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18.



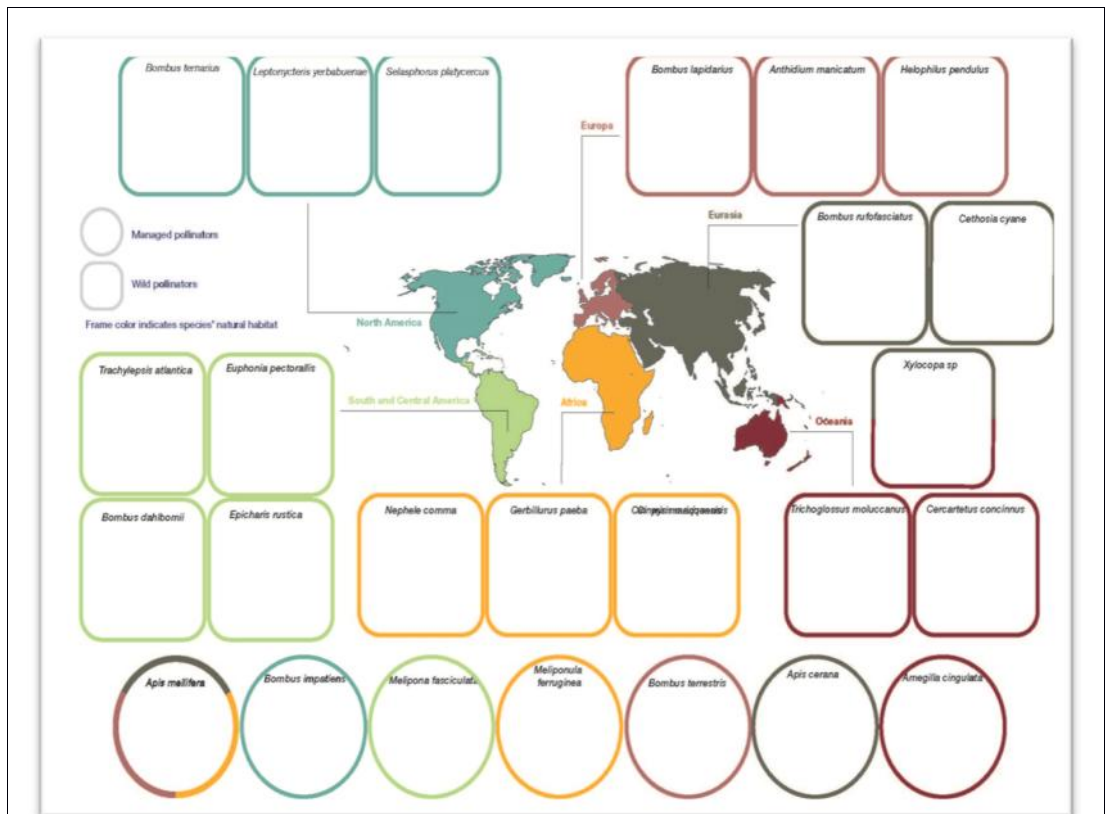


B

1

2

{2.3.1, 2.3.4},



.1:

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.1	
Managed pollinators	
Wild pollinators	
Frame color indicates species' natural habitat	
North America	

South and Central America		
Europa		
Africa		
Eurasia		
Oceania		

**A.**

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{4.2, 4.6, 5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.1.5, 5.2.1, 5.2.5, 5.3.1, 5.5, 5-1, 5-2}. 5-5

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**87,5** ( **308 000** )

,

**78** **94** ( , )

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,

{1.2.1, 1.6, 4.0, 4.4}.

<sup>34</sup>

**33-35** ( , ) .

91 107 <sup>35</sup> ( , )

12 90 ,

7

8 28

40-90 ,

1 40 ( **.2**).

,60 ( , ),35 , 5

( , , , , , ) ,

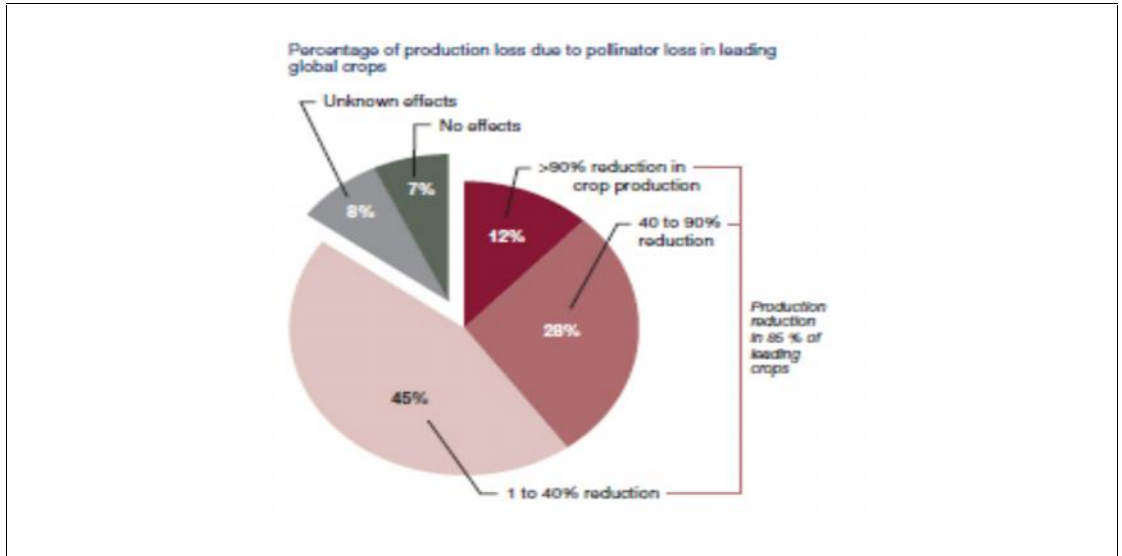
( , , , , , ) ( , )

{1.1, 1.2.1, 3.7.2}.

<sup>34</sup>

<sup>35</sup> Klein et al. (2007) «Importance of pollinators in changing landscapes for world crops» Proc. R. Soc. B 274: 303-313.





.2:

36

.2	
Percentage of production loss due to pollinator loss in leading global crops	
Unknown effects	
No effects	
>90% reduction in crop production	90%
40 to 90% reduction	40-90%
1 to 40% reduction	1-40%
Production reduction in 85% of leading crops	85%

5-8

(...),  
 A,  
 .3A) ( , , )  
 {3.7.2, 5.2.2}.  
 {1.1, 2.6.4, 3.7, 3.8. 5.4.1.2}.

5-8  
 235-577

2015

( , , ) ( .3B) {3.7.2, 4.7.3}.

5-15

<sup>36</sup> Klein et al. (2007) «Importance of pollinators in changing landscapes for world crops» Proc. R. Soc. B 274: 303-313.

(107 , ),

160-191

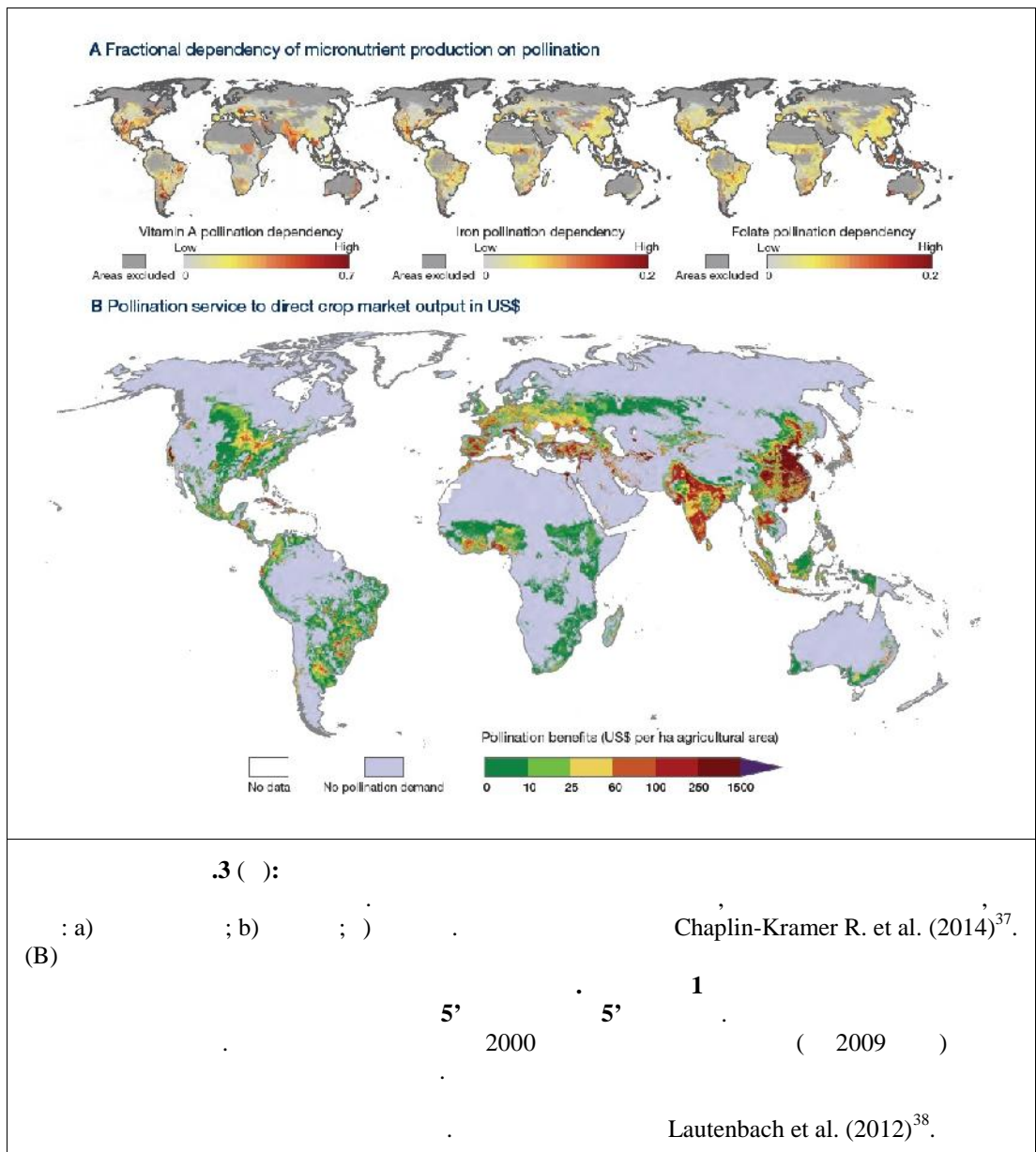
207-497

( ) {4.7}.

{4.2, 4.3, 4.5, 4.7}.

{4.1,

4.6}.



<sup>37</sup> Chaplin-Kramer et al. (2014) «Global malnutrition overlaps with pollinator-dependent micronutrient production». Proc. R. Soc. B 281: 2014.1799.

<sup>38</sup> Lautenbach et al. (2012) «Spatial and temporal trends of global pollination benefit». PLoS ONE 7: e35954.

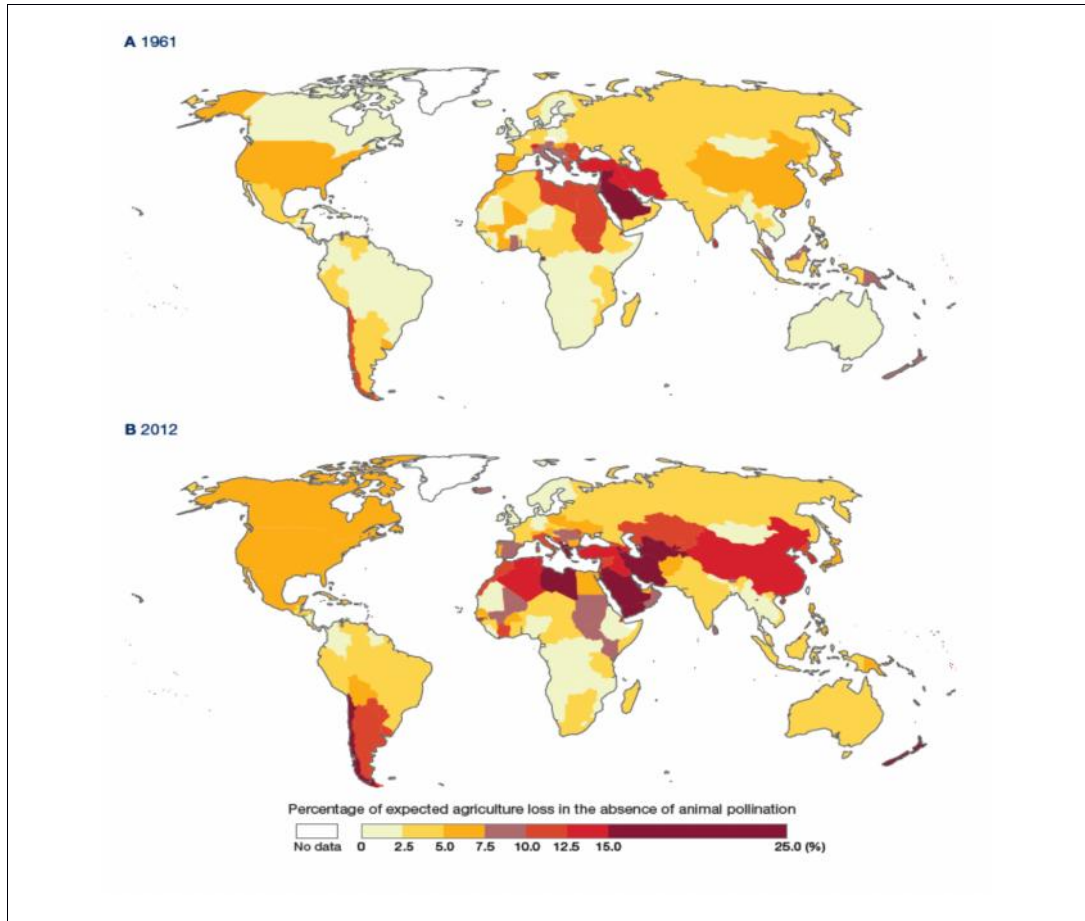




**B.**

300

{3.7.2, 3.7.3, 3.7.4, 3.8.3}.



.4:	
1961	2012
Percentage of expected agriculture loss in the absence of animal pollination	
No data	

<sup>39</sup> Aizen et al. (2009) «How much does agriculture depend on pollinators? Lessons from long-term trends in crop production» *Annals of Botany* 103: 15791–588.

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( , ) {3.7.2, 3.8.2, 3.8.3} .

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( ) ( .5) .

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( 10-15 , )

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{2.4.2.3, 2.4.2.4, 3.3.2, 3.3.3, 3.3.4, 3.3.5} .



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2

{3.7.2, 3.8.2, 3.8.3}.

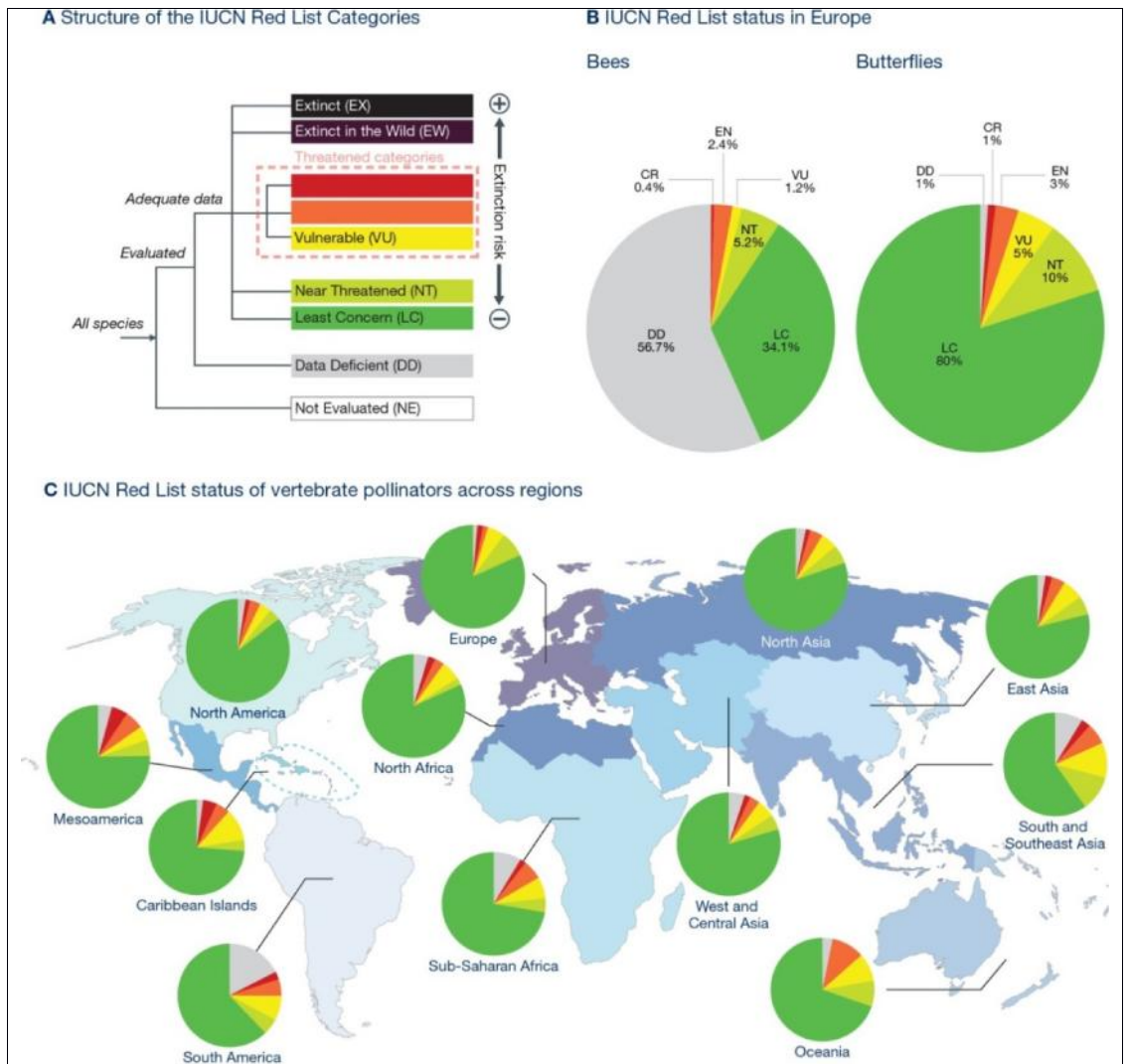


Figure 6: IUCN Red List status of vertebrate pollinators across regions. The figure consists of three panels: A, B, and C. Panel A shows the structure of the IUCN Red List categories, ranging from Extinct (EX) to Not Evaluated (NE). Panel B shows the IUCN Red List status of Bees and Butterflies in Europe. Panel C shows the IUCN Red List status of vertebrate pollinators across 11 regions: North America, Mesoamerica, Caribbean Islands, South America, Europe, North Africa, Sub-Saharan Africa, North Asia, West and Central Asia, East Asia, and South and Southeast Asia, and Oceania.

Structure of the IUCN Red List Categories	
Adequate data	
Evaluated	
All species	
Extinct (EX)	(EX)
Extinct in the wild (EW)	(EW)
Threatened categories	
Critically endangered (CR)	(CR)





( , - , 42  
 ), 12  
 . 57  
 2007 , 42, 10  
 , 10 , 1 , 3 ,  
 {3.2.2,  
 3.2.3}.  
**C.** ,  
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 ( , ) .  
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 ) , ( , ) ,  
 ( , ) .  
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 43 ( ,  
 ) {2.7, 4.5, 6.2.1}.  
 ,  
 ) ( , ( ) .  
 , , - ( ,  
 ) {2.2.1.1, 2.2.1.2, 2.2.2, 2.3.1.2, 2.3.1.3, 3.2.}.  
 : , ,  
 ( .1). i)  
 ; ii)  
 , , ,  
 ( , ) ;  
 iii)  
 , ,  
 .  
 ( , ) .

<sup>42</sup> Klein et al. (2007). «Importance of pollinators in changing landscapes for world crops». *Proceedings of the Royal Society B* 274:303-313.

<sup>43</sup>

( , ). ( .1),  
( , .1) ,  
{2.2.1, 2.2.2, 2.3.1, 2.3.2.3, 3.2.3, 3.6.3, 5.2.8, 6.9}.

( , ( ) ,  
( , ).  
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( , ).  
{6.4.1.1.1, 6.4.1.1.4, 6.7.1, 6.7.2}.

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) ( , , )  
( ) .  
( , , )  
{2.2.2, 2.2.3, 3.2.3}.

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( ) ( , , ) ,  
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( , , ) , ( , ,  
) ,  
{2.2.1.2, 6.4.1.1.10, 6.4.1.5, 6.4.1.3, 6.4.3.1.1, 6.4.3.1.2, 6.4.3.2.2, 6.4.5.1.6}.

1) , ( , ) . :



( ; 10,3 ± 1,3 / , ( ; 13,9 ± 1,8 / , 6,6-23 / )  
 ( ; 6,7-16 / ) , ( , 2015 )  
 , ( , 2014 ) ,  
 ( , 6,1 / ) ( , 1,9 / );  
 (16 ( ), 2013 ;  
 ( , 2014 )<sup>44</sup> .

.7	
Reported effects of neonicotinoid insecticides on individual adult honey bees	
Concentration consumed orally by individual honey bees or exposure at the sub-organism level (µg/Kg or ppb)	( / )
Molecular	
Physiological	
Organism	
Effect	
No effect	
Pollen range (all studies)	( )
1,000,000	1 000 000
100,000	100 000
10,000	10 000
1,000	1000
100	100
10	10
1	1
0.1	0,1
0.01	0,01
Molecular	
Cellular	
Morphology	
Immune responses and physiology	
Memory	
Behaviour	
Lifespan	
13.9 (± 1.8) µg/Kg Pollen	13,9 (± 1,8) /
10.3 (± 1.3) µg/Kg Nectar	10,3 (± 1,3) /
6.1 µg/Kg Pollen	6,1 /
1.9 µg/Kg Nectar	1,9 /
Average residue values (Rundlöf et al (2015))	( )
Average maximum residue values (Godfray et al. (2014))	( . (2014 ) )

<sup>44</sup> EFSA (2013) «Guidance on the risk assessment of plant protection products on bees (*Apis mellifera*, *Bombus* spp. and solitary bees)». *EFSA Journal* 11: 3295; USEPA (2014) «Guidance for Assessing Pesticide Risks to Bees». *United States Environmental Protection Agency*.

( ),

( )

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( )<sup>45</sup>.

( ).

( ), (2.3.1.4)

( , ) {2.3.1.1, 2.3.1.3, 6.4.2.4.1}.

( ) {2.3.1.3, 6.4.2.1.2, 6.4.2.1.3, 6.4.2.1.4}.

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( ).

15 {6.4.2.1, 6.4.2.2.5, 6.4.2.2.6, 6.4.2.4.2}.

( , ),

( ).

( , ) {2.2.2.1.4, 2.2.2.1.8, 2.2.2.1.9, 2.2.2.3, 2.3.1.2, 2.3.1.4.2}.

{2.3, 6.4.2.1.4, 6.4.5.1.3}.

{5.3.3, 5.3.4, 5.4.2, 6.4.1.1.8}.

{2.3.1.4.2}.

( ) ( )

( ) , ,

<sup>45</sup> Rundlöf et al., 2015. Seed coating with a neonicotinoid insecticide negatively affects wild bees. Nature 521:77-80 doi:10.1038/nature14420.

( , ) .

( ) , {2.3.2.3.1}.

( ) , ( )

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, {2.3.2.3.1}.

*Thuringiensis* (Bt) ( ) ( , *Bacillus* .

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) {2.3.2.2} .

{2.3.2.3.2}.

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( ) ( )

( ) , {6.4.2.6.1}.

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/ - ( , ) {3.3.2}.

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{3.3.3, 3.4.3, 6.4.4.1.1.2},

( ) {6.4.4.1.1.3}.

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( , , ) {3.3.2, 6.4.4.5}.

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{2.4, 3.3.3, 3.4.3}. (*Apis mellifera*)

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( - ( ) , ) {6.4.4.1.1.2.3.1}.

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( , ) ,

{2.4, 3.2.3, 3.3.3, 3.4.3, 6.4.4.1.1.2.3.5}.

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( ) {2.7}.

, , ) {2.4}.  
 , , ( )  
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 ( -) ( , , ).  
*Bombus dahlbomii*  
*B. Terrestris* ( )  
 ) {3.2.3, 3.3.3, 3.4.32, 3.4.3}.  
 ( ,  
 ), ) {3.2.3, 3.3.2, 3.4.2, 3.4.3}.  
 , ( ,  
 ) {6.4.4.2}.  
 ( ) {2.5, 3.5.3}.  
 , {2.5.1,  
 2.5.2, 2.5.5, 3.5.3}.  
 , ( , , ) {6.4.3.1.4}.  
 ( , , ) {2.5.4}.  
 ( , , , ) {2.5.6, 3.5.4}.  
 , ( , , , ) {6.4.3.1.4}.  
 ( , )  
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 ( ) {2.6.2.2, 3.2.2}.  
 ( ).  
 , 2050 : i)  
 ) {2.6.2.3, 3.2.2}; ii)  
 ( , , ) {2.6.2.1}.  
 ,  
 46 ,  
 ( , ) {2.6.2.2}. , ( , ,



( , ) {2.6.2.3}.

{6.4.1.1.12, 6.4.4.1.5, 6.5.10.2, 6.8.1}.

( , ) {2.7}.

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( , ) {2.8, 3.7.2, 3.7.3, 3.8}.

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( , ) {2.2.1, 2.2.2, 2.3.1, 2.3.2.3, 3.2.2, 3.3.3, 3.6, 3.8.2, 3.8.3, 5.4.1, 5.4.2, 6.2.1}.

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		• *	2.2.2.1.8, 2.2.3, 6.4.1.1.3
		• ,	2.2.2.2, 2.2.3, 6.4.1.1.7
		•	6.4.1.3, 5.3.4
		•	5.4.2.7, 2.3.1.1, 6.4.1.5
		• , ( )	2.3.1.2, 2.3.1.3, 6.4.2.1.1, 6.4.2.2.5
		• , , ,	2.3.1.2, 2.3.1.3, 6.4.2.1.3, 6.4.2.1.2
		• ;	2.4, 6.4.4.1.1.2.2, 6.4.4.1.1.2.3, 6.4.4.2
		• ( ) ,	6.4.2.1.4
•	2.4.2, 4.4.1.1, 5.3.5, 6.4.4.1.3		
• *	2.4.2		
•	6.4.1.3, 6.4.4.3		
• *	2.2.2.2.1, 6.4.5.1.4, 6.4.5.1.6		
•	2.2.2.3, 6.4.5.1.4, 6.4.5.1.6, 6.4.5.4		
	-	•	2.2.1.1, 2.2.1.2, 2.2.2.1.1, 2.2.2.1.6, 5.2.8, 5.4.4.1, 6.4.1.1.8
		•	2.2.2.1.3, 6.4.1.1.5
		•	2.7.1, 6.4.1.1.12
		• ; ( )	5.2.7, 5.4.5.2, 6.4.1.4
		• ( )	2.2.2.1.1, 2.3.1.1, 6.4.2.1.4, 6.4.2.2.8, 6.4.2.4.2
		•	5.2.7, 6.4.1.1.10
		•	6.4.3.3
		•	6.4.4.1.3, 6.4.4.3

		•	2.2.2.1.1, 2.2.3, 5.2.7, 5.4.7.3, 6.4.6.3.3
		•	2.2.2.1.1, 2.2.2.1.6, 5.2.8, 5.4.4.1, 6.4.1.1.4, 6.4.1.1.8
		• «	5.4.5.3, 5.4.5.4, 5.4.7.2, 5.4.7.3
		• ( )	6.4.3.1.1, 6.4.5.1.1, 6.4.5.1.2
		•	5.2.6, 5.2.7, 5.3.2, 5.4.5.1, 5.4.5.3
		•	2.2.1.2, 6.4.3.1.2
		• «	5.1.3, 5.2.6, 5.2.7, 5.2.9, 6.4.6.2.1
		•	2.2.1, 2.2.2, 2.2.3, 2.2.1.2, 6.4.1.5, 6.4.4.5
		•	5.4.7.3, 6.4.1.5, 6.4.6.3.3
		•	5.2.7, 5.4.7.1, 5.4.7.3, 6.4.4.5, 6.4.6.3.3
•	5.2.3, 5.3.2, 5.3.3, 5.3.4, 5.4.7.1, 6.4.4.5		
		• ( )	5.2.4, 5.4.7.3, 6.4.1.1.10, 6.4.4.5, 6.4.6.3.4
		•	6.4.3.5
		•	5.2.4, 6.4.6.3.1
		•	6.4.5.1.3
		•	5.4.7.4, 6.4.1.1.10, 6.4.6.2.2

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5-4 5-5). (5.4.1, 5.4.2.2, 5.4.7.3,

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, , {6.4.1.1.10, 6.4.6.3.4}.

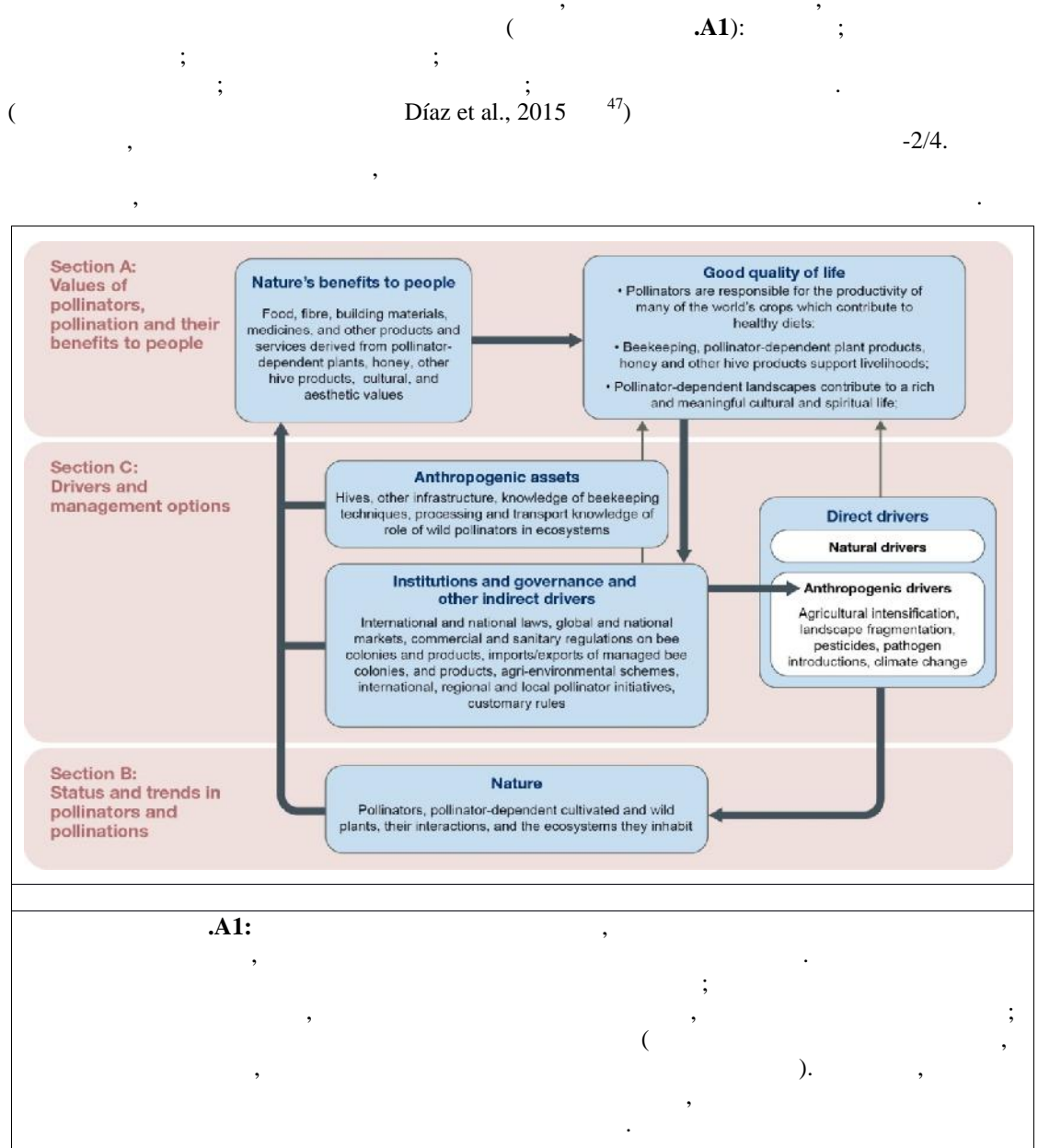
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5.4.7.4} {5.4.2.8,



.A1	
Section A: Values of pollinators, pollination and their benefits to people	A:
Nature's benefits to people	
Food, fibre, building materials, medicines, and other products and services derived from pollinator-dependent plants, honey, other hive products, cultural, and aesthetic values	
Good quality of life	

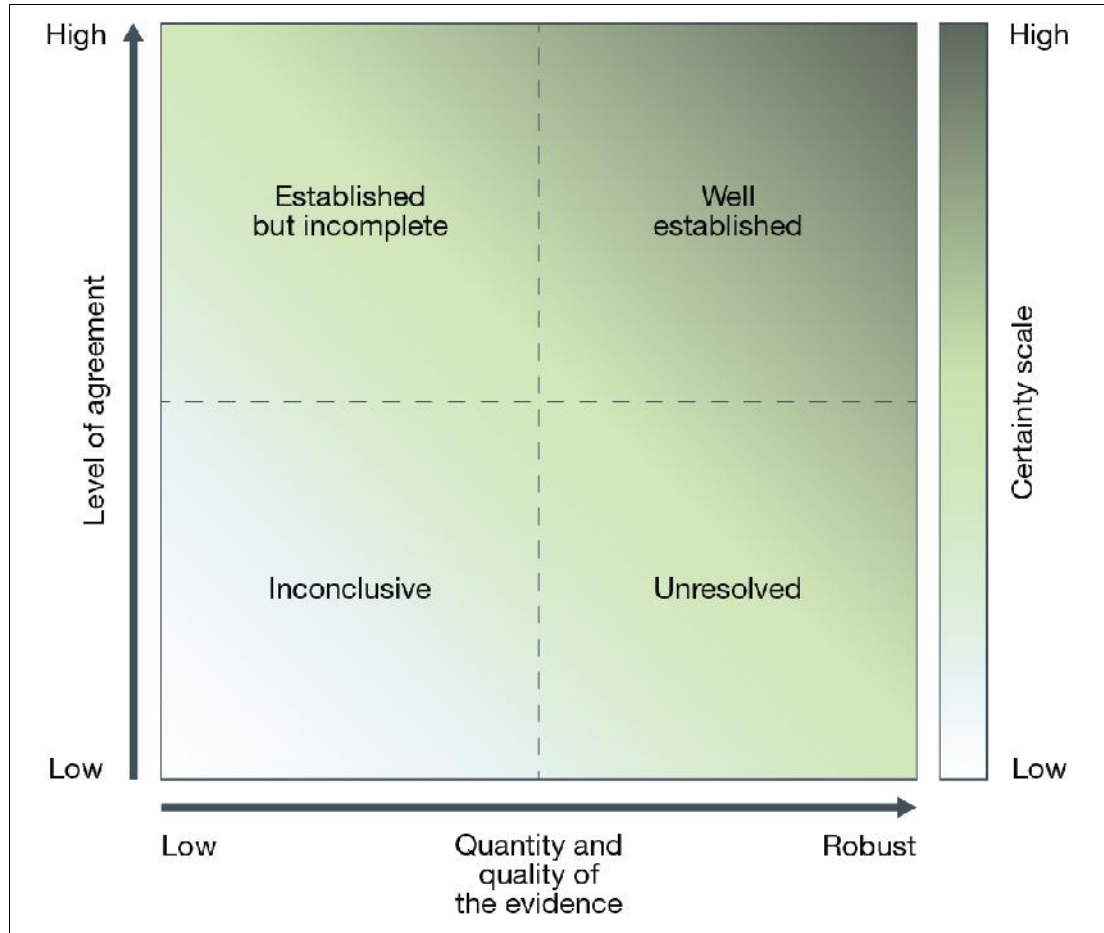
<sup>47</sup> Díaz et al. (2015) «The IPBES Conceptual Framework - connecting nature and people» *Current Opinion in Environmental Sustainability* 14: 1–16.





(.A2).

(IPBES/4/INF/9).



.A2:

(2000 )<sup>48</sup>.

.A2:	
Level of agreement	
High	
Low	
Quantity and quality of the evidence	
Low	
Robust	
Certainty scale	
High	
Low	
Established but incomplete	
Well established	
Inconclusive	
Unresolved	

<sup>48</sup> Moss R.H. and Schneider S.H. (2000) «Uncertainties in the IPCC TAR: Recommendations to lead authors for more consistent assessment and reporting», *Guidance Papers on the Cross Cutting Issues of the Third Assessment Report of the IPCC* [eds. R. Pachauri, T. Taniguchi and K. Tanaka], World Meteorological Organization, Geneva, pp. 33-51.



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