Sustainable Production and Trade of Nuts and Dried Fruit: General Overview

Mr. Pino Calcagni
Vice Chairman, Chairman of the Statistics Committee, and Scientific and Government Affairs Committee, INC International Nut and Dried Fruit Council
INC International Nut & Dried Fruit Council

- **Vision**
  - To be the international source for information on Nuts and Dried Fruits for health, nutrition, statistics, food safety, government standards and regulations regarding trade barriers and agricultural quality standards.

- **Mission**
  - To stimulate and facilitate sustainable growth in the global Nut and Dried Fruit Industry.
INC aims for

- Promoting scientific research on the health benefits of N&DF consumption.
- Cooperating with national and international institutions, such as Codex Alimentarius and UN, to further global N&DF trade.
- Being the international source of information on health, nutrition, statistics, food safety, government standards and regulations regarding trade barriers and agricultural quality standards.
- Increasing the understanding about production, trade and consumption trends worldwide.
- Promoting scientific research on the health benefits of N&DF consumption.

Helping the Nut & Dried Fruit industry to grow.

Information resources

Statistics

Industry's voice

Health & nutrition
About us

17 Products
- Almonds
- Apricot Kernels
- Brazil Nuts
- Cashews
- Hazelnuts
- Macadamias
- Pecans
- Pine Nuts
- Pistachios
- Walnuts
- Peanuts
- Dates
- Dried Apricots
- Dried Cranberries
- Dried Figs
- Prunes
- Raisins, Sultanas & Currants

- Membership: +800 companies from +75 countries.
- A Board of Trustees from 12 countries.
- Ambassadors in +30 countries.
- An international team: 15 sub-committees.

Publications
- Monthly Newsletter
- Weekly Cracking the News
- Nutfruit Magazine
- Online Database
- Statistical Yearbook
- Trade Flows World Map
- Technical Information Kits
Global Statistical Review - World Tree Nut Production

World Tree Nut Production (Metric Tons)
Kernel basis, except pistachios in-shell. Source: INC

2008/09: 3,021,606
2009/10: 2,846,705
2010/11: 3,162,592
2011/12: 3,266,480
2012/13: 3,449,223
2013/14: 3,374,755
2014/15: 3,589,746
2015/16: 3,775,289
2016/17: 4,215,515
2017/18: 4,238,408
2018/19*: 4,468,228

*Forecast

- Almonds
- Walnuts
- Cashews
- Pistachios
- Hazelnuts
- Pecans
- Macadamias
- Brazil Nuts
- Pine Nuts
- World Total
Global Statistical Review - World Tree Nut Production

World Tree Nut Production (Metric Tons)
Kernel basis, except pistachios in-shell. Source: INC

- USA
- Turkey
- China
- India
- Cote Ivoire
- Iran
- Others

*Forecast
Consuming countries classified according to their gross national income (GNI) *per capita*, using the World Bank Atlas method:

- **High-Income Economies**: GNI *per capita* of $12,746 or more (Australia, Chile, Europe, USA…)
- **Middle-Income Economies**: (includes both Lower-Middle-Income Economies and Upper-Middle-Income Economies): GNI *per capita* from $1,046 to $12,746 (China, Cote d'Ivoire, India, South Africa…)
- **Low-Income Economies**: GNI *per capita* of $1,045 or less (Afghanistan, Burkina Faso, Kenya, Zimbabwe…)

*Gross National Income *per capita*
Global Statistical Review - World Dried Fruit Production

World Dried Fruit Production (Metric Tons)
Source: INC

- Dried Grapes
- Table Dates
- Prunes
- Dried Apricots
- Dried Figs
- World Total

*Forecast
Global Statistical Review - World Dried Fruit Production

World Dried Fruit Production (Metric Tons)

Source: INC

- Turkey
- Iran
- USA
- Saudi Arabia
- China
- Others

*Forecast
Global Statistical Review - World Dried Fruit Production

Turkey 2017/18 Dried Fruit Production (Metric Tons) Source: INC

- Dried Grapes 58%
- Dried Apricots 27%
- Dried Figs 15%

Iran 2017/18 Dried Fruit Production (Metric Tons) Source: INC

- Dried Grapes 36%
- Dried Apricots 9%
- Table Dates 49%
- Dried Figs 6%

USA 2017/18 Dried Fruit Production (Metric Tons) Source: INC

- Dried Grapes 63%
- Prunes 28%
- Table Dates 6%
- Dried Figs 3%
- Dried Apricots <1%

China 2017/18 Dried Fruit Production (Metric Tons) Source: INC

- Dried Grapes 96%
- Dried Apricots 4%
Consuming countries classified according to their gross national income (GNI) *per capita*, using the World Bank Atlas method:

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- **Middle-Income Economies**: (includes both Lower-Middle-Income Economies and Upper-Middle-Income Economies): GNI *per capita* from $1,046 to $12,746 (China, Cote d'Ivoire, India, South Africa…)
- **Low-Income Economies**: GNI *per capita* of $1,045 or less (Afghanistan, Burkina Faso, Kenya, Zimbabwe…)

*Gross National Income *per capita*
Supply value: estimated as the tree nut and dried fruit production per its unitary price, customs paid upon arrival in Europe.
Global Statistical Review- Supply Value

Tree Nut Supply Value (Million $)
Kernel basis, except pistachios in-shell. Source: INC

Tree Nut Supply Value (Million $)
Kernel basis. Source: INC
Global Statistical Review- Supply Value

Dried Fruit Supply Value (Million $).
Source: INC

- Table Dates
- Dried Grapes
- Dried Apricots
- Prunes
- Dried Figs

Year: 2007/08 to 2017/18

- Table Dates: 1,855 to 558
- Dried Grapes: 1,921 to 641
- Dried Apricots: 370 to 703
- Prunes: 3,588 to 2,287
- Dried Figs:
Annually, over 2.3 million metric tons of tree nuts and 2 million MT of dried fruits are traded around the world.

### Tree Nut Exports (Metric Tons)

<table>
<thead>
<tr>
<th>Tree Nut</th>
<th>Exports (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almonds</td>
<td>895,928</td>
</tr>
<tr>
<td>Cashews</td>
<td>496,019</td>
</tr>
<tr>
<td>Pistachios</td>
<td>360,964</td>
</tr>
<tr>
<td>Walnuts</td>
<td>219,984</td>
</tr>
<tr>
<td>Hazelnuts</td>
<td>209,244</td>
</tr>
<tr>
<td>Pecans</td>
<td>60,563</td>
</tr>
<tr>
<td>Macadamias</td>
<td>31,187</td>
</tr>
<tr>
<td>Brazil Nuts</td>
<td>29,477</td>
</tr>
<tr>
<td>Pine Nuts</td>
<td>21,575</td>
</tr>
<tr>
<td><strong>World Total</strong></td>
<td><strong>2,324,941</strong></td>
</tr>
</tbody>
</table>

### Dried Fruit Exports (Metric Tons)

<table>
<thead>
<tr>
<th>Dried Fruit</th>
<th>Exports (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dates</td>
<td>913,327</td>
</tr>
<tr>
<td>Dried Grapes</td>
<td>758,071</td>
</tr>
<tr>
<td>Prunes</td>
<td>192,775</td>
</tr>
<tr>
<td>Figs</td>
<td>124,103</td>
</tr>
<tr>
<td>Dried Apricots</td>
<td>95,111</td>
</tr>
<tr>
<td><strong>World Total</strong></td>
<td><strong>2,083,386</strong></td>
</tr>
</tbody>
</table>

Sources: DESA/UNSD UN Comtrade Database and Eurostat, Comext (2016)
Dried Fruit Export Flows

© INC International Nut and Dried Fruit Council

Countries are either dried or preserved (IC code 0811 01).

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Global Statistical Review

Almonds support
- **California**: 6,800 farms (75% are 40 ha or less)
- **Australia**: 150 farms (74% family owned of 100 ha or less)
- **Spain**: 100,000 farmers, 2,000 processing employees

Brazil Nuts support
- **South America**: 150,000 people

Cashews support
- **Africa**: 10 million people in 14 countries
- **Vietnam**: +900,000 workers involved in raw cashew nut processing and kernel trade industry

Pine Nuts support
- **China**: 550,000 people
- **Afghanistan** and **Pakistan**: 200,000 people
- **Russia**: 40,000 people

Dried grapes support
- **Turkey**: 60,000 growers
- **Iran**: 150,000-200,000 people involved

Hazelnuts support
- **In Turkey**
  - 450,000 growers’ families and 2 million people involved indirectly
  - 25,000 processing facilities employees
  - 80,000 manufacturing industry employees
  - 12,000 people involved in logistic and distribution
  - 3,000 people involved in trading
- **In Oregon (USA)**
  - 800 growers’ families
  - 140 processing facilities employees
- **In Iran**
  - 6,581 people involved in irrigated production
  - 1,890 people involved in rainfed production and 7,561 indirectly
UN Sustainable Development Goals (SDGs)

Food and agriculture can help achieve multiple SDGs
UN Sustainable Development Goals (SDGs)

Food and agriculture can help achieve multiple SDGs

1. No Poverty
2. Zero Hunger
3. Good Health and Well-Being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace, Justice and Strong Institutions
17. Partnerships for the Goals

1FAO. 2018. Transforming food and agriculture to achieve the SDGs
Sustainable Agriculture

Meet the present needs without compromising the ability to meet future needs

FAO’s FIVE KEY PRINCIPLES

1. Increase productivity, employment and value addition in food systems
2. Protect and enhance natural resources
3. Improve livelihoods and foster inclusive economic growth
4. Enhance the resilience of people, communities and ecosystems
5. Adapt governance to new challenges
Sustainable Agriculture

**Stewardship of both natural and human resources**

<table>
<thead>
<tr>
<th>Natural resources</th>
<th>Human resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Promote soil health</td>
<td>• Working and living conditions of laborers</td>
</tr>
<tr>
<td>• Promote biodiversity</td>
<td>• Needs of rural communities</td>
</tr>
<tr>
<td>• Minimize water use</td>
<td>• Consumer health and safety</td>
</tr>
<tr>
<td>• Minimize pollution levels</td>
<td></td>
</tr>
</tbody>
</table>

**Research:** practices more productive and profitable, new varieties

**Education:** Help growers to adopt sustainable practices

**Government:** creation of an enabling policy environment, collaboration and stakeholder dialogue.
Objective: identify sustainability practices implemented in the tree nut and dried fruit industry

Questions:

1. Which agricultural practices towards a more sustainable agriculture have recently been incorporated (or are already part of the agricultural system) in your producing area?

2. Both in irrigated or rainfed agricultural systems, how has water use efficiency been improved in your region/country?

3. Is there any governmental or NGO’s programs in your producing area aiming to achieve gender equality/inclusive, full and productive employment/foster industry innovation and infrastructure?

4. Are renewable energies part of your area production systems?
### Sustainable Practices

#### Almonds (USA)

**Agricultural practices**

- **California Almond Sustainability Program (CASP):**
  - About 23% is assessed using the various CASP self-assessment modules.
  - What they are doing now is:
    1. To finalize a “SAI module” which growers can utilize to see how their practices compare with the SAI assessment.
    2. To develop an “opt in” system where growers can share data, on an aggregated basis, with their handler.
### Cashew (Brazil)

#### Agricultural practices
- Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat **desertification**, and halt and reverse land degradation and halt **biodiversity loss**.
- Strengthen the means of implementation and revitalize the global partnership for sustainable development.

#### Water use efficiency
- The producers/farmers are trained to use water efficiently.
- Brazil suffer a lot with draughts and irrigation is not yet an option (too expensive).

#### Programs
- Government initiative called **Embrapa** which makes studies to improve the lands and work in new technicians for the cashew culture.

#### Renewable energies
- Only on the processing plants.

#### Others
- Ensure healthy lives and promote well-being.
- Ensure education and promote lifelong learning opportunities.
- Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
<table>
<thead>
<tr>
<th></th>
<th>Turkey:</th>
<th>Georgia:</th>
<th>USA:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agricultural</strong></td>
<td><strong>Rejuvenation</strong> of the current orchards</td>
<td>Start using improved agricultural practices.</td>
<td>Growers and industry participate in a <strong>sustainability program</strong>.</td>
</tr>
<tr>
<td><strong>practices</strong></td>
<td>– Good farming practices.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Water use</strong></td>
<td>– As crops are mainly built based on rainfed systems, there is not</td>
<td>– If irrigation is used, it is primarily a <strong>drip system</strong>.</td>
<td>– If irrigation is used, it is primarily a <strong>drip system</strong>.</td>
</tr>
<tr>
<td><strong>efficiency</strong></td>
<td>initiatives towards water use efficiency.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Programs</strong></td>
<td>– There are many independent initiatives.</td>
<td>– Different social projects aiming to achieve gender equality.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
<td>– It is <strong>needed to be more productive</strong> before going to the next</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>stage which is the sustainable development.</td>
</tr>
</tbody>
</table>
## Sustainable Practices

### Macadamias

<table>
<thead>
<tr>
<th></th>
<th>South Africa</th>
<th>Brazil</th>
</tr>
</thead>
</table>
| **Agricultural practices** | Integrated Pest Management.  
- Water management.              |                                                                               |
| **Water use efficiency**     | Low flow *drip irrigation* – 50% less water is now used.                      | Brazilian work law ensures gender and race equality/inclusive.               |
| **Programs**           | The South African Cabinet has approved a new minimum wage bill that would see that workers will earn more market-related salaries. | Brazilian *Forest Code*, there is a national law which requires that 20-80% (depending where it is situated) of the farms to be native forest. |
| **Renewable energies** | Solar power.                                                                  | Macadamia’s shells are burnt to generate heat.                               |
| **Others**            | Through funds that *SAMAC* has received from Farmers and Handlers, it is able to provide bursaries for previous disadvantaged students and assists upcoming farmers. | Solar heat is used to dry nut in-shell.                                      |
### Sustainable Practices

#### Agricultural practices
- Conversion from flood irrigation to sprinkler and micro sprayers.
- Less use of round-up herbicide.
- More use of composted manure.
- **Global Gap** is implemented in some areas.

#### Water use efficiency
- More use of sprinkler vs. flood irrigation.
- Irrigation monitoring system.
- Drip upgrades.

#### Programs
- Pecan shell.
- Solar energy on farms and in production facilities.
- Government Land Redistribution Program
- Government programs for industry innovation and infrastructure.

#### Renewable energies
- Solar energy.

#### Others
- Education opportunities through government funded programs.
## Sustainable Practices

### Pistachios (USA)

| **Agricultural practices** | Installation of fuel cells.  
|                            | **New pistachio varieties more efficient** (same water – 30% higher yield).  
|                            | Hull bio-matter is recycled as **cattle feed**. |
| **Water use efficiency**  | Agricultural **waste water is recycled** back on to the orchards as agricultural irrigation water. |
| **Programs**              | Investments in far-reaching community development, education, and health and wellness programs across California’s Central Valley, all with the goal of enriching and enhancing the lives of employees, their families and their communities.  
|                            | Infrastructure improvements.  
|                            | Affordable single-family homes. |
| **Renewable energies**    | **Solar energy** in processing facilities.  
|                            | Pistachio **shells** are sold to electrical utilities. |
## Sustainable Practices

### Walnuts

<table>
<thead>
<tr>
<th></th>
<th>China:</th>
<th>USA:</th>
<th>Chile:</th>
</tr>
</thead>
</table>
| **Agricultural practices** | - Mechanical harvest for commercial orchards, especially for hulling and drying.  
- To provide technics for farmers/growers in the area of irrigation, variety and management etc. | - Their commitment to sustainability is deeply rooted.  
- Informed by science and advanced with the help of new technologies and innovations to reduce the impacts on the environment. | - APL (Clean Production Agreement) is being developed to achieve sustainability at the orchards and processing facilities. |
| **Water use efficiency** | - Drip irrigation system in flat areas.                                  | - Continuous improvements to lessen the impacts.                       | - Improvements in irrigation systems.                                   |
| **Programs**          | - Government policy to get rid of poverty and to achieve prosperity for the poor areas and regions.  
- Policy for equality between man and woman.               |                                                                        | - There is a special office called FIA, an organism focused on promoting innovation programs for the industry. |
| **Renewable energies** |                                                                        |                                                                        | - Solar energy (only some companies).                                   |
### Sustainable Practices

#### Walnuts

<table>
<thead>
<tr>
<th><strong>Agricultural practices</strong></th>
<th>Moldova</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Cultivating lands using <strong>no-till/mini-till technologies</strong>.</td>
<td></td>
<td>– <strong>Sexual Confusion</strong> to reduce the use of pesticides.</td>
</tr>
<tr>
<td>– Cultivating by using the sustainable lands management practices.</td>
<td></td>
<td>– Measurement of light with a Photosynthetically Active Radiation system to decide exact pruning and foliar feeding.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Water use efficiency</strong></th>
<th>Moldova</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Extension of irrigated agricultural lands-renewed centralized irrigation systems- by <strong>dripping</strong> -by <strong>spraying</strong>.</td>
<td></td>
<td>– <strong>Pressure Chamber</strong> to determine the exact quantity of water for irrigation.</td>
</tr>
<tr>
<td>– The project &quot;Improvement of the water supply infrastructure in the central region of the Republic of Moldova&quot; is in under way.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Programs</strong></th>
<th>Moldova</th>
<th>Italy</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Renewable energies</strong></th>
<th>Moldova</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Current energy efficiency projects under the &quot;Energy and Biomass in Moldova&quot; Project.</td>
<td></td>
<td>– <strong>Solar energy</strong>.</td>
</tr>
<tr>
<td>– The subsidy program for biomass boilers has been launched.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Sustainable Practices

### Dates (Tunisia)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agricultural practices</strong></td>
<td>– Protection of date bunches by <strong>nets</strong> makes possible to avoid chemical treatments against insects.</td>
</tr>
<tr>
<td></td>
<td>– Almost all farmers use <strong>organic fertilizers</strong>.</td>
</tr>
<tr>
<td><strong>Water use efficiency</strong></td>
<td>– Increased use of <strong>localized irrigation</strong> especially in new plantations</td>
</tr>
<tr>
<td><strong>Programs</strong></td>
<td>– Government incentives for investment and job creation in production areas.</td>
</tr>
<tr>
<td></td>
<td>– Existence of NGOs working in the field of gender equality and inclusive employment.</td>
</tr>
<tr>
<td><strong>Renewable energies</strong></td>
<td>– Increment in the use of <strong>solar energy</strong> for pumping water.</td>
</tr>
</tbody>
</table>
**Sustainable Practices**

### Dried Apricots (Turkey)

<table>
<thead>
<tr>
<th><strong>Agricultural practices</strong></th>
<th>Organic production and <strong>Good Agricultural Practices</strong> have been incorporated in our producing area.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Programs</strong></td>
<td>There are government and NGOs support for Women, young and disadvantaged entrepreneurs.</td>
</tr>
<tr>
<td><strong>Renewable energies</strong></td>
<td>Turkish dried apricots naturally dried under the sun. Solar energy is used in some production facilities.</td>
</tr>
</tbody>
</table>

### Dried Figs (Turkey)

<table>
<thead>
<tr>
<th><strong>Agricultural practices</strong></th>
<th>Organic production and Good Agricultural Practices have been incorporated in our producing area.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water use efficiency</strong></td>
<td><strong>Irrigation Ponds</strong> have been built in dried fig production area.</td>
</tr>
<tr>
<td><strong>Programs</strong></td>
<td>There are government and NGOs support for Women, young and disadvantaged entrepreneurs.</td>
</tr>
<tr>
<td><strong>Renewable energies</strong></td>
<td>Turkish dried apricots naturally dried under the sun. Solar energy is used in some production facilities.</td>
</tr>
</tbody>
</table>
### Prunes (USA)

| **Agricultural practices** | - Soil health management.  
|                           | - There is a focus on tree health and improvement through research studies to advance the sustainability of the trees. |
| **Water use efficiency**  | - Utilization of technologies to monitor the soil moisture content in order to effectively irrigate orchards.  
|                           | - Improved irrigation techniques. |
| **Renewable energies**    | - Solar power.  
|                           | - Reducing the amount of energy by recycling steam in our plants. |
| **Others**                | - Utilization of by-products for cattle feed.  
|                           | - Deriving the natural oil from the pits that has multiple uses.  
|                           | - Installation of high efficiency lighting in the plants to reduce electricity usage.  
|                           | - Recycling packaging waste – reducing landfill.  
|                           | - Lightweight packaging – over 10% reduction in tree fiber consumption.  
|                           | - Converting packaging to 100% recyclability.  
|                           | - Excellent employee working conditions. |
## Sustainable Practices

### Dried Grapes

<table>
<thead>
<tr>
<th></th>
<th>Turkey:</th>
<th>Chile:</th>
<th>USA:</th>
</tr>
</thead>
</table>
| **Agricultural practices** | - Organic production and **Good Agricultural Practices** have been incorporated in our producing area. | - **Global Gap.**  
- Some growers have made investments for the proper use of water and energy.                                      | - Higher minimum wage.  
- Equal opportunity, many female workers.  
- Public education is available to everyone.  
- Children must attend school and are not allowed to work.  
- Mechanical Harvesting which provides more year-round work at higher wages. |
| **Water use efficiency**  | - Irrigation Ponds have been built.                                     | - **Drip** irrigation (90% growers).                                                             | - **Drip** irrigation.  
- Water management programs.                                                                                       |
| **Programs**           | - Government and NGOs support for women, young and disadvantaged entrepreneurs. | - Governmental initiative for employing a % of disabled people.                                    | - Economic Employment Opportunity Commission.                                                     |
| **Renewable energies**  | - Turkish dried apricots naturally dried under the sun.  
- **Solar energy** in some production facilities.                                                                  | - The government launched a national wide program to develop **solar energy.**                    | - **Solar energy.**  
- **Hydroelectric** power.                                                                                         |
Sustainable Practices

To sum up:

- There are big differences between countries in terms of sustainability.
- Farmers became more aware of their positive impact in both the environment and the crops.
- In general, water use efficiency is being improved through more efficient irrigation systems.
- Concerning renewable energies, solar power systems (photovoltaic panels) are being implemented in farms and production facilities all over the producing countries. Furthermore, nut shells are being used as biomass fuel for power generation.
- By-products (e.g. husks) are being repurposed as cattle feed, reducing waste and indirectly, CO₂ emissions.
Challenges on Sustainability

- Labor standards
- Low yields
- Climate change
- Transparency
Conclusions

Making the transition to sustainable agriculture is a process that requires a series of small and realistic steps.

Each small decision can make a difference and contribute to advancing the entire system.

*The key to moving forward is the will to take the next step*
Thank you.