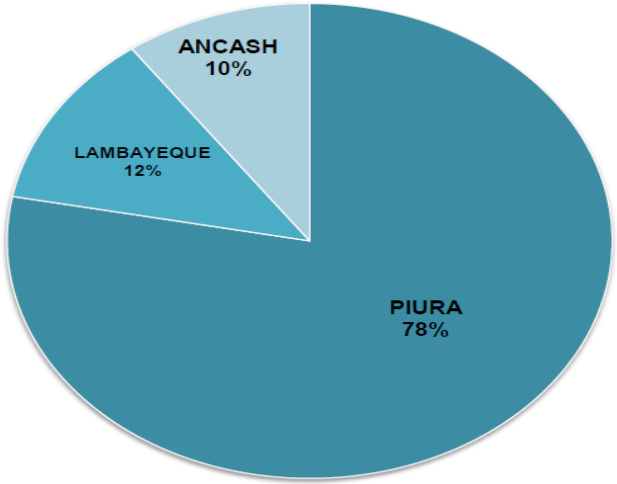
Source: AVHRR/SENAMHI

MANGO CROP SEASON

Lambayeque

SOWN AREA BY REGION

TOTAL: 27,120 Has
INEI 2014



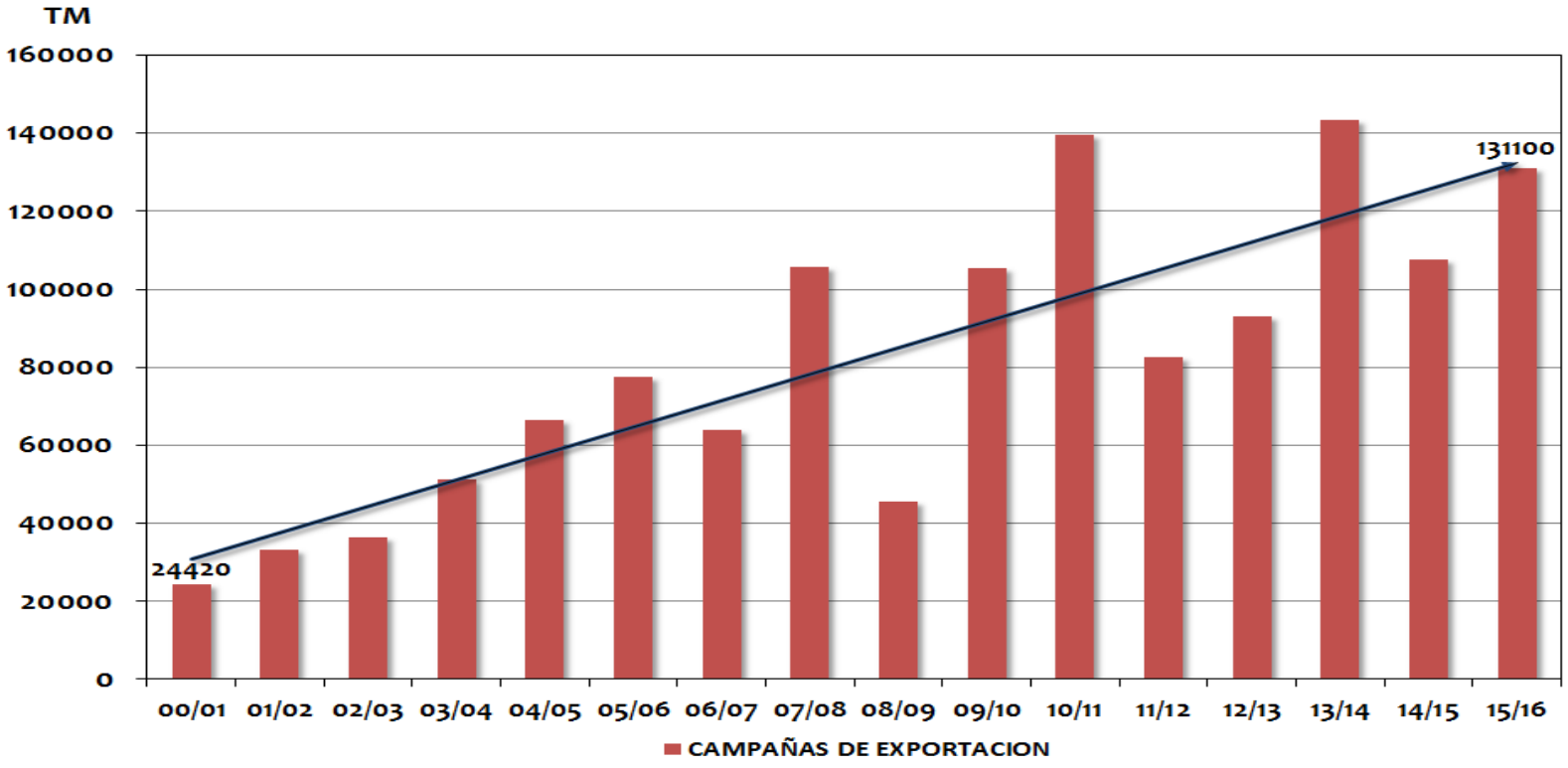
SEASONAL EXPORTATION OF PERUVIAN MANGO

North Hemisphere	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
India												
Pakistán												
México												
Indonesia												
Filipinas												
EEUU												
Costa Rica												
Costa de Marfil												
Israel												
South Hemisphere	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Brasil												
Ecuador												
Perú*												
Sudáfrica												
Madagascar												

*Periodo de producción de variedades exportables.

Source: Food and Agriculture Organization of the United Nations

HISTORICAL EXPORTS OF PERUVIAN MANGO DURING CROP SEASON



Source: SUNAT
Elaboration: SENAMHI

CHARACTERISTIC OF IMPACTS

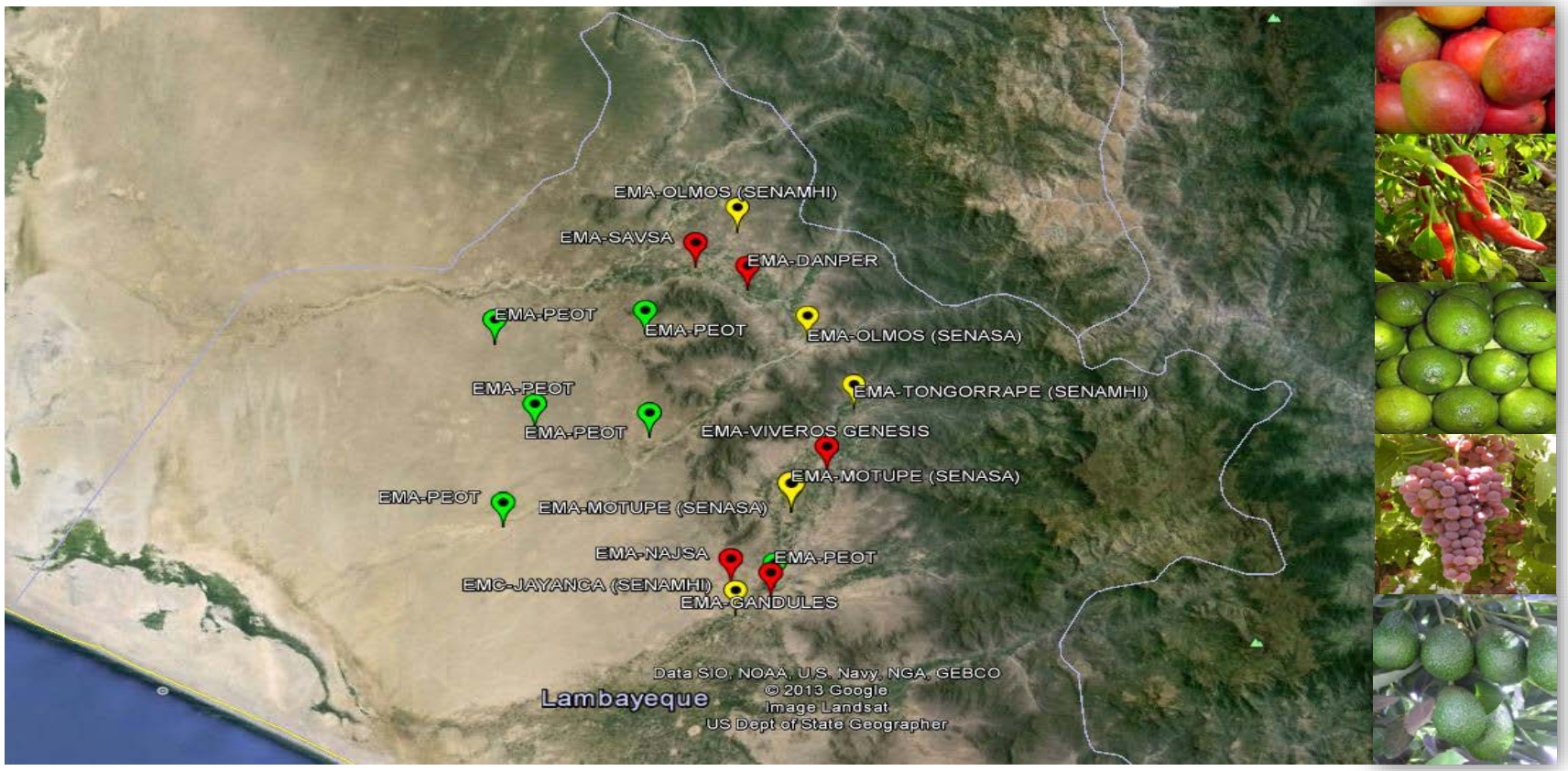
- **Vulnerability of Production to Climate Variability** → Mango's depends on:
  - Thermic factor for flowering
  - Precipitation occurrence during crop season

- **Increasing vulnerability by atomization of croplands** → Isolated croplands without technological access for climate risk management in agriculture.

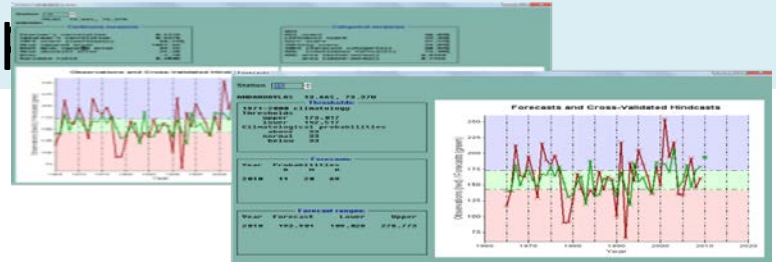
- **The impacts of El Niño events** are associated to its seasonal occurrence, intensity and duration.

CLIMATE SERVICE FOR MANGO´S CROP

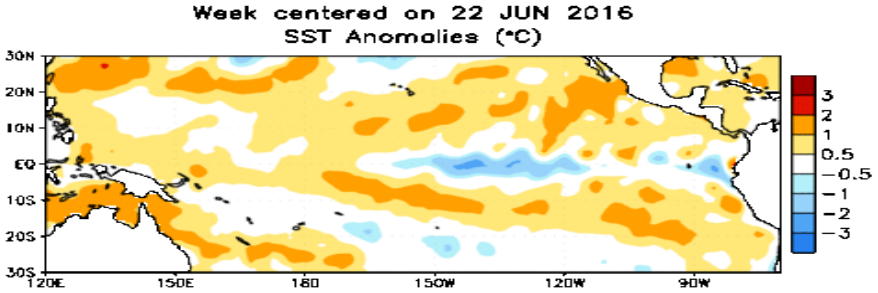
COOPERATION BY SENAMHI - SENASA – ADEX



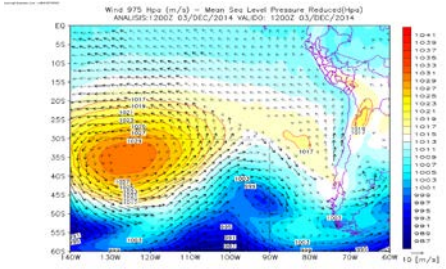
Monitoring and forecast



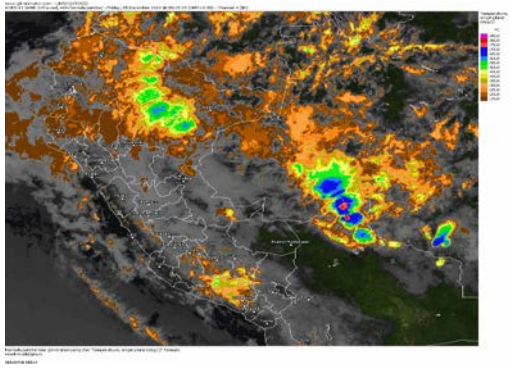
Seasonal forecast



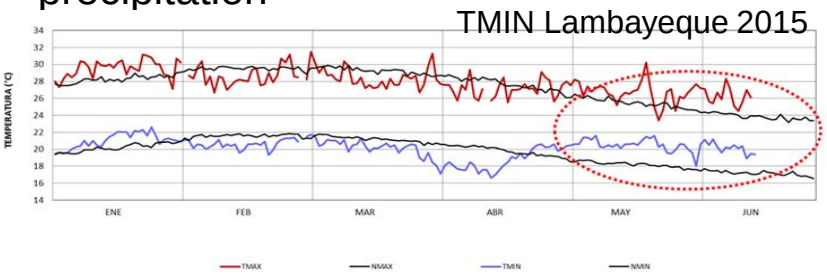
Wind



satalites



Monitoring of temperatures and precipitation



User interface: **Climate Forum**:

Lambayeque, June 2014

Lambayeque, October 2015

Phenological observation field:
SENAMHI-SENASA-FARMER

Forums with "mango" farmers
Lambayeque, octuber 2014

the weather is an important factor, but it is also important agronomic management.

MANGO CROP SEASON
2015 - 2016

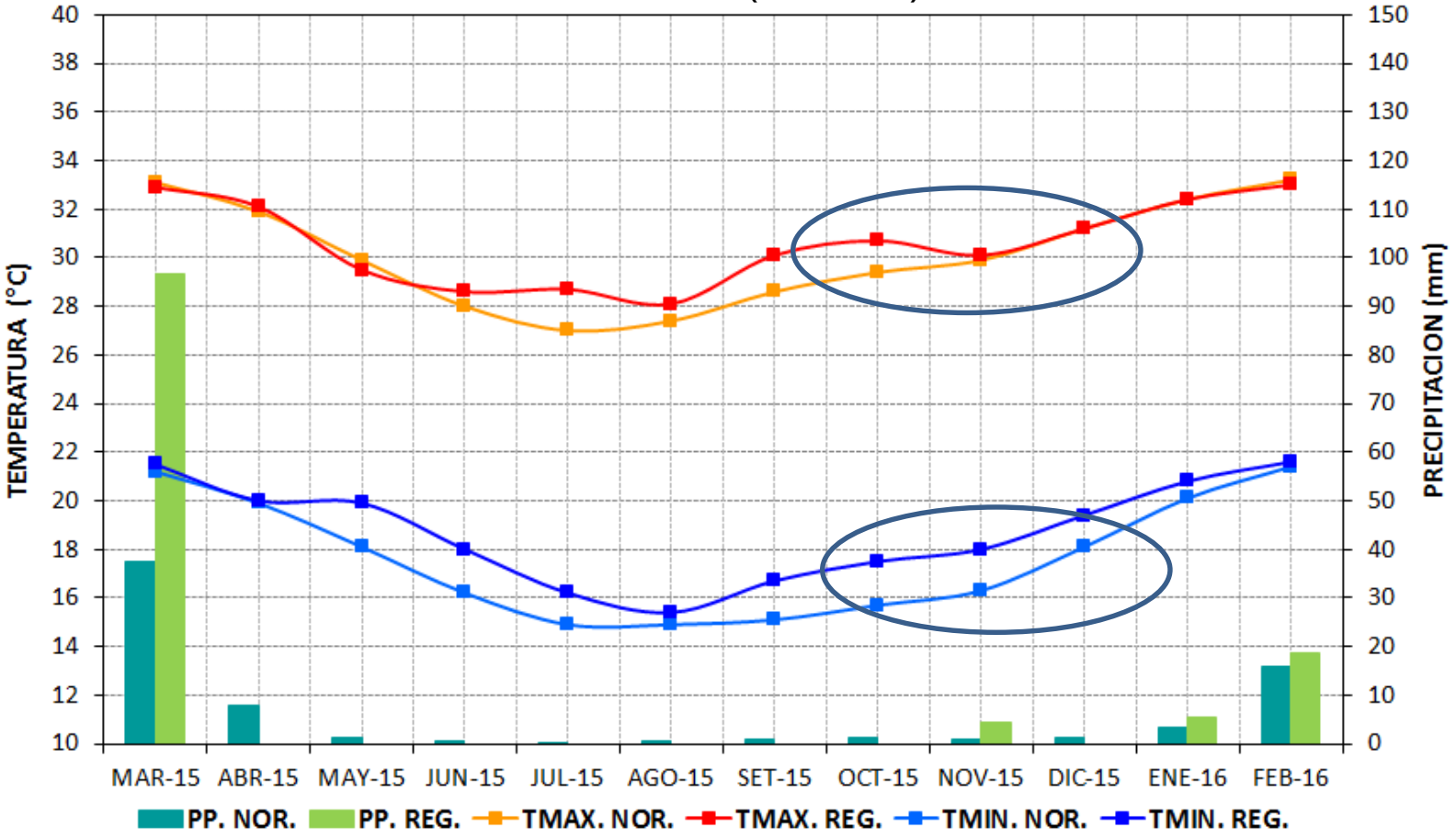
In August 2015, minor minimum temperatures anomalies (heat rating) promoted a favorable night for flowering **mango Kent** in the production areas.
Accumulation of cold days (minimum ≤ 16 ° C):

22 days → Jayanca
14 days → Olmos
12 days → Motupe

These thermal conditions coupled with floral induction strategies determine the prevalence of higher levels of bloom on the grounds compared to the crop season 2014-2015.

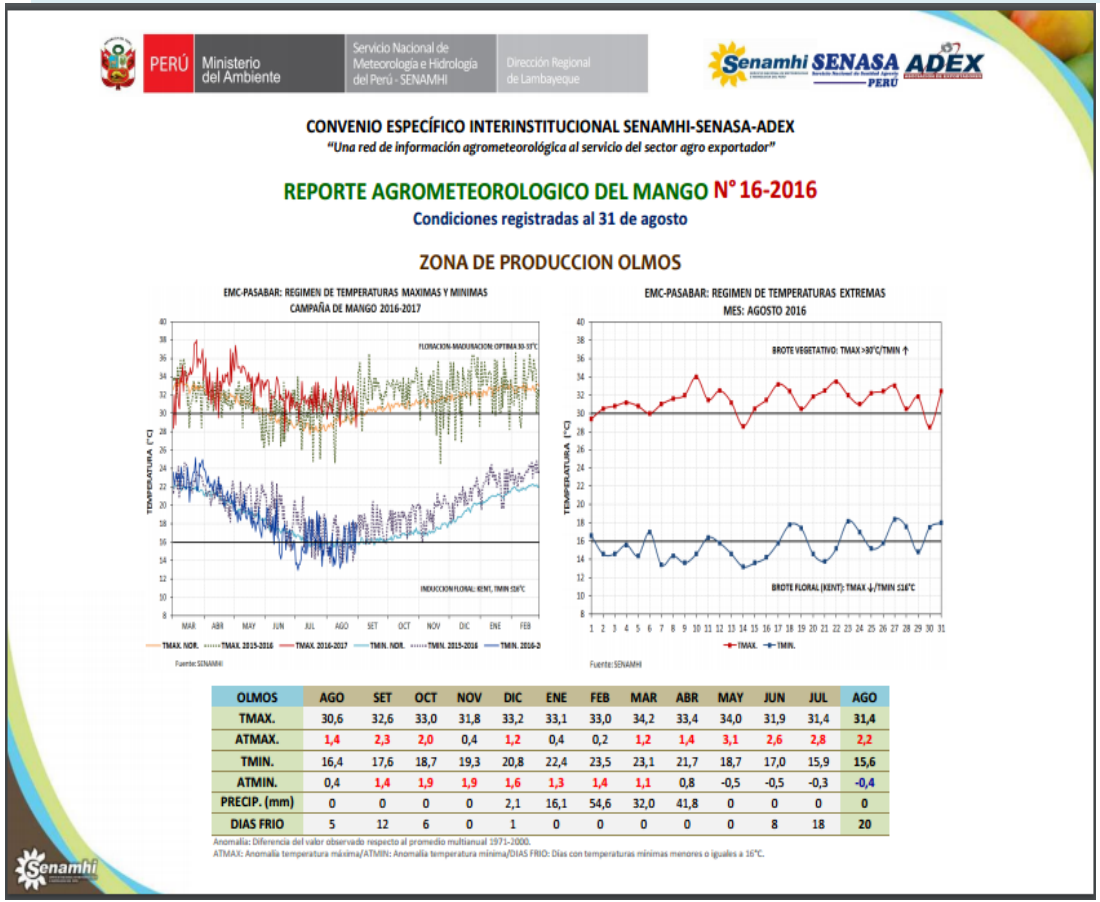
Crop season 2015 -2016: 131 were exported 000 MT

EMC-JAYANCA: EXTREME TEMPERATURES (MAX & MIN) AND PRECIPITATION
MANGO SEASON (2015-2016)



Fuente: SENAMHI

PRODUCTS and SERVICES



OLMOS	AGO	SET	OCT	NOV	DIC	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO
TMAX.	30,6	32,6	33,0	31,8	33,2	33,1	33,0	34,2	33,4	34,0	31,9	31,4	31,4
ATMAX.	1,4	2,3	2,0	0,4	1,2	0,4	0,2	1,2	1,4	3,1	2,6	2,8	2,2
TMIN.	16,4	17,6	18,7	19,3	20,8	22,4	23,5	23,1	21,7	18,7	17,0	15,9	15,6
ATMIN.	0,4	1,4	1,9	1,9	1,6	1,3	1,4	1,1	0,8	-0,5	-0,5	-0,3	-0,4
PRECIP. (mm)	0	0	0	0	2,1	16,1	54,6	32,0	41,8	0	0	0	0
DIAS FRIO	5	12	6	0	1	0	0	0	0	0	8	18	20

Anomalía: Diferencia del valor observado respecto al promedio multianual 1971-2000.
ATMAX: Anomalía temperatura máxima/ATMIN: Anomalía temperatura mínima/DIAS FRIO: Días con temperaturas mínimas menores o iguales a 16°C.

Monitoring thermal conditions for mango cultivation **(SENAMHI-SENASA-ADEX)**

Users: ADEX, 16 mango growers associations, Banks

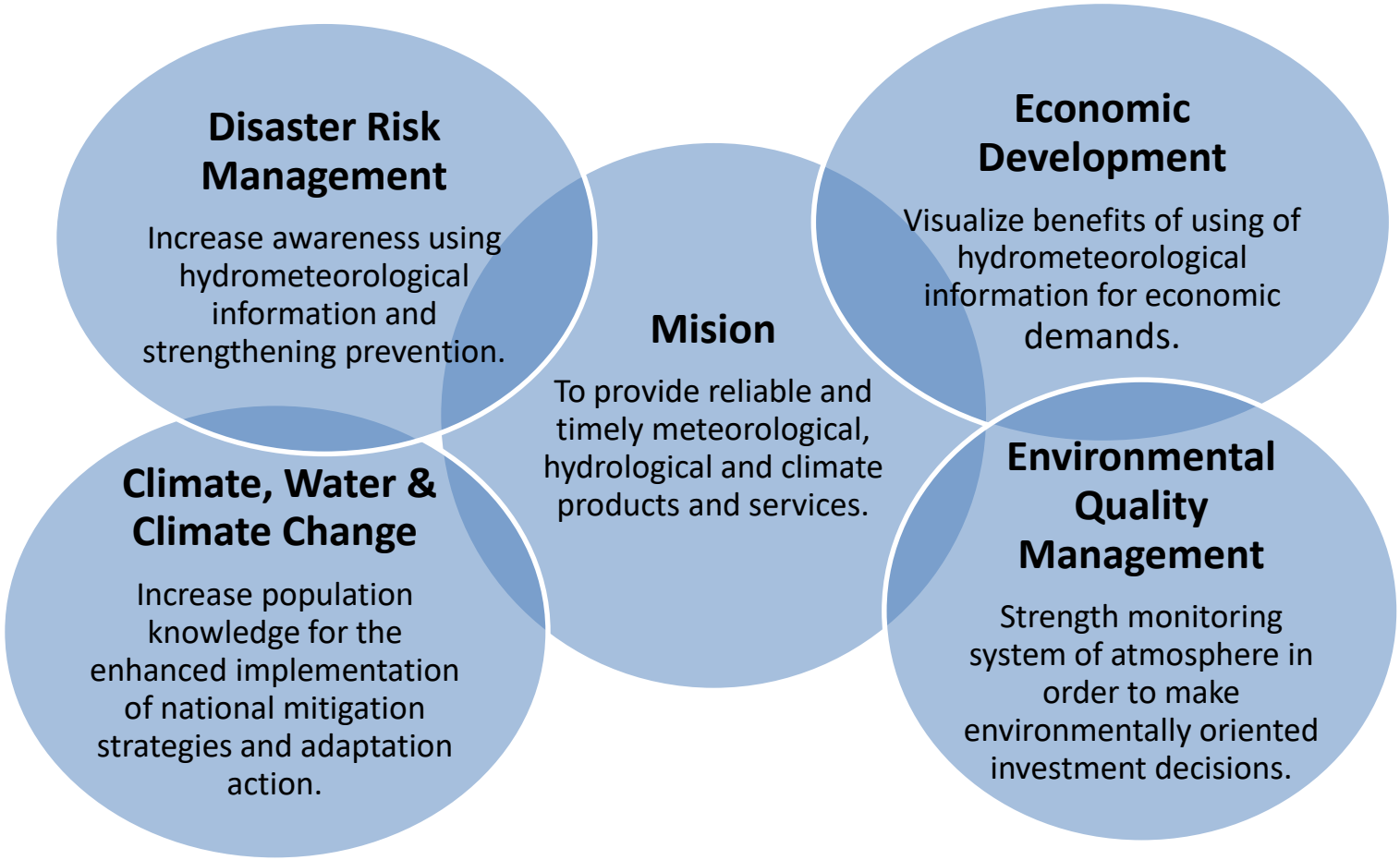
AGRICULTURA

“If SENAMHI could tell me that it will rain for 15 days, I would not have to irrigate, and thus avoid related costs. I need to know exactly which days it will rain and be assured that it will be so”.

Interviewed farmer

CHALLENGES

We want to replicate this experience in Piura which is the main producer of mango.



COOPERATION
EXPERIENCES, TOOLS FOR FORECASTING & SYNERGIES

Perú y Corea: Nuevas tecnologías de observación ante el cambio climático

Especialistas del Centro del Clima del Foro de Cooperación Económica Asia-Pacífico (cuyo nombre en inglés es APEC Climate Center o APCC), desarrollan en Lima el Taller de Entrenamiento de Herramientas de la Información Climática, cuyo fin es promover el uso regional del Climate Information Tool Kit (CLIK).

Training about:

CLIK
Climate Information Toolkit

Thank you

شكرا

谢谢

감사

感謝

Gracias