Food and Agriculture Organization of the United Nations

Why bees matter

The importance of bees and other pollinators for food and agriculture

20 May

With the support of

REPUBLIC OF SLOVENIA
MINISTRY OF AGRICULTURE, FORESTRY AND FOOD

World Bee Day presents an opportunity to recognize the role of beekeeping, bees and other pollinators in increasing food security, improving nutrition and fighting hunger as well as in providing key ecosystem services for agriculture

José Graziano da Silva
FAO Director-General

KEY FACTS AND FIGURES

Three out of four crops across the globe producing fruits or seeds for human use as food depend, at least in part, on pollinators.

Improving pollinator density and diversity boosts crop yields – pollinators affect 35 percent of global agricultural land, supporting the production of 87 of the leading food crops worldwide.

Pollinator-dependent food products contribute to healthy diets and nutrition.

Pollinators are under threat – sustainable agriculture can reduce risk to pollinators by helping to diversify the agricultural landscape and making use of ecological processes as part of food production.

Safeguarding bees safeguards biodiversity: the vast majority of pollinators are wild, including over 20 000 species of bees.

FAO plays a leading role in facilitating and coordinating the International Pollinators Initiative 2.0

TINY MIRACLE WORKERS

Pollination is vital to life on our planet. Bees and other pollinators have thrived for millions of years, ensuring food security and nutrition, and maintaining biodiversity and vibrant ecosystems for plants, humans and the bees themselves.

Pollinators are essential to the production of many of the micro-nutrient rich fruits, vegetables, nuts, seeds and oils we eat. In fact, close to 75 percent of the world's crops producing fruits and seeds for human consumption depend, at least in part, on pollinators for sustained production, yield and quality. The diversity of food available is largely owed to animal pollinators. But alarmingly, in a number of regions, pollination services are showing declining trends.

In the past, this service was provided by nature at no apparent cost. As farm fields have become larger, agricultural practices have also changed, focussing on a narrower list of crops and increasing the use of pesticides. Mounting evidence points to these factors as causes to the potentially serious decline in populations of pollinators. The decline is likely to impact the production and costs of vitamin-rich crops like fruits and vegetables, leading to increasingly unbalanced diets and health problems, such as malnutrition

and non-communicable diseases. Maintaining and increasing yields in horticultural crops under agricultural development is important to health, nutrition, food security and better incomes for smallholder farmers.

The process of securing effective pollinators to 'service' agricultural fields is proving difficult to engineer, and there is a renewed interest in helping nature provide pollination services through practices that support wild pollinators.

BIRDS, BEES, BATS AND MORE

So, what are they? Everyone knows about the bees, and there are some 20 000 species of wild bees that pollinate plants but it may come as a surprise to know that moths, flies, wasps, beetles and butterflies as well as some animals pollinate plants. Vertebrate pollinators include bats, non-flying mammals, including several species of monkey, rodents, lemur, tree squirrels, olingo and kinkajou, and birds such as hummingbirds, sunbirds, honeycreepers and some parrot species.

The abundance and diversity of pollinators ensures the sustained provision of pollination services to multiple types of plants and leads to better food.

POLLINATION:

INVISIBLE TO THE EYE BUT YIELDING GREAT RETURNS IN AGRICULTURE

Pollination is the highest agricultural contributor to yields worldwide, contributing far beyond any other agricultural management practice. Thus, bees and other pollinators make important contributions to agriculture. Pollinators affect 35 percent of global agricultural land, supporting the production of 87 of the leading food crops worldwide. Plus, pollination-dependent crops are five times more valuable than those that do not need pollination. The price tag of global crops directly relying on pollinators is estimated to be between US$235 and US$577 billion a year. And their quantity is on the rise. The volume of agricultural production dependent on pollinators has increased by 300 percent in the last 50 years. These figures reflect the importance that pollinators have in sustaining livelihoods across the planet. Several of the crops produced with pollination, cocoa and coffee, to name two examples, provide income for farmers, in particular smallholder farmers and family farms, especially in developing countries.

Bees can, in a sense, be considered as livestock. With the increasing commercial value of honey, bees are becoming a growing generator of income, livelihood strategy and means of food security for many small-scale producers and forest dwellers in many developing countries.

Clearly, the benefits that bees and other small pollinators bring us go beyond human food. Thanks to these pollinators, farm animals have diverse forage sources and hence more flexibility to adapt to an increasingly changing climate. And we also have certain medicines, biofuels, fibres and construction materials. Some species also provide materials such as beeswax for candles and musical instruments. So embedded in our lives, bees and other pollinators have long inspired art, music and even sacred passages.

HONEY - LIFE'S SWEETENER

In the past, honey was only considered a sweetener, whereas today we know that it contains many beneficial substances. It is an excellent nutrient and calmative. Owing to its antibacterial and antioxidant properties, it is widely used in folk medicine.

Honey does not require additional processing and a beekeeper does not add anything nor take anything away from it. While mature honey loses some of its nutritional value, it still remains a superior sweetener for many decades, especially compared to plain sugar.

How quickly bioactive substances are lost depends on the temperature and other storage conditions. If honey is stored at room temperature, it remains unspoiled for at least two years, and even longer if stored in dry, cool and dark spaces.

Honey crystallizes with time. This is a natural process that neither causes any chemical changes nor affects its quality. Crystallized honey can be liquified in a water bath; the temperature, however, must not exceed 40 °C. If honey is overheated, biologically active substances are lost.

Honey can be mixed into different drinks, for example tea, milk, yoghurt or natural juices. It can be added to various baked or cooked dishes (cakes, sauces, vegetables, meats), usually to infuse them with its special aroma. Honey can fully replace consumer sugar in our diet.

Jošt Gantar

LIFE ON THE FARM

Natural habitats, forests and protected areas are usually thought to support greater biodiversity than do neighbouring agroecosystems. But this may not be the case with pollinators – under some management practices, their density and diversity can be even greater on farms than in adjacent wild areas. For instance, contrary to expectations, higher bee diversity was found in the open agricultural areas in western Kenya compared to the nearby Kakamega Forest, one of the country's most species-rich tropical rainforests. The bee fauna in the farms neighbouring Kakamega Forest may be less threatened by human factors. After crops are harvested the land is left fallow until the next season, enhancing the growth of herbs and shrubs, which provide rich food sources for bees. In addition, farmers around the forest do not to overuse chemicals such as fungicides, insecticides and herbicides.

With improved pollination management, crop yields could be further increased by about 25 percent. By ensuring higher yields and successful agricultural production, pollinators would contribute significantly to world food security and nutrition for a growing global population, along with ending poverty and hunger.

So, well managed farms can provide good habitats for bees, who, in turn, provide pollination services for agricultural production.

Marko Šinkovec

AND ALSO IN CITIES

Furthermore, urban beekeeping, or beekeeping in cities, is also very beneficial for bees. The quality of honey produced in cities is very high. This type of beekeeping is growing in popularity around the globe, and the number of urban beekeepers

is rising by no less than 200 percent each year. But this is nothing new for Slovenia – the town of Idrija has had a municipal apiary for nearly 100 years.

City parks, little gardens around apartment buildings and flower beds provide bees with diverse pastures throughout the year. Urban beekeeping is beneficial for the environment, because bees effectively take care of natural ecosystems. Bees not only produce sweet honey, but also bring other advantages, such as pollinating fruit trees and garden produce, and improving the quality of life. However, caution is necessary in urban areas so that bees do not disturb the residents living in the vicinity. Apiaries must thus be placed so as to prevent bees from bumping into passers-by. To this end, owners often set them up on their roofs or terraces, although in such cases bees must be protected from sun and wind.

A HIVE OF ACTIVITY – BEES IN THE LANDSCAPE

Animal pollination plays a vital role as a regulating ecosystem service in nature. The vast majority of flowering plant species only produce seeds if pollinators move pollen from the anthers to the stigmas of their flowers. Key biological events such as insect emergence and date of onset of flowering need to occur in synchrony for successful pollination interactions.

For crop pollination to be effective, timing is everything! Not only does the crop have to be in bloom but it must be accessible to its pollinators. Crops such as mangoes in tropical regions, or almonds or cherries in temperate regions, have periods of mass blooming over relatively short time spans, requiring a tremendous peak in pollinators. Alternate resources are sometimes needed to fully support pollination services during crop flowering. This could entail shipping pollinators into the crop area or farmers resorting to hand-pollination using paintbrushes with pollen on every flower.

The healthy functioning of ecosystem services ensures the sustainability of agriculture. Bees and forest beekeeping also help sustain forest ecosystems by providing pollination that leads to improved regeneration of trees and conservation of the forest's biodiversity. Bees and other pollinators are thus vital to the environment and biodiversity conservation, as well as many other dimensions of global sustainable development.

THREATS TO POLLINATORS

Bees and other pollinators are under threat. Present species extinction rates are 100 to 1 000 times higher than normal due to human impacts. Insects will likely make up the bulk of future biodiversity loss with 40 percent of invertebrate pollinator species – particularly bees and butterflies – facing extinction. Though to a lesser degree, vertebrate pollinators (16.5 percent) are also threatened with extinction globally.

Changes in land use and landscape structure, intensive agricultural practices, monocultures and use of pesticides have led to large-scale losses, fragmentation and degradation of their habitats. Pests and diseases resulting from reduced resistance of bee colonies and from globalization, which facilitates the transmission of pests and diseases over long distances, pose a special threat. Furthermore, climate change also has a negative impact. Higher temperatures, droughts, floods, other extreme climate events and changes of flowering time hinder pollination largely by desynchronizing the demand (flowers in bloom) with the supply of service providers (abundant and diverse populations of pollinators).

PROMOTING POLLINATOR CONSERVATION AND MANAGEMENT

FAO carries out various activities to encourage pollinator-friendly practices in agricultural management. It provides technical assistance to countries on issues ranging from queen breeding to artificial insemination to sustainable solutions for honey production and export marketing.

The Global Action on Pollination Services for Sustainable Agriculture provides valuable information, helping farmers, farm advisors and land managers better understand the pollination needs of specific crops. It will include a global monitoring system that captures the diversity of domesticated honeybees, including data about products and services as well as the main threats and challenges that honeybees face.

The International Pollinators Initiative 2.0, coordinated by FAO, promotes coordinated worldwide action to monitor pollinator decline, identify practices and build capacity in the management of pollination services for sustainable agriculture and improve food security, nutrition and livelihoods.

THE WAY FORWARD

To protect bees and pollinators from the threats to their abundance, diversity and health, efforts should be made to build a greater diversity of pollinator habitats in agricultural and urban settings. Policies that favour of pollinators that promote biological pest control and limit the use of pesticides should be implemented.

Farmers can help maintain pollinator abundance, diversity and health by using innovative practices that integrate local and scientific knowledge and experience and by diversifying farms to make food resources and shelter continuously available to pollinators. We need to increase collaboration among national and international organizations, academic and research bodies and networks to monitor, research and assess pollinators and pollination services.

We all have a chance to grow our appreciation for bees and other pollinators, especially on 20 May, or World Bee Day.

THE IMPORTANCE OF CELEBRATING WORLD BEE DAY

Observing World Bee Day on 20 May each year will draw attention to the essential role bees and other pollinators play in keeping people and the planet healthy. It provides an opportunity for governments, organizations, civil society and concerned citizens everywhere to promote actions that will protect and enhance pollinators and their habitats, improve their abundance and diversity, and support the sustainable development of beekeeping.

The date for this observance was chosen as it was the day Anton Janša, a pioneer of modern apiculture, was born. Janša came from a family of beekeepers in Slovenia, where beekeeping is an important agricultural activity with a long-standing tradition.

The proposal set forth by the Republic of Slovenia, with the support of Apimondia, the International Federation of Beekeepers' Associations and FAO, to celebrate World Bee Day on 20 May each year met with approval by the United Nations General Assembly in 2017.

World Bee Day intends to shine a light on the importance of pollinators to improve the conditions for their survival so that bees and other pollinators may thrive.

> *This is the beginning of a difficult process of the protection of bees and other pollinators. We must do more than just talk – we should undertake concrete activities to increase care for bees and promote the development of beekeeping – everywhere.*

Dejan Židan
Former Minister of Agriculture, Forestry and Food of the Republic of Slovenia, and the head of the World Bee Day project

TIME

20 May 1734
Breznica, Slovenia
Birth of Anton Janša, pioneer of modern apiculture

1766
Anton enrols in Europe's first beekeeping school

1771
Publishes first important book on beekeeping

1773
Death of Anton Janša

POLLINATION AND ZERO HUNGER

What do bees have to do with achieving Zero Hunger, one of the 17 Sustainable Development Goals? Quite a lot, actually. Close to three-quarters of the world's crop species depend, at least in part, on bees and other pollinators, conforming to the major characteristics of the 2030 Agenda for Sustainable Development, nourishing people and nurturing the planet. Pollinators play an essential role in helping to feed a rising world population in a sustainable way [SDG 2] and help maintain biodiversity and a vibrant ecosystem [SDG 15]. They contribute to building resilient livelihoods and creating new jobs, for poor smallholder farmers in particular, satisfying the growing demand for healthy, nutritious food as well as non-food products [SDGs 1 and 9].

The worrying decline in the number of pollinators, largely brought about by intensive agricultural practices, changes in land use, use of pesticides and by more extreme weather events, is related to pest and disease outbreaks, and higher levels of malnutrition and non-communicable diseases, provoking health issues for populations around the world [SDGs 3 and 13].

Already the highest agricultural contributor to yields worldwide, pollination, with improved management, has the potential to increase yield by a quarter [SDG 8]. No wonder there is so much buzz about bees!

TIMELINE

2016

At the FAO Regional Conference for Europe, the Republic of Slovenia proposes World Bee Day

2017

Proposal for World Bee Day is submitted for consideration at the 40th Session of FAO Conference

2017

UN General Assembly unanimously proclaimes 20 May as World Bee Day

20 May 2018

Žirovnica, Slovenia

First Observance of World Bee Day

For centuries bees, busy as they are known to be, have benefited people, plants and the planet. But did you know that bees are not the only ones that sustain life on earth? By carrying pollen from one flower to another, bees, butterflies, birds, bats and other pollinators facilitate and improve food production, thus contributing to food security and nutrition. Pollination also has a positive impact on the environment in general, helping to maintain biodiversity and the vibrant ecosystems upon which agriculture depends.

To encourage pollinator-friendly practices in agricultural management and stop the decline of pollinator populations, FAO carries out various activities. Every year on 20 May, World Bee Day offers an opportunity for all of us to pay tribute to pollinators.

Learn more:

FAO's work on pollinators: www.fao.org/pollination/en

Government of Slovenia: www.vlada.si/en

World Bee Day: www.worldbeeday.org/en

#worldbeeday

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