



PANDUAN DAN PROFIL PENGHARGAAN SARWONO AWARD DAN SARWONO PRAWIHARJO MEMORIAL LECTURE

2026



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PANDUAN DAN PROFIL PENGHARGAAN **SARWONO AWARD** DAN **SARWONO PRAWIHARJO MEMORIAL LECTURE**

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**SAMBUTAN
KEPALA BADAN RISET DAN INOVASI NASIONAL
PADA ACARA**

***SARWONO AWARD DAN
SARWONOPRAWIROHARDJO MEMORIAL LECTURE***

SENIN, 24 AGUSTUS 2026

**AUDITORIUM SUMITRO DJOHADIKUSUMO, GEDUNG BJ
HABIBIE LT 3, BADAN RISET DAN INOVASI NASIONAL, JL.
M.H. THAMRIN NO.8, JAKARTA PUSAT**

PUKUL 14.00-16.00 WIB

Assalamu'alaikum warahmatullahi wabarakatuh,
Selamat pagi dan salam sejahtera bagi kita semua.

Yang saya hormati, Ketua Komisi X dan Anggota DPR RI; Para Menteri Kabinet Merah Putih; Pimpinan Lembaga dan Kepala Daerah; Dewan Pengarah BRIN; Direktur Utama Lembaga Pengelola Dana Pendidikan; Keluarga Besar Prof. Dr. Sarwono Prawirohardjo; Para Rektor atau yang mewakili; Para Pejabat Tinggi Madya di lingkungan BRIN; Dan Bapak/Ibu tamu undangan sekalian.

Puji syukur kita panjatkan ke hadirat Tuhan Yang Maha Esa, karena atas rahmat-Nya kita dapat hadir pada acara Sarwono Award dan Sarwono Prawirohardjo Memorial Lecture Tahun 2026.

Hadirin yang saya hormati, pemerintah Indonesia, melalui Badan Riset dan Inovasi Nasional (BRIN) dan

Lembaga Pengelola Dana Pendidikan (LPDP), terus memperkuat kerangka Manajemen Talenta Nasional guna memastikan kesinambungan ekosistem riset yang tangguh. Komitmen ini diwujudkan melalui pemberian apresiasi tertinggi kepada para talenta unggul yang telah menunjukkan dedikasi luar biasa dan lifetime achievement yang berdampak luas bagi kemajuan ilmu pengetahuan dan inovasi tanah air. Penyelenggaraan Sarwono Award dan Sarwono Prawirohardjo Memorial Lecture merupakan wujud nyata komitmen tersebut. Ajang ini bukan sekadar pemberian penghargaan, tetapi juga pengakuan bahwa ilmu pengetahuan merupakan fondasi penting bagi daya saing bangsa.

Hadirin yang berbahagia, Sarwono Award dan Sarwono Prawirohardjo Memorial Lecture telah dilakukan oleh Lembaga Ilmu Pengetahuan Indonesia (LIPI) sebelumnya sejak tahun 2001, kemudian dilanjutkan oleh BRIN sejak 2021. Sarwono Award bukan sekadar seremonial penghargaan. Ini adalah manifestasi dari penghormatan kita terhadap keteladanan Prof. Sarwono Prawirohardjo. Beliau bukan sekadar perintis ilmu pengetahuan, melainkan peletak dasar budaya riset yang menjunjung tinggi integritas, kemandirian berpikir, dan pengabdian tulus bagi tanah air.

Penghargaan ini menegaskan bahwa riset yang berkualitas tidak lahir dari keinginan untuk sekadar mengejar capaian instan, melainkan tumbuh dari ketekunan, kesetiaan pada kebenaran ilmiah, dan ketajaman visi dalam melihat persoalan bangsa. Sarwono Award hadir sebagai simbol pengingat bahwa keunggulan riset dibangun melalui napas panjang, sebuah perjalanan intelektual yang membutuhkan dedikasi, kolaborasi lintas disiplin, dan keberanian untuk menghadirkan solusi yang berdampak bagi masyarakat. Penghargaan ini merupakan pengakuan atas perjalanan panjang seorang periset dalam mengembangkan ilmu pengetahuan, menghasilkan karya-karya bermakna, membangun ekosistem riset, serta menunjukkan dedikasi yang konsisten sepanjang kariernya. Sarwono Award menjadi simbol bahwa keunggulan riset

dibangun melalui proses panjang, ketekunan, integritas, dan komitmen yang terus dijaga dari waktu ke waktu.

Melalui apresiasi ini, kita tidak hanya merayakan karya individu, tetapi sedang merawat ruh keilmuan yang beliau wariskan. Kita berharap, jejak-jejak dedikasi seperti yang ditunjukkan oleh penerima Sarwono Award dan pemberi Sarwono Prawirohardjo Memorial Lecture, menjadi penunjuk arah bagi generasi berikutnya untuk terus berkarya, menjaga integritas, dan memberikan kontribusi terbaik bagi kemajuan bangsa Indonesia dalam mewujudkan Indonesia Emas 2045.

Hadirin sekalian, pada kesempatan yang berbahagia ini, Pemerintah Indonesia melalui BRIN dengan bangga menganugerahkan Sarwono Award Tahun 2026 kepada Prof. Drs. Jatna Supriatna, Ph.D. dari Universitas Indonesia. Prof. Jatna adalah seorang pakar biologi konservasi dan visioner lingkungan hidup yang telah mendedikasikan hidupnya bagi keberlanjutan bumi. Beliau yang merupakan lulusan University of New Mexico dan peraih pelatihan manajemen di MIT, merupakan sosok sentral di Universitas Indonesia yang telah melahirkan banyak inisiatif strategis seperti Climate Change Research Center (RCCC), Institute for Sustainable Earth and Resource (ISER), serta SDG Hub di FMIPA UI. Kiprah internasional beliau diakui luas, mulai dari peran di United Nations Sustainable Development Solutions Network (UN SDSN) hingga International Union for Conservation of Nature (IUCN).

Dengan lebih dari 240 artikel ilmiah dan 30 buku yang telah dipublikasikan, dedikasi beliau tidak hanya diakui melalui berbagai penghargaan bergengsi seperti Habibie Award dan Lifetime Achievement dari berbagai institusi, tetapi juga melalui pengabdian nama beliau pada spesies baru seperti *Tarsius supriatnai* dan *Draco supriatnai*. Dijuluki sebagai “The Noah of Modern History” dan “Conservation Warrior”, Prof. Jatna merupakan teladan nyata bagaimana ilmu pengetahuan mampu menjadi fondasi bagi kebijakan konservasi yang berdampak luas bagi Indonesia dan dunia.

Kami juga menyambut Prof. Dr. Gono Semiadi, Peneliti Pusat Riset Biosistematika dan Evolusi BRIN, sebagai penyampai atau pemberi Sarwono Prawirohardjo Memorial Lecture 2026. Prof. Gono adalah pakar biodiversitas dan konservasi satwa liar dengan rekam jejak riset selama 40 tahun. Lulusan Texas A&M University dan Massey University ini memiliki keahlian lintas disiplin, mulai dari pengelolaan mamalia dan genetika satwa hingga forensik biodiversitas. Kiprah internasional beliau diakui melalui peran strategis di Intergovernmental Platform on Biodiversity and Ecosystem Services (UN IPBES) dan Convention on Biological Diversity (CDB) di bawah PBB, serta kontribusi aktif dalam penyusunan kebijakan nasional, termasuk Indonesian Biodiversity Strategy and Action Plan (IBSAP), dan Strategi dan Rencana Aksi Konservasi (SRAK) spesies. Sebagai sosok yang berhasil menjembatani sains dan kebijakan, beliau telah menghasilkan karya ilmiah yang menjadi rujukan global, menegaskan pentingnya ketekunan ilmiah dalam menjaga masa depan biodiversitas Indonesia.

Kami menyampaikan penghargaan yang setinggi-tingginya kepada Prof. Jatna Supriatna dan Prof. Gono Semiadi atas dedikasi, integritas, serta kontribusi luar biasa bagi kemajuan ilmu pengetahuan, teknologi, dan inovasi di Indonesia. Semoga capaian beliau berdua menjadi inspirasi bagi para peneliti, perekayasa, dosen, mahasiswa, inovator, dan generasi muda Indonesia untuk terus berkarya, berinovasi, serta menghadirkan solusi bagi berbagai tantangan bangsa.

Bapak/ibu yang saya hormati, marilah kita terus memperkuat sinergi lintas sektor, antara pemerintah, perguruan tinggi, lembaga riset, industri, dunia usaha, dan masyarakat. Sinergi ini adalah fondasi bagi bangsa kita untuk tidak hanya mandiri dalam ilmu pengetahuan dan teknologi, tetapi juga menjadi pusat gravitasi dalam ekosistem inovasi global. Semoga Sarwono Award dan Sarwono Prawirohardjo Memorial Lecture terus menjadi katalis bagi lahirnya talenta-talenta unggul yang akan membawa Indonesia menuju negara maju, berdaulat,

dan berdaya saing. Riset Berkualitas, Inovasi Berdampak,
Mewujudkan Indonesia Emas 2045.

Terima kasih.

Wassalamu'alaikum warahmatullahi wabarakatuh,

Kepala Badan Riset dan Inovasi Nasional
Prof. Dr. Arif Satria, S.P., M.Si.





PENDAHULUAN

Ilmuwan adalah orang yang ahli atau memiliki banyak pengetahuan mengenai suatu ilmu. Dalam arti yang lain, ilmuwan adalah orang yang berkecimpung dalam ilmu pengetahuan. Para ilmuwan ini dalam pekerjaan menghasilkan suatu karya yang dapat digunakan dan diterapkan kepada masyarakat luas. Sumbangsih para ilmuwan ini dalam memberikan kontribusi kepada negara dan bangsa layak untuk diberikan suatu penghargaan.

Sarwono Award merupakan suatu kegiatan ilmiah dalam memberikan apresiasi yang bersifat *"a lifetime achievement"* kepada individu yang memiliki prestasi dan kontribusi luar biasa dalam bidang ilmu pengetahuan dan teknologi serta memiliki dampak penelitian yang dimanfaatkan oleh masyarakat, baik melalui Kekayaan Intelektual (KI) maupun bentuk penelitian lainnya melalui kolaborasi dengan mitra.

Sarwono Prawirohardjo Memorial Lecture merupakan kegiatan keilmuan dalam bentuk orasi ilmiah yang disampaikan oleh individu yang berjasa dalam penemuan, pengembangan, dan penyebarluasan di bidang ilmu pengetahuan dan teknologi, serta memiliki kontribusi bagi masyarakat dan bangsa Indonesia.

Penggunaan nama "Sarwono" dimaksudkan untuk mengenang jasa pengabdian Prof. Dr. Sarwono Prawirohardjo (Kepala LIPI pertama) dalam membangun ilmu pengetahuan Indonesia. Sejak 2001, orasi ilmiah Sarwono Prawirohardjo Memorial Lecture telah dilaksanakan setiap tahun, dan sejak 2002 diberikan penghargaan Sarwono Memorial Award merupakan penghargaan kepada perorangan yang telah menunjukkan prestasi luar biasa dalam ilmu pengetahuan, kebudayaan, dan kemanusiaan.

Badan Riset dan Inovasi Nasional (BRIN) bekerjasama dengan Lembaga Pengelola Dana Pendidikan (LPDP) merasa perlu untuk memberikan penghargaan tertinggi

secara berkelanjutan kepada Perorangan yang berasal dari internal maupun dari eksternal BRIN. Sarwono Memorial Award dan Sarwono Prawirohardjo Memorial Lecture yang sebelumnya dilaksanakan oleh LIPI sebagai rangkaian acara peringatan hari ulang tahun LIPI, yang selanjutnya dilaksanakan oleh BRIN sebagai lembaga keilmuan terbesar sudah seharusnya menyelenggarakan kegiatan keilmuan yang cerdas dan bergengsi. Perwujudannya dengan memberi anugerah dan juga tempat terhormat untuk orasi ilmiah bagi para sosok ilmuwan yang telah mempunyai reputasi nasional dan internasional, serta kontribusinya yang besar untuk pengembangan ilmu pengetahuan.

Sarwono Award dan Sarwono Prawirohardjo Memorial Lecture 2026 dilaksanakan pada 24 Agustus 2026, bertempat di Auditorium Sumitro Djojohadikusumo, Gedung B.J. Habibie Lt. 3 Jln. M.H. Thamrin No. 8 Jakarta Pusat.

Acara Sarwono Prawirohardjo Memorial Lecture adalah orasi ilmiah dari seorang ilmuwan, pakar, atau praktisi yang telah memberikan sumbangsih nyata dan bermanfaat bagi ilmu pengetahuan dan kemanusiaan. Berdasarkan hal tersebut, Kepala LIPI melalui Surat Keputusan Nomor 2257/ A/ 2001 tanggal 16 Agustus 2001 telah menetapkan bahwa salah satu kegiatan yang merupakan puncak acara dari rangkaian peringatan HUT LIPI setiap tahunnya adalah kegiatan Sarwono Prawirohardjo Memorial Lecture (SML). Sejak 2001, orasi ilmiah Sarwono Prawirohardjo Memorial Lecture dilaksanakan setiap tahun, dan pada 2026 akan menjadi orasi ilmiah yang ke-26. Adapun nama-nama pemberi orasi ilmiah sebelumnya adalah sebagai berikut:

1. Prof. Dr. Sangkot Marzuki, Ketua Lembaga Biologi Molekuler Eijkman, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture I (2001) dengan judul “Indonesia dan Revolusi Genom: Menyelusuri Sejarah Manusia Indonesia dan Masa Depan Bangsa”.
2. Prof. Dr. iur. Adnan Buyung Nasution, pendiri sekaligus anggota Dewan Penyantun LBH/ YLBHI dan anggota *Internasional Commission of Jurist*, menyampaikan orasi

- ilmiah pada Sarwono Prawirohardjo Memorial Lecture II (2002) dengan judul "Konstitusi, Demokrasi, dan Makna Kemerdekaan".
3. Prof. John A. Katili, D.Sc., Ph.D., Deputi Ketua LIPI Bidang Ilmu Pengetahuan Alam, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture III (2003) dengan judul "Dinamika Ilmu Pengetahuan dan Teknologi Rusia".
 4. Prof. Yohanes Surya, Ph.D., pendiri Surya University, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture IV (2004) dengan judul "Nanoteknologi Terkini Menyambut Masa Depan".
 5. Prof. Dr. Taufik Abdullah, Kepala LIPI periode 1999–2002, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture V (2005) dengan mengulas masalah kenangan mengenai penelusuran keutuhan negara dengan perlunya memedulkan cita-cita yang mendahului kelahiran negara dengan judul "Ketika Awal Dirayakan dan Keharusan Dipatrikan".
 6. Prof. Dr. Ir. Jan Sopaheluwakan, M.Sc., Deputi Bidang Ilmu Pengetahuan Kebumihian LIPI periode 2001–2006, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture VI (2006) dengan orasi berjudul "Bencana Alam: Refleksi Pembelajaran di Antara Musibah dan Berkah".
 7. Dr. Sri Mulyani Indrawati, Menteri Keuangan Republik Indonesia pada Kabinet Indonesia Bersatu, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture VII (2007) dengan judul "Kebijakan Keuangan Pemerintah RI dalam Pengembangan Riset dan Ilmu Pengetahuan".
 8. Dr. dr. Siti Fadillah Supari, Sp.JP(K), Menteri Kesehatan Republik Indonesia dalam Kabinet Indonesia Bersatu, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture VIII (2008) tentang kebijakan kesehatan Pemerintah RI, utamanya dalam menjalin kerja sama pengembangan riset ilmu pengetahuan dengan pihak luar negeri, dengan

judul orasi “LIPI dan Kebangkitan Nasional di Bidang Kesehatan”.

9. Prof. Dr. Dewi Fortuna Khaidir Anwar, M.A., Deputi Bidang Ilmu Pengetahuan Sosial dan Kemanusiaan LIPI periode 2001–2010, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture IX (2009) dengan orasi berjudul “Membebaskan Dunia dari Senjata Pemusnah Massal”.
10. Kuswata Kartawinata, Ph.D., peneliti senior LIPI terdahulu, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture X (2010) dengan orasi berjudul “Dua Abad Mengungkap Kekayaan Flora dan Ekosistem Indonesia”.
11. Prof. Dr. H. Ryaas Rasyid, M.A., anggota Dewan Pertimbangan Presiden, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XI (2011) dengan judul “Desentralisasi dan Demokratisasi: Evaluasi 10 Tahun Penyelenggaraan Otonomi Daerah”.
12. Prof. Dr. Soekarja Somadikarta, peneliti senior LIPI terdahulu, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XII (2012) dengan orasi berjudul “Pendidikan dan Perkembangan Ilmu di Indonesia”.
13. Ir. Karen Agustiawan, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XIII (2013) dengan judul “Membangun Portofolio Energi Nasional Pertamina: Overview dalam Pengembangan R&D dan Energi Baru Terbarukan”.
14. Prof. dr. Fasli Jalal, Ph.D, Sp.GK., menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XIV (2014) dengan judul “Bonus Demografi: Tantangan Penelitian untuk Pengabdian dalam Pembangunan Negeri dan Bangsa”.
15. Prof. Dr. Azyumardi Azra, M.A., C.B.E., menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XV (2015) dengan judul “Toleransi Beragama dalam Meningkatkan Persatuan dan Kesatuan Bangsa”.

16. Arif Havas Oegroseno, S.H., L.L.M., menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XVI (2016) dengan judul “Pengelolaan Kawasan Maritim dan Perbatasan Indonesia dalam Kerangka Kerja Sama Regional Asia Tenggara”.
17. Prof. Dr. Bambang S. Brodjonegoro, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XVII (2017) dengan judul “Arah Kebijakan Pembangunan Ilmu Pengetahuan dan Teknologi untuk Meningkatkan Daya Saing Bangsa”.
18. Ir. Mochamad Basoeki Hadimoeljono, Ph.D., menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XVIII (2018) dengan judul “Pembangunan Infrastruktur Berbasis Lingkungan”.
19. Prof. Dr. Irwandi Jaswir, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XIX (2019) dengan judul “Menjadi Periset Berkelas Dunia di Era Industri 4.0”.
20. Prof. Dr. Herawati Supolo-Sudoyo, Ph.D., menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XX (2020) dengan judul “Peran Riset COVID-19 untuk Indonesia Maju”.
21. Prof. Dr. Arif Satria, SP, M.Si. (Rektor IPB), menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XXI (2021) dengan judul “Kekayaan Hayati dan Inovasi Bioekonomi untuk Masa Depan Bangsa”.
22. Prof. Dr. Ir. Bambang Prasetya, M.Sc., menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XXII (2022) dengan judul “*Bioethic, Biosafety, Conformity Assessment* untuk Percepatan Pemanfaatan Bioteknologi dalam Mendukung Ketahanan Pangan”.
23. Prof. Dr. Ir. Jamaluddin Jompa, M.Sc., menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XXIII (2023) dengan judul “Pemberdayaan Sosial untuk Jagad Nusantara”.
24. Prof. Dr. Trina Ekawati Tallei, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture

XXIV (2024) dengan judul “Pemanfaatan Teknologi Omics dan Bioinformatics untuk Optimalisasi Manfaat Kesehatan Microgreens sebagai Pangan Fungsional”

25. Prof. dr. Dante Saksono Harbuwono, SpPD-KEMD, Ph.D., menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XXV (2025) dengan judul “Masa Depan Pengobatan Diabetes: Harapan dari Ilmu Biologi Molekuler”
26. Prof. Dr. Gono Semiadi, menyampaikan orasi ilmiah pada Sarwono Prawirohardjo Memorial Lecture XXVI (2026) dengan judul “Konservasi Keanekaragaman Hayati: Pendekatan di Era Globalisasi”

Pemberian penghargaan kepada ilmuwan karena jasa dan pengabdian serta reputasinya, baik nasional maupun internasional, dalam bidang ilmu pengetahuan yang diberi nama Penghargaan Sarwono Prawirohardjo yang ditetapkan dengan Keputusan Kepala LIPI. Adapun nama-nama penerima Penghargaan Sarwono Prawirohardjo (sekarang bernama Sarwono Award) adalah sebagai berikut:

1. Letjen (Pur.) Ali Sadikin, penerima Penghargaan Sarwono Prawirohardjo I (2002)
2. Prof. Dr. Anugerah Nontji, penerima Penghargaan Sarwono Prawirohardjo II (2003)
3. Prof. Dr. Apriliani Soegiarto, penerima Penghargaan Sarwono Prawirohardjo II (2003)
4. Prof. Dr. Taufik Abdullah, penerima Penghargaan Sarwono Prawirohardjo III (2004)
5. Prof. Dr. Syamsul Arifin Achmad, penerima Penghargaan Sarwono Prawirohardjo III (2004)
6. Dr. Setijati D. Sastrapradja, penerima Penghargaan Sarwono Prawirohardjo IV (2005)
7. Dr. Danny Hilman, penerima Penghargaan Sarwono Prawirohardjo IV (2005)
8. Prof. Dr. Mien A. Rifai, penerima Penghargaan Sarwono Prawirohardjo V (2006)

9. Dr. Amru Hydari Nazif, penerima Penghargaan Sarwono Prawirohardjo V (2006)
10. Prof. Dr. Emil Salim, penerima Penghargaan Sarwono Prawirohardjo VI (2007)
11. Prof. Dr.-Ing. Iskandar Alisjahbana, penerima Penghargaan Sarwono Prawirohardjo VI (2007)
12. Dr. Ninok Laksono, penerima Penghargaan Sarwono Prawirohardjo VII (2008)
13. Dr. Thee Kian Wie, penerima Penghargaan Sarwono Prawirohardjo VII (2008)
14. Prof. Dr. Indroyono Soesilo, M.Sc., penerima Penghargaan Sarwono Prawirohardjo VIII (2009)
15. Prof. Didin S. Sastrapradja, Ph.D., penerima Penghargaan Sarwono Prawirohardjo VIII (2009)
16. Prof. Dr. Umar Anggara Jenie, M.Sc., Apt., penerima Penghargaan Sarwono Prawirohardjo IX (2010)
17. Dr. B.R.A. Mooryati Soedibyo, S.S., M.Hum., penerima Penghargaan Sarwono Prawirohardjo IX (2010)
18. Dr. Mohammad Kasim Moosa, penerima Penghargaan Sarwono Prawirohardjo X (2011)
19. Prof. Dr. Haryono Suyono, penerima Penghargaan Sarwono Prawirohardjo X (2011)
20. Prof. Dr. Soekarja Somadikarta, penerima Penghargaan Sarwono Prawirohardjo XI (2012)
21. Prof. Dr. Thomas Djamaluddin, penerima Penghargaan Sarwono Prawirohardjo XII (2013)
22. Prof. Dr. Sri Widiyantoro, penerima Penghargaan Sarwono Prawirohardjo XIII (2014)
23. Prof. Dr. Harry Truman Simanjuntak, penerima Penghargaan LIPI Sarwono Award XIV (2015)
24. Prof. Dr. Tjia May On, penerima Penghargaan LIPI Sarwono Award XV (2016)
25. Prof. Dr. Azyumardi Azra, M.A., CBE. penerima Penghargaan LIPI Sarwono Award XVI (2017)
26. Prof. Dr. Daniel Mudiyarso, penerima Penghargaan LIPI Sarwono Award XVII (2018)

27. Prof. Dr. Terry Mart, penerima Penghargaan LIPI Sarwono Award XVIII (2019)
28. Prof. Dr. Endang Sukara, penerima Penghargaan LIPI Sarwono Award XIX (2021)
29. Prof Dr. Dwi Listyo Rahayu, penerima Penghargaan LIPI Sarwono Award XIX (2021)
30. Prof. Dr. Christofora Hanny Wijaya, penerima Penghargaan BRIN Sarwono Award XX (2022)
31. Prof. Melani Budianta, Ph.D., Penerima Penghargaan BRIN Sarwono Award XXI (2023)
32. Prof. Bens Pardamean, B.Sc., M.Sc., Ph.D., Penerima Penghargaan Sarwono Award XXII (2024)
33. Prof. Dr. Taniawati Supali, Penerima Penghargaan Sarwono Award XXIII (2025)
34. Prof. Drs. Jatna Supriatna, Ph.D., Penerima Penghargaan Sarwono Award XXIV (2026)

Tujuan

Tujuan diselenggarakannya Sarwono Award dan Sarwono Prawirohardjo Memorial Lecture adalah untuk:

1. Memberi tempat terhormat bagi para tokoh, ilmuwan, atau pakar Indonesia yang telah banyak memberikan inspirasi dan pemikirannya dalam pengembangan ilmu pengetahuan, baik di tingkat nasional maupun internasional;
2. Mewujudkan sumber daya manusia Indonesia unggul yang mampu menguasai, mengembangkan dan menyebarkan ilmu pengetahuan dan teknologi untuk kesejahteraan bangsa Indonesia;
3. Mendorong masyarakat turut serta mengembangkan ilmu pengetahuan dan teknologi di berbagai bidang.

Penerima Manfaat

Penerima manfaat Sarwono Award adalah periset yang memiliki prestasi dan kontribusi luar biasa dalam bidang ilmu pengetahuan dan teknologi serta memiliki dampak penelitian yang dapat dimanfaatkan oleh masyarakat, baik melalui Kekayaan Intelektual (KI) maupun bentuk penelitian lainnya melalui kolaborasi dengan mitra. Penerima manfaat Sarwono Prawirohardjo Memorial Lecture adalah individu/ tokoh yang berjasa dalam penemuan, pengembangan, dan penyebarluasan di bidang ilmu pengetahuan dan teknologi, serta memiliki kontribusi bagi masyarakat dan bangsa Indonesia.

Waktu dan Tempat

Kegiatan Sarwono Award dan Sarwono Prawirohardjo Memorial Lecture 2026 diselenggarakan pada:

Hari/Tanggal : Senin, 26 Agustus 2026
Waktu : 14.00 – 16.00 WIB
Bertempat : Auditorium Sumitro Djojohadikusumo
Gedung B.J. Habibie, Lantai 3 Jalan M.H.
Thamrin No. 8, Jakarta Pusat

Kriteria Pemilihan

Kriteria Pemilihan Sarwono Award dan Sarwono Prawirohardjo Memorial Lecture yaitu sebagai berikut:

1. Memiliki integritas yang tinggi kepada Negara Kesatuan Republik Indonesia;
2. Memberikan kontribusi yang berpengaruh terhadap perkembangan ilmu pengetahuan dan teknologi;
3. Aktif memberikan sosialisasi dan motivasi yang tinggi kepada masyarakat untuk menekuni bidang ilmu pengetahuan dan teknologi yang dikembangkannya;
4. Tokoh yang memberikan inspirasi dalam penyebarluasan ilmu pengetahuan dan teknologi, serta memiliki kontribusi bagi masyarakat dan bangsa Indonesia.



RUNDOWN TENTATIVE PENYELENGGARAAN "SARWONO AWARD DAN SARWONO PRAWIROHARDJO MEMORIAL LECTURE"

JAKARTA, 26 AGUSTUS 2026

WAKTU	AGENDA
13.00 - 14.00	Registrasi Peserta
14.00 - 14.10	Pembukaan Acara
	Menyanyikan Lagu Indonesia Raya
	Pembacaan Doa
14.10 - 14.20	Pertunjukan Seni Budaya
14.20 - 14.25	Pemutaran Video Profil Sarwono Award dan Sarwono Prawirohardjo Memorial Lecture 2026
14.25 - 14.30	Penayangan Rekam Jejak Riset Pemberi Orasi Ilmiah Sarwono Prawirohardjo Memorial Lecture 2026
14.30 - 15.00	Orasi Ilmiah Sarwono Prawirohardjo Memorial Lecture 2026
15.00 - 15.10	Penayangan Rekam Jejak Riset Penerima Sarwono Award 2026
15.10 - 15.15	Penyerahan Medali kepada Penerima Sarwono Award dan Pemberi Orasi Ilmiah Sarwono Prawirohardjo Memorial Lecture 2026
15.15 - 15.30	Sambutan Kepala BRIN
15.30 - 16.00	Pemberian Ucapan Selamat dan Foto Bersama





DEFORESTATION ON THE INDONESIAN ISLAND OF SULAWESI AND THE LOSS OF PRIMATE HABITAT

Jatna Supriatna, Myron Shekelle, Habiburrahman A.h. Fuad, Nurul L. Winarni, Asri A. Dwiyahreni, Muhammad Farid, Sri Mariati, Chris Margules, Bimo Prakoso, Zuliyanto Zakaria

1. Introduction

Sulawesi is part of the Wallacea hotspot, so named for Alfred Russel Wallace, the co-discoverer with Charles Darwin, of the theory of evolution. Hotspots are defined as regions of the world with at least 1500 endemic vascular plants and less than 30% of their original primary vegetation cover remaining (Myers et al., 2000; Mittermeier et al., 1998). The Wallacea hotspot overall still has about 45% forest cover, however, the percentage drops to only 15%, or about 50,774 km² when only intact forest in a pristine condition is considered (Supriatna et al., 2015).

The evolutionary history of the fauna of Sulawesi is a function of geological history and dispersal. Sulawesi has not been connected to other large islands for about 50 million years (Hall, 1996, 1998). More recently, ocean inundation, large rivers, and even unproductive low habitat quality forests, posed barriers to species dispersal (Evans et al., 2001; Whitten et al., 2002). This geological and physical history is reflected, for example, in the patterns of endemism among macaques on a fine geographic scale (Fooden, 1969; Hall, 1998; Whitten et al., 2002; Evans et al., 2003b). Other fauna showing similar patterns of endemism include fanged frogs (Evans et al., 2003a), Celebes toads (Evans et al., 2003c), flying lizards (McGuire et al., 2007), and tarsiers (Shekelle and Leksono, 2004). The narrow areas of



Sulawesi (see Fig. 2 below) represent several contact zones where macaque species may intergrade and sometimes produce hybrids. However, gene flow is low and although unlikely to be followed by speciation, may show molecular variations in mitochondrial DNA and nuclear DNA (Evans et al., 2003a).

1.1 Deforestation in Sulawesi

As elsewhere, things have changed dramatically in Sulawesi during the course of the past century. The human population has nearly quadrupled, and development has grown tremendously in Indonesia in general. In Sulawesi, the first commercial logging operation began in the early 1970s, and forests have been cleared for agriculture and for land settlement schemes like the infamous transmigration program that resettled hundreds of thousands of people from densely populated Java to other less inhabited (but much less productive) corners of Indonesia (Whitten et al., 2002). Gold and Nickel mines were opened in the early 1980s, while oil palm plantations were established in the early 1990s mostly in West Sulawesi and later in large areas in Gorontalo province. This has greatly reduced the amount of forest habitat, particularly in the lowlands, and has caused dramatic and severe declines in the populations of many forest species (World Bank, 2011). The forest cover that remains is also partly a function of rainfall and altitude. Drier areas have generally been more impacted than the wetter areas and lowland areas more so than the upper reaches of mountains. Dry forest types in general have only about 10e20% of their original area remaining, while moist and wet forest types have substantially more (FWI/GFW, 2002).

Because most of Sulawesi's pristine lowland forests had been lost nearly two decades ago, its current rate of deforestation doesn't seem too high compared to Sumatra and Kalimantan. In reality, however, should the present rate of forest loss continue, it could be catastrophic for the island's remaining wildlife and natural ecosystem services (Laurance, 1999; Butler, 2013). When deforestation occurs,



forest habitat is fragmented, isolating sub-populations from one another. Fragmentation also leads to greater access for hunting and wildlife trade (Clayton et al., 1997). The effects of forest fragmentation are exacerbated by the shape of Sulawesi, which includes long narrow areas, limiting options for dispersal and re-colonisation.

1.2 Sulawesi primates

Indonesia contains one of the most diverse primate faunas on earth. The country boasts at least 64 of the world's approximately 516 species (Mittermeier et al., 2013; Supriatna, 2019), the most recent addition being *Tarsius niemitzi* from Togean Island in central Sulawesi (Shekelle et al., 2019). Indonesia's primates represent 5 families from 9 genera, and 37 of them are endemic (Groves, 2004; Mittermeier et al., 2013; Roos et al., 2014; Supriatna and Ramadhan, 2016; Supriatna, 2019). The species are distributed across the archipelago from north Kalimantan to the south coast of Java, and from westernmost Sumatra east to Sulawesi and Timor. Indonesia contains primates of every type, from primitive 'living fossils' such as tarsiers through to the advanced apes, both the small apes (gibbons), and great apes (orangutan) (Supriatna, 2019). The greatest number of endemic primates are on Sulawesi and adjacent islands (17 species) followed by the Mentawai island group (5 species) (Brandon-Jones et al., 2004; Supriatna, 2019; Shekelle and Leksono. 2019).

Sulawesi has only two primate genera, *Tarsius* and *Macaca* but they have diversified into more species than those same genera on other islands of Indonesia and astonishingly, all 17 species are endemic to Sulawesi. Tarsiers are one of the smallest primates in the world. Adult male body weight is only 50e150 g (Shekelle et al., 2013; Supriatna et al., 2015). At least 11 species of tarsiers occur on Sulawesi and adjacent small islands (Shekelle et al., 2013; Shekelle et al., 2019). Macaques are the most widespread genus of monkeys in the world, with a total of 20 species found from African deserts to the snowy mountains of Japan. In Indonesia, 11 species occur throughout Sumatra,



Kalimantan, Java, Sulawesi, and islands in the east as far as Timor, where they have been introduced. If we include *Macaca brunescens* from Buton island and *Macaca togeanus* in the West-central Sulawesi (Froehlich et al., 1996; Evans et al., 2003; Supriatna, 2019) there would be 8 species in Sulawesi. However, as *M. brunescens* is still recognized by most authorities as *M. ochreata brunescens* and *M. togeanus* as *M. tonkeana togeanus*, we have accepted only 6 for the purposes of this analysis.

The island of Sulawesi has an importance in primate endemism that is similar in kind, though not in scale, to that of Madagascar. Sulawesi's 17 species comprise more than 27% of all primates in Indonesia. Four of the macaques are classified as vulnerable, while one, *Macaca maura*, is endangered and one other, *Macaca nigra*, is critical (IUCN, 2019). Field research suggests that there may still be undescribed tarsier species. The vertical distribution of tarsiers over a short distance in Lore Lindu National Park, where populations of *Tarsius dentatus* and *T. pumilus* possibly border or overlap vertically, suggest the strong possibility of undescribed species in the forest canopy on other parts of the island (Gursky-Doyen, 2010).

The many documented declines in forest cover and therefore primate habitat in Indonesia (for example, Supriatna et al., 2001, 2002; Mittermeier et al., 2007; Mariati et al., 2014; Supriatna and Mariati, 2014, Supriatna et al., 2017, Sloan et al., 2018), have largely been ignored by government policy makers and the private sector. Forest loss has continued to proceed at a high rate (Rijal et al., 2019). Studies on the impact of deforestation and conservation of Sulawesi primates have been carried out by Sugardjito et al. (1989) on macaques in northern Sulawesi and Supriatna et al. (1991) on macaques in southern Sulawesi. Supriatna et al. (2015) reviewed the literature on population status, habitat loss and conservation measures for selected Sulawesi primates. Hybrids and backcrosses of Sulawesi macaques are also renowned making Sulawesi an important field laboratory for the study of genetics and of primate evolution (Supriatna et al., 2015). Here we present



recent data from Sulawesi on the extent of deforestation and primate distributions, including zones of hybridization between species and propose actions that we believe will be necessary if extinctions in the near future are to be averted and primate evolution on the island is to proceed unimpeded. We take an island-wide view of current extent and rates of deforestation and the impact this is having on the habitat available to all primates and in primate hybrid zones.

2. Method

We followed the procedure adopted by Supriatna et al. (2017) in their study on the impact of deforestation on primate habitat on the island of Sumatra.

2.1 Sulawesi primates

Forest loss data were derived from Global Forest Change (GFC) Maps from 2000 to 2017. This dataset defines forest as “all vegetation taller than 5 m in height”, while forest loss is defined as the removal of tree canopy at the Landsat pixel scale (Hansen et al., 2013). The annual rate of change in forest cover was measured by comparing the area under forest cover at different times. We estimated the deforestation rate using the method of Puyravaud (2003), which is based on Compound Interest Law. The formula is as follows:

$$r = \frac{1}{t_2 - t_1} \ln \frac{A_2}{A_1}$$

Where r is the rate of forest change, while A_2 is estimated forest cover at time t_2 and A_1 is estimated forest cover at time t_1 . The GFC maps cover all primary and secondary forest but are less effective at identifying tree crops or production forests. Thus, we also obtained the forest and non-forest land use maps from the Ministry of Environment and Forestry, Government of Indonesia.



Province boundaries were added to the maps, as was the protected area dataset of the World Database on Protected Areas (WDPA).

The resulting maps of forest loss were ground-truthed with three visits in 2019, February in Northern Sulawesi, May in East Central Sulawesi and Southeast Sulawesi and June in the Southern and Western part of Sulawesi.

2.2 Mapping the distribution patterns of primates

Many researchers have carried out primate surveys in different parts of Sulawesi including Sugardjito et al. (1989), Supriatna et al. (1992), Supriatna and Ramadhan (2016) and Supriatna et al. (2017) for macaques. Tarsier surveys have been conducted by Shekelle (2008), Shekelle et al. (2017), and Rosyid (2019). Additional data on taxonomic status and distributions were gathered from Groves (2001), Brandon-Jones et al. (2004), Mittermeier et al. (2013), Roos et al. (2014) and Supriatna (2019). We examined all records of primates on Sulawesi in the Bogor Museum and updated the distribution data of Groves (2001). These were published in Supriatna and Ramadhan (2016) and Supriatna (2019).

Ground-truthing of these geo-referenced distribution maps was conducted by car throughout Sulawesi in 2018 and 2019. We ground-truthed from North Sulawesi to Gorontalo, from Makassar in South Sulawesi to Palu in Central Sulawesi and then from Central to Southeast Sulawesi at 30 locations (Fig. 1). Using GPS we checked the accuracy of forest cover and cover change maps. Dialogues were conducted with the Head of National Parks, Head of Forest Protected Areas, with farmers, scientists at the University Hasanudin, Makasar, State University of Gorontalo, University Sam Ratulangi and University Tadulako, Palu. Survey locations were chosen using the following criteria: areas likely to have species that had not been studied intensively, for example, species recently described such as *Tarsius supriatnai* (Shekelle et al., 2017); areas with species whose systematics had recently been revised; areas that had been recently logged and/or converted to plantations; and areas that had been recently burnt by forest fires. Further aspects of primate ecology and



conservation status were gathered from primatologists who have studied these issues in the field and the considerable experience of most of the present authors, especially the first two. New surveys were also made of primates in several national parks and other protected areas, and in deforested areas. During the ground truthing, the extent and current condition of the forest and local land uses were recorded.

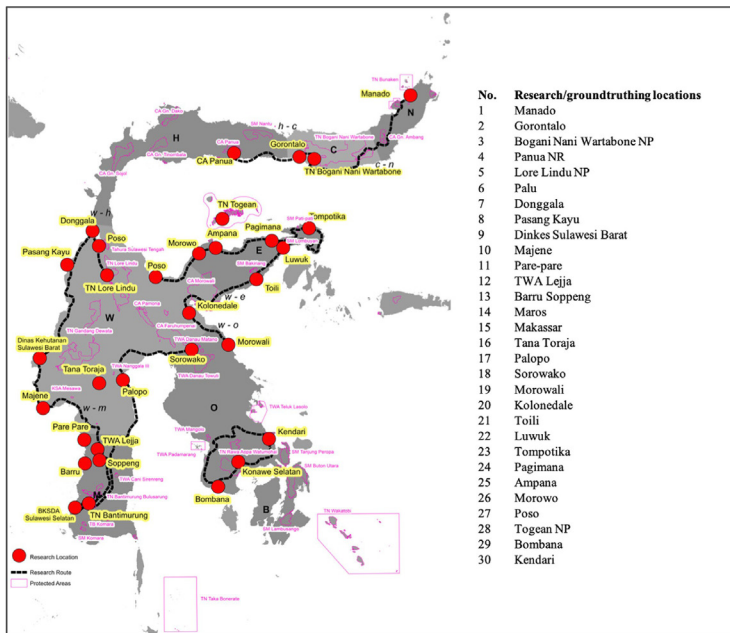


Figure 1 Ground-truthing routes in Sulawesi.

This included recording dominant agricultural plants and the ethnicity of people inhabiting the deforested land to help understand the cause of deforestation on the ground and the likely future trends in deforestation. Different people have different land use practices and traditions. For example, the Bugis people, the main ethnic group on Sulawesi, are famous for their seafaring and trading skills



but have also proved to be excellent cocoa farmers (Ruf, 2001). The Bugis have strong social networks, which have an effect on land use decisions (Weber et al., 2007).

Based on primate distribution data from all of these sources, we plotted the current known distributions of each primate species. Evans et al. (2003a) identified 6 contact zones of *Macaca* spp. in Sulawesi based on MtDNA where there is gene flow between species that may lead to hybrids. Maps of these hybrid zones had been made previously by many scientists from the Sulawesi Primate Project, a collaboration between universities in Indonesia and the United States, including Supriatna (1991) who spent two years identifying the boundaries of the hybrid zone between *Macaca maura* and *M. tonkeana*. Bynum et al. (1997) and Bynum (2002) identified the contact zone between *Macaca tonkeana* and *M. hecki*. Riley et al. (2007) found the boundaries between *M. tonkeana* and *M. ochreata*. Groves (1990, 2004) identified the hybrid zone between *M. hecki* and *M. nigrescens*. We mapped the locations of these zones and measured forest loss in buffers of 10 km, 25 km, and 50 km around contact zones because previous studies predict gene flow up to 50 km (Supriatna, 1996). We then overlaid these geo-referenced distribution maps onto current forest cover maps and maps of forest lost between 2000 and 2017. In this way, we mapped changes in available habitat for all primate species and calculated current available habitat, defined as forest cover.

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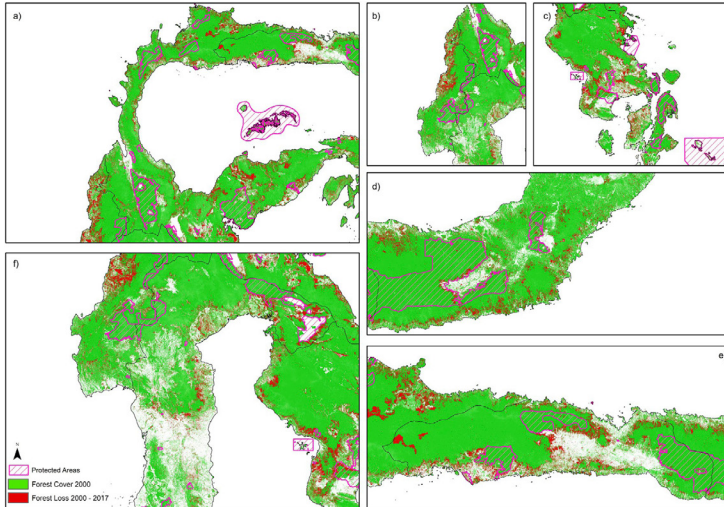


Figure 2 Map of Sulawesi showing changes in forest cover between 2000 and 2017 (a. Central Sulawesi, b. West Sulawesi, c. Southeast Sulawesi, d. North Sulawesi, e. Gorontalo).

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3. Result

Our results showed that deforestation was variable among the provinces. West Sulawesi and Southeast Sulawesi were the provinces which had the greatest extent of deforestation; both total deforestation and deforestation per year (Fig. 2, Table 1). The forest lost from the western part of West Sulawesi has been converted into agricultural land where it is mainly used for oil palm. In Southeast Sulawesi newly cleared forest land is used for mixed agriculture including oil palm, maize and cocoa as well as nickel mining.

Table 1 shows that 2,069,016.66 ha of forest cover was lost in Sulawesi between 2000 and 2017, which is 10.89%. Every province was affected. The greatest forest loss, 737,516.52 ha was in Central Sulawesi Province. The average rate of deforestation in the provinces of Sulawesi ranged from 0.42% to 0.85% each year. The highest rate was found in Southeast Sulawesi Province with 0.85% each year. The overall average deforestation rate was 0.67%. Rijal et al. (2019) assessed forest loss on Sulawesi from 1990 to 2018 and found that overall Sulawesi experienced 18.90% forest loss during their study period in contrast to our 10.89%. The difference may be ascribed to the decade of the 1990s when much of lowland Sulawesi was cleared for crops.

M. ochreata in Southeast Sulawesi and *T. pelengensis* on Peleng island of Central Sulawesi lost the most habitat at 14% but were closely followed by *M. hecki* and *M. tonkeana* (Table 2). *Tarsius niemitzi* on Togean Island, Central Sulawesi experienced the lowest loss of forest habitat at only 1%. Some of the species that occur on small islands have lost a lower percentage of their habitat than others, for example, *T. tumpara*, *T. sangiriensis*, and *T. tarsier* (Table 2). However, the habitat available to them was already small, less than 10,000ha, so the loss is significant. There are no conservation management plans or protected areas covering the habitat of these small island or restricted area species. Others occur naturally in restricted habitat. For example, *T. pumilus*, occurs only on the top of Rano-rano and Lore Katimbu Mountains in Lore Lindu NP.



Table 1 Changes in Forest Cover in Sulawesi Between (2000) and 2017 with total deforestation and average rate of deforestation.

Province	Tree Cover 2000 (Ha)	Tree Cover 2017 (Ha)	Loss in 2017 (Ha)	Deforestation (%)	Average rate
Gorontalo	1,207,487	1,072,936	134,550	11.14	0.69
North Sulawesi	1,572,137	1,463,803	108,334	6.89	0.42
West Sulawesi	1,768,821	1,531,585	237,236	13.41	0.84
Southeast Sulawesi	3,859,144	3,342,803	516,341	13.37	0.85
South Sulawesi	3,917,567	3,582,528	335,038	8.55	0.52
Central Sulawesi	6,675,301	5,937,785	737,516	11.04	0.68
TOTAL	19,000,457.82	16,931,441.16	2,069,016.66	10.89	0.67

Table 2 The loss of primate forest habitat in and outside protected areas between 2000 and 2017 (NS: North Sulawesi, CS: Central Sulawesi, SE: Southeast Sulawesi, GR: Gorontalo, SS: South Sulawesi).

English name	Scientific name	Total forest cover (ha) (% loss)	Non PA	Protected Area (PA) and National Park (NP)	Forest cover in PAs/NPs (% loss)
Tonkean Macaque	Macaca tonkeana	9,541,000 (11%)		Lore Lindu NP(CS), Morowali PA (CS)	981,000 (4%)
Supriatna	Tarsius	1,988,000 (12%)		Nantu PA (GR)	193,000 (3%)
Tarsier Siau Island	supriatnai Tarsius	12,000 (3%)	Siau Island	None	None
tarsier Peleng	tumpara Tarsius	265,000 (14%)	(NS) Peleng Island		1000 (1%)
Moor Macaque	pelengensis Macaca	1,019,000 (5%)	(CS)	Bantimurung Bulusaraung NP (SS)	68,000 (2%)
Heck's Macaque	maura Macaca hecki	2,674,000 (12%)	Sangihe	Gunung Dako PA (CS), Gunung Tinombala PA (SE), Nantu PA (GR), Pamona PA (CS), Panua PA (GR), Teluk Apar PA (NS)	269,000 (3%) 33,000 (5%)
Great Sangihe	Tarsius	176,000 (3%)			
Tarsier Gorontalo	sangirensis Macaca	803,000 (8%)	Island (NS)	Bogani Nani Wartabone NP (GR)	297,000 (2%)
Macaque Crested	nigrescens Macaca	850,000 (7%)		Gunung Ambang PA (NS), Tangkoko Dua Sudara PA (NS), Gunung	70,000 (5%)



English name	Scientific name	Total forest cover (ha) (% loss)	Non PA	Protected Area (PA) and National Park (NP)	Forest cover in PAs/NPs (% loss)
Macaque Booted	nigra Macaca	3,438,000 (14%)		Manembo Nembo PA (NS) Rawa Aopa Watumohai NP(SE)	328,000 (8%)
Macaque Dian Tarsier	ochreata Tarsius	4,262,000 (10%)		Lore Lindu NP (CS)	655,000 (4%)
	dentatus				
Wallace Tarsier	Tarsius wallacei	1,168,000 (10%)	Uwemaje (ST), Sigi (CS)		104,000 (4%)
Lariang Tarsier	Tarsius	2,413,000 (11%)	Lariang river		212,000 (1%)
Sulawesi	lariang Tarsius	682,000 (12%)	basin (CS)	Lore Lindu NP (CS)	168,000 (3%)
Mountain Tarsier Makassar	pumilus Tarsius	1,019,000 (5%)		Bantimurung Bulusaraung NP (SS)	68,000 (2%)
Tarsier Selayar Tarsier	fuscus Tarsius	64,000 (6%)	Selayar (SS)	None	None
	tarsier				
Togean Tarsier	Tarsius	58,000 (1%)		Togean NP (CS)	58,000 (1%)
	niemitzii				

3.1 Macaque contact zones

All contact zones experienced forest loss. The zone between *M. tonkeana* west and *M. hecki* experienced the lowest loss, following by zone between *M. hecki* and *M. nigrescens*. The greatest losses occurred at contact zones between *M. tonkeana* west and *M. ochreata* (Fig. 3 and Table 3). Fig. 3 shows a contact zone between *M. tonkeana* east and *M. tonkeana* west. Evans et al. (2001, 2003a) split *M. tonkeana* into an eastern and a western population based on their mtDNA and Y chromosome microsatellites analysis, which indicated that the eastern and western populations of *M. tonkeana* diverge and may even be more divergent than adjacent populations of *M. tonkeana* west and *M. maura*.

To some extent, people growing commodities have been responsible for deforestation in and around protected areas in Sulawesi (Table 4). Corn, coffee, cocoa, and oil palm are the commodities that are now thriving in Sulawesi. Corn and coffee can be found mainly in highland areas, where most protected areas are, while cocoa can be found in



non-protected mountain areas except where it is grown in Lore Lindu National Park. Oil palm is found mostly in West Sulawesi, Southeast Sulawesi and Gorontalo provinces where most plantations are run by big companies. Bugis people do not favor oil palm plantations but rather become small holders that mostly encroach on protected areas and mountainous parts of forests where they grow corn, cocoa and coffee.

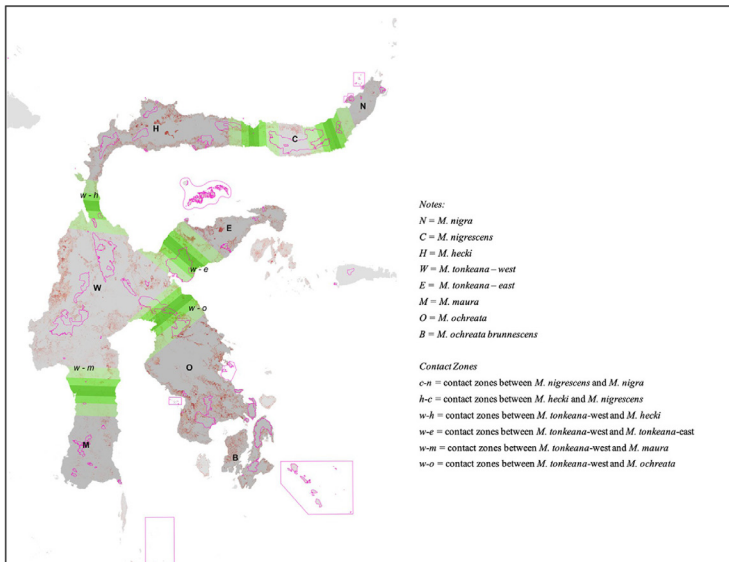


Figure 3 Deforestation around contact zones of *Macaca* spp. in Sulawesi showing buffers of 10 km, 25 km, and 50 km in different green shades and protected areas (in pink). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

4. Discussions

Preventing rapid biodiversity loss requires efficient allocation of conservation efforts (Pimm et al., 2001) within biodiversity hotspots those areas where concentrations of endemic species clash with high levels of human activity (Myers et al., 2000). As with many large islands, the biota of Sulawesi is highly distinctive, but this island is too



large to protect in its entirety. Therefore, designation of conservation areas requires a detailed understanding of species distribution patterns and patterns of endemism (Margules and Pressey, 2000). All 17 Sulawesi primates are endemic to the island and the contact zones between macaques are of particular interest to primatologists who regard the island as a natural field laboratory for the study of evolutionary biology. Primates are very good umbrella indicators of change in other species because they disperse the seeds of many trees (Lambert, 2010) helping to maintain diversity and healthy populations of those forest species. According to IUCN, the main threats to primates are loss of habitat due to clearing for agriculture (76% of species), logging and wood harvesting (60%), live-stock farming and ranching (31%), and direct loss due to hunting and trapping (60%) (Estrada et al., 2017). Other threats, such as habitat loss due to road and rail construction, oil and gas drilling and mining, affect 2e13% of primate species. There are also emerging threats, such as pollution and climate change.

The Government of Indonesia issued a moratorium in May 2011 to prohibit district governments from granting new forest concession licenses (President Instruction No. 10; Fajar, 2013), which was extended and is still in force today, despite some opposition from powerful palm oil interests (Butler, 2013). This moratorium covered licenses for three types of activities: (i) conversion of primary forests and peatlands to oil palm plantations (oil palm concessions); (ii) conversion of primary forests and peatlands to fast-growing tree plantations for pulp and paper (timber concessions); and (iii) logging of commercially valuable tree species in forests (logging concessions) (see also Supriatna et al., 2017). The current moratorium area of approximately 65 million hectares protects much smaller areas than the moratorium would suggest (Sloan et al., 2018). Around 4.5 million ha were removed from the moratorium for mining and agro-industries, and a further 5.5 million ha may also become exempt, and there are still overlaps with current forest licenses. This is likely due to a lack of clarity of maps of the moratorium areas. Even so, the moratorium is an



important of government policy and will help to protect the forests of Sulawesi.

Table 3 Forest loss (ha) at macaque contact zones with different sized buffers.

Contact Zones	10 Km Buffer	25 Km Buffer	50 Km Buffer
c-n (<i>M. nigrescens</i> and <i>M. nigra</i>)	12,258	33,017	55,810
h-c (<i>M. hecki</i> and <i>M. nigrescens</i>)	10,198	36,121	69,905
w-e (<i>M. tonkeana</i> -west and <i>M. tonkeana</i> -east)	18,817	66,617	140,195
w-h (<i>M. tonkeana</i> -west and <i>M. hecki</i>)	4141	12,204	48,012
w-m (<i>M. tonkeana</i> -west and <i>M. maura</i>)	10,296	33,858	70,288
w-o (<i>M. tonkeana</i> -west and <i>M. ochreata</i>)	25,771	85,270	152,332

Table 4 Ecosystem types, commodities, and people living in and around deforested land who may influence future trends in deforestation, in the Provinces of Sulawesi (Migrant: People who migrated from Java and Bali, Bugis; Largest indigenous tribe from South Sulawesi; PA = Protected area; NP = National Park; APL = Area Penggunaan Lain (Area for Other Land Uses)).

Locationy Landscape type	Land status	Ecosystem types	Dominant Crops/mining	Ethnic groups
North Sulawesi				
Tangkoko Batuangus	PA	Mountain	Corn	Minahasa (local)
Gunung ambang	PA	Mountain	Corn	Minahasa (local)
Manembo-nembo	PA	Lowland	Corn	Minahasa (local)
Gorontalo				
Boganiwartabone	NP	Lowland	Corn	Gorontalo (local), Minahasa (migrant)



Locationy Landscape type	Land status	Ecosystem types	Dominant Crops/mining	Ethnic groups
Nantu	PA	Lowland	Corn/oil palm	Gorontalo, Java, Bali (migrant)
Bolahemo	APL	Lowland	corn	Gorontalo, Java (migrant), Minahasa (migrant)
Central Sulawesi				
Buol	PA and APL	lowland	Oil palm	Buol (local), Java (migrant)
Lore Lindu	NP	Mountain	Cocoa	Kaili (local), Bugis (migrant)
Bongka (Pangkonene)	PA	Lowland	Corn	Pangkonene (local), Bugis (migrant)
Luwuk	APL	Lowland	Corn/Palm oil	Kaili (local) and Java (migrant)
Morowali	PA and APL	Lowland	Palm Oil/ Mining	Morowali (local)
Southeast Sulawesi				
Rawa Aopa	NP	Lowland	Corn	Bugis (migrant)
Tinangea	APL	Lowland	Oil Palm	Tolaki (local)
La Solo	APL	Lowland	Oil Palm/corn	Tolaki (local), Bugis (migrant)
West Sulawesi				
Pasang kayu	APL	Lowland	Oil palm	Mandar (local), Bali (migrant)
Mamuju Tengah	APL	Lowland	Oil Palm	Mandar (local) (migrant)
Mamuju Selatan	APL	Lowland	Oil Palm	Mandar (local)
Gandang Dewata	NP	Mountain	Corn	Bugis (migrant)
South Sulawesi				



Location Landscape type	Land status	Ecosystem types	Dominant Crops/mining	Ethnic groups
Enrekang	APL and HL	Hilly	Coffee, Cocoa and Corn	Bugis (local)
Toraja	APL and HL	Hilly	Coffee, Cocoa, Corn	Bugis (local)
Palopo	APL	Lowland	Mixed Corn	Bugis (local)

5. Drivers of deforestation

5.1 Logging

Sulawesi has so far suffered less from the loss of forest cover than Sumatra or Kalimantan (FWI, 2014; Gaveau et al., 2009; Supriatna et al., 2017; Alamgir et al., 2019). This is due largely to the lack of the available lowland forest, fewer commercial tree species and large areas of rugged relatively inaccessible karst forest (Whitten et al., 2002; Bickford et al., 2007; Supriatna et al., 2015). However, Sulawesi is now on the cusp of major change. While logging itself does not necessarily cause deforestation, if it is followed by conversion to agriculture and plantations then deforestation occurs. Miettinen et al. (2011) suggested that logging is a main source of deforestation in Sulawesi because companies often cannot prevent local cooperatives, farmers' associations, village organizations, fake companies, and smallholders from encroaching on their logging concessions. Logging followed by conversion to agriculture has been widespread in Indonesia and continues to occur over and over again (Gaveau et al., 2009). This practice was identified in discussions with several stakeholders including the head of the Forestry Office in West Sulawesi and the head of Rawa Aopa National Park in Southeast Sulawesi during a visit in 2019. While logging occurs mostly in logging concessions, illegal logging constitutes a well-organized criminal enterprise, which is bold enough to put pressure to forestry law enforcement authorities (Supriatna et al.,



2017). Illegal logging occurs in concession areas as well as expired concessions and protected areas.

Indonesia was the world's fourth-largest emitter of global warming pollution in 2016, and deforestation accounted for about 40 percent of those emissions (Wijaya et al., 2017). Indeed, for that same year Indonesia ranked second behind Brazil in the amount of global warming pollution it produced because of deforestation (Wijaya et al., 2017). Since the 1980s, the extraction of hardwoods has increased in Indonesia in response to an ever expanding worldwide demand for tropical timber.

This has resulted in deforestation and new economic incentives to construct roads in forested areas (Alamgir et al., 2017). In Lore Lindu National Park of Central Sulawesi, the changing of subsistence livelihoods from farming to fishing has led to the loss of hardwoods, which are used to make dugout canoes (Riley, 2007). Although some primate species can survive temporarily in logged forests, both legal and illegal logging result in a decrease in canopy cover, reduced humidity in the sub-canopy and undergrowth that increases tree mortality and the incidence of ground fires. A decline in forest undergrowth inhibits the regeneration of large tree species that provide food, resting sites, and refuges for primates (Lewis et al., 2015; Peres, 1999, 2001; World Bank, 2016).

Many experts believe that the main actors in illegal logging are: (a) workers from communities around local forest areas; (b) investors, including traders, concession holders, or holders of legal timber cutting permits (IPK), and buyers of illegal timber; and (c) government and military officials including law enforcement personnel and certain legislators (Supriatna et al., 2002). Illegal land clearings are seen in many protected areas in Indonesia including in Sulawesi (Bickford et al., 2007). But currently the issue of logging has changed dramatically with a new policy initiative from China called the belt and road initiative (BRI). North and central Sulawesi are likely to be main destinations of BRI



investment in Indonesia (Damuri et al., 2019). This may lead to increased road development, which increases access and provides opportunities for encroachment into the forests that remain (Venter et al., 2016; Sloan et al., 2019).

5.2 Oil palm

The recent high growth in palm oil production is likely to continue for the foreseeable future. Because of its high yield (about five to eight times more volume per hectare than the yields of its closest oil-crop competitors) and relatively low labour costs (sometimes due to forced or child labour), oil palm is the most inexpensive vegetable oil on the market today (Carter et al., 2007). In Sulawesi, oil palm is one of the industrial concessions responsible for forest loss although logging concessions are still considered to have the greatest impact (Abood et al., 2015). This study suggests that agricultural commodities grown in areas surrounding the forests, and which may increase forest loss by encroachment are primarily corn and oil palm (Table 4). Oil palm is mostly managed by companies while corn and cocoa are mainly planted by local communities especially Gorontaloese and Buginese. A most interesting finding was that most Buginese were not involved in palm oil plantations. Most of are proud owners not workers. Oil palm development in southern Sulawesi, where the Buginese mostly live, is locally owned and small scale. Emissions due just to oil palm cultivation in Indonesia accounted for an estimated 2 to 9 percent of all tropical land use emissions from 2000 to 2010 (Carlson and Curran, 2013).

5.3 Mining

Mining is a persistent threat to primates and their habitats. The mining of precious gems and minerals contributes to habitat destruction, fragmentation, deforestation, and the poisoning and pollution of soil and ground water (Alvarez-Berrios and Aide, 2015). In Sulawesi, nickel accounts for most mining output, followed by gold and copper. Nickel



is found in Central, South and Southeast East Sulawesi. Central and Southeast Sulawesi in particular are affected by large mining operations, especially nickel. IMIP, the International Morowali Industrial Park in Central Sulawesi, established with Chinese investments, hosts nickel mining industries from cradle to grave; from mining to smelter and end products for export to China (Song et al., 2018).

5.4 Corruption

Corruption is a major threat to primates because it distorts environmental laws, giving way to deforestation and land speculation and promoting poverty and illegal activities, including mining, poaching, logging, and the primate trade. Corruption and inequality interact by generating a vicious circle of greed, the unequal distribution of power in society, and the unequal distribution of wealth. The 2016 Transparency International Corruption Perception Index-CPI (0: highly corrupt to 100: very clean) profiling 176 countries (Transparency International, 2018) ranks Indonesia at 90, with a score 37. Corruption hampers efforts directed at wildlife conservation and weakens protected area capacity to prevent drivers of primate habitat loss and local species extirpation. Laws are often skirted around or ignored through bribery and extortion. For example, trading orangutans in Indonesia is a crime but 440 confiscations in the last 25 years have led to only seven convictions and sentencing was lenient (Nijman, 2017).

Complicity between businesses and politicians had led to the theft of billions of dollars in revenue from national economies, benefitting the very few at the expense of the many and impeding sustainable development (Baaz and Olsson, 2011; Transparency International, 2018). Given high levels of corruption and prevalent low human development, country-wide conservation of primate habitats and populations developing tropical countries remains a complex challenge. Moreover, measurements of the effectiveness of governance require a thorough causal analysis (with counterfactuals) to determine the degree to which the current status of individual primate species is best



attributed to good policies that are poorly implemented, the continuation of ineffective policies, or the result of strong and effectively managed policies (see Baylis et al., 2016).

5.5 Impact of deforestation on primates

The last review of the distribution, population sizes, and conservation status of Sulawesi primates was carried out in 2013 by Supriatna et al. (2015) and there have been no published studies since then. However, information on the status of many species can be found in some local publications and student theses that were consulted here. Shekelle et al. (2013) found that tarsiers living on the offshore islands of Sulawesi (*T. pelengensis*, *T. sangiriensis*, *T. tarsier*, *T. tumpara*) do not occur in protected areas. The accidental exception is a new species described recently from the Togean islands (*T. niemitzi*), which occurs in a small pocket of forest in the Togean Marine National Park (Shekelle et al., 2019).

Another newly described species, *Tarsius supriatnai* (Shekelle et al., 2018), is also facing threats due to deforestation. Our results show that the species has suffered the loss of 12% of its habitat. Since 2008, it has been the policy of Gorontalo Province to boost the expansion of corn, which may well see the loss of more of this species' habitat in the near future. Conversely, *Macaca tonkeana*, is probably more secure than other Sulawesi primates due to its widespread distribution within central Sulawesi (Supriatna et al., 2015).

Fragmentation may restrict the dispersal of primates. As their home ranges or territories become limited, sub-populations become more isolated from one another, and there is increased competition for habitat that has been reduced in area (Saunders et al., 1991; Monaghan et al., 2001; Supriatna et al., 2017). Limited home ranges and the isolation of sub-populations may lead to population declines. Small populations are less viable than large ones (Cowlshaw and Dunbar, 2000). The road construction which accompanies the development of plantations such as those described above indicate that habitat fragmentation will



become increasingly widespread in the future. In Sulawesi, the largest infrastructure development is the railroad from Makassar in southern Sulawesi to Pare-pare, approximately 150 km to the north which is likely to expand to other areas. Accessibility created by deforestation will increase the probability of hunting success to the detriment of many primate species (Riley, 2008; Riley and Priston, 2010) and in turn will increase the number of primates in the market as well as affect the density of primate species in the forest (O'Brien and Kinnaird, 1996; Lee et al., 2005).

5.6 Deforestation in hybrid zones

Hybrid zones of many species in Sulawesi have been recognized by many researchers since 1984 (see Groves, 1984; Supriatna, 1992; Evans et al., 2001; Evans et al., 2003a; Evans et al., 2003b; Bynum, 2002; Bynum et al., 1997; Riley, 2007; Hamada et al., 2006; Hamada et al., 2012; Hamada et al., 2016; Ito et al., 2015; Schillaci et al., 2005). Many hybrid zones are in the contact zones between parapatric species with two possible consequences of contact. One is that they may eventually produce a new species. The other is that they continue to hybridize without significant changes in genetic compositions as long as gene flow is low (Evans et al., 2001). Some of the hybrid zones are narrow such as that between *M. tonkeana* and *M. hecki* (Watanabe and Matsumura, 1991; Bynum et al., 1997) and even so narrow that they could not be seen clearly, such as that between *M. nigra* and *M. nigrescens* in the Bogani Nani Wartabone National Park in Gorontalo. There, camera trapping has revealed that the two species do not have overlapping ranges (Johnson et al., 2019). Thus, it is possible that this may no longer be regarded as a contact zone with gene flow. Other zones are wide. Supriatna (1996) found the zone of the hybrid between *M. tonkeana* and *M. maura* to be approximately 35 km from north to south, which is the widest hybrid zone thus far found in the primates.

The greatest loss of forest occurred at the contact zone between *M. tonkeana* and *M. ochreata*. *M. ochreata* also suffered the greatest loss of forest habitat; 14%. *Ochreata*



tonkeana hybrids have been found in Faruhumpenai Nature Reserve close to villages. The reserve is surrounded by a cacao plantation (Riley et al., 2007). Deforestation may pose severe threats to the hybrids and their habitat as agriculture is continuing to expand in the contact zones.

The extent of deforestation in the hybrid zones is alarming. Deforestation will likely continue as none of the contact zones are represented in Protected Areas. In central Sulawesi, the project to widen a road through the very narrow contact zone between *M. tonkeana* and *M. hecki* will see even more people occupy this contact zone illegally. Table 4 shows that the forests of the Enrekang region, which are in the hybrid zone between *M. maura* and *M. tonkeana* are being replaced by corn, cocoa, and coffee. The Bugis people are likely to continue this process. Forest fragmentation is just as likely to have an impact on populations of hybrid macaques as on true species, as discussed above. It may also be affecting other species of hybrid animals such as toads (Evans et al., 2003a).

Endemism on Sulawesi is partitioned; because of this, to best preserve biodiversity, areas with complementary, non-redundant diversity should be targeted for protection (Margules et al., 1988; Vane-Wright et al., 1991; Margules and Pressey, 2000; Margules and Sarkar, 2007). Unfortunately, the current distribution of protected areas indicates that some large conservation areas such as Lore Lindu and Morowali National Parks may be restricted to a single area of genetic endemism (West Central) while other areas of genetic endemism such as East Central, Northwest, and Southwest Sulawesi are hardly protected at all (Table 2; Whitten et al., 2002). However, substantial portions of each of these regions have been proposed for protection including Bakiriang in East Central Sulawesi, Mt. Lompobatang in Southwest Sulawesi, and the Palu Mountains, Mt. Sojol, Mt. Dako, the Toli-Toli Mountains, and the Marisa complex in Northwest Sulawesi (Whitten et al., 2002). The addition of these sites would complement the biodiversity present in the existing reserve network improving its coverage of biodiversity greatly (Evans et al., 2003a).



Whenever new protected areas are created, it is necessary to balance the cost in foregone opportunities for profit making enterprises with the protection of biodiversity. This requires the simultaneous consideration of multiple, often conflicting goals. Multicriteria analysis (MCA) can be used to compare land use options and identify trade-offs (Sarkar and Illoldi-Rangel, 2010). In macaque contact zones this means trading off various forms of agriculture against the protection of macaques. Using MCA it would be possible to measure the cost in say, foregone opportunities for oil palm, corn or cacao plantations of creating protected areas and conversely, the cost to potential hybrid populations that would result from a given increase in the area of plantations. This is a decision support tool that would allow all stakeholders to examine alternative scenarios and possibly agree to an overall plan they can all live with.

5.7 Deforestation in national parks and other protected areas

Protected areas represent a potentially effective conservation tool in which local, state, and national governments can act to protect ecosystems and provide resources to conserve animal and plant populations, provided that these areas also contribute to alleviating rural poverty (Adams and Hutton, 2007). Globally, protected area networks tend to be located in ecosystems that have low value and low demand for land conversion, and are inexpensive to protect, meaning that many are located far from areas of high biodiversity (Joppa and Pfaff, 2009). In Sulawesi, many protected areas have been encroached upon by small holders especially migrants from South Sulawesi to grow commodities such as coffee, cocoa and corn and to operate small local mines. As a result, where encroachment has degraded the forest, primate rich lowland forests are at risk. This is because companies can argue that they are already degraded and lowland forests offer profitable opportunities to obtain land well suited to industrial agriculture (Venter et al., 2016) or clear cutting for timber and gold mining (Supriatna et al., 2015).



Protected areas in Sulawesi generally cover regions with extremely rugged terrain, or with slopes or elevations unsuitable for agriculture. Most of the largest national parks and protected areas are located in the mountain ranges in the middle of Sulawesi. The exception is Rawa Aopa Watumohai in south east Sulawesi. Most Sulawesi primates occur in lowland forest or forests of lower slopes, which are not well represented in protected areas. Densities of fauna in most protected areas are therefore already low and will decline further unless dispersal between them is facilitated by, for example, corridors of natural habitat. Encroachment by people makes restoration and conservation of such corridors increasingly difficult. The protected areas themselves face a number of basic management problems, including poor staff morale and discipline; lack of incentives for good performance by staff; limited capacities and training; emphasis on park infrastructure rather than enforcement or awareness raising activities; budget allocations made according to previous budgets rather than threats or needs on the ground at the present time; and emphasis on administration rather than field duties for park managers (Supriatna et al., 2002).

In addition, there is usually no support from local communities and decisionmakers for national parks. There are many overlapping and conflicting claims to lands within protected areas. According to newspaper reports, this situation has worsened with decentralization and new perceptions of local community land rights. Many people have submitted claims to courts based on the perceived illegality of the original creation of national parks. If these claims are successful, up to 50% of high conservation lowland forest would be at risk (Supriatna et al., 2017). The purpose and intention of parks have usually been noted on the provincial spatial plan or forest land use map, but little action leading to official gazettal is evident. It is only when local governments (governor, regent) have passed decrees based on field level consultations with local communities, that an area can be legally gazetted, as set forth in a final decree issued by the Minister of Forestry. There is little incentive for this to happen.



Changing production forests into national parks by converting the tenure of logged over areas would seem, on the face of it, to be a secure and effective way of reducing deforestation. Issues with conflicting land tenure claims, imprecise boundaries and differences between adat (traditional) law and government law are recurring issues throughout Indonesia (for example, Riggs et al., 2016) that need to be resolved to secure primate habitat into the future.

5.8 Development policy

Forest loss is exacerbated by many factors including government policy on forest use. Since 1999, central government has decentralized the management of forests, except those in conservation areas, to local governments. This policy was renewed in 2004, although in 2014 management responsibility moved from regency to provincial governments. So between 1999 and 2014, regency governments have been allowed to allocate 100ha forest concessions to be logged by small-holders and communities without appropriate planning and without an understanding of forest ecology (Supriatna, 2019). Local access to local natural resources is an ethical imperative, but it is necessary to balance local interests with public goods (Sayer et al., 2017), which is a role of governments. It is not always clear how such trade-offs are made, if they are made at all. In response to the need to reduce poverty, the Province of Gorontalo has implemented what is known as an agropolitan policy (agriculture driven development), in which development is based on agribusiness systems (Bahua et al., 2013). This can be seen in the forest cover change of Gorontalo (Fig. 1). Industrial agricultural development has been followed by infrastructure development or vice versa. As discussed above, road infrastructure in particular has flow on effects by improving the accessibility of new land to both locals and migrants. Recently, since a new road was built close to Nantu Protected area in Gorontalo Province, oil palm has grown significantly compared to what it was 10 years ago.



6. Conclusions

Conflict between the need for human livelihoods and the need to protect primates, especially endangered species such as *M. maura* and *M. nigra*, will only continue to increase. We demonstrate here that deforestation rates have increased in the habitats of all of the primates of Sulawesi. Although not yet as severe or dramatic as deforestation rates in Sumatra, drivers of deforestation in Sulawesi are increasing in intensity. Deforestation is the result of legally converting natural forest into agricultural products, such as oil palm, corn and cocoa, and illegally logging the forests, even in protected areas and national parks. This problem is exacerbated by the fact that Indonesia remains largely an agricultural country. A significant proportion of the population relies on farming for survival. Population pressure and the lack of off-farm employment lead to demands for more agricultural land, which can only come at the cost of forests. With recent taxonomic revisions, some tarsiers such as *T. larian* (Western Sulawesi), *T. tumpara* (Siau island), and *T. tarsier* are not found in protected areas at all. The remaining habitat of these three species, covering only a few thousand hectares, is not enough for them to survive unless the forest remnants in which they occur become protected and carefully managed.

Following Supriatna et al. (2017) we conclude with a call for greater effort to control the further loss of forest habitat, more careful integration of conservation and development by making trade-offs explicit and conducting transdisciplinary research on social ecological systems at the interface of policy and management at local scales (Langston et al., 2019). The results presented here now constitute a baseline against which improvements can be monitored. Habitat degradation cannot be allowed to continue if many of Sulawesi's primates are to survive. Enforcement of existing regulations, disentanglement of land claims and overlapping boundaries, phasing out logging in existing forests, a strategic approach to road building that avoids areas occupied by threatened species and minimizes forest fragmentation, clarification of how



adat (traditional) law relates to protected areas, and the creation of new, enforceable laws protecting species from trade and exploitation will all be needed if Indonesia is to uphold its stated commitment to primate conservation in Sulawesi.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

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Jatna Supriatna meraih gelar magister dan doktor dalam bidang biologi dan antropologi dari University of New Mexico di Amerika Serikat masing-masing pada tahun 1986 dan 1991, dan kemudian melakukan penelitian postdoktoral di Columbia University di New York. Ia juga mendapatkan pelatihan manajemen di Massachusetts Institute of Technology (MIT) di Boston, Amerika Serikat. Ia adalah seorang peneliti, pengamat, dan aktivis lingkungan hidup dan konservasi. Ia memulai karier sebagai peneliti di LIPI dan kemudian menjadi dosen serta profesor di Universitas Indonesia. Ia selalu terlibat dalam kegiatan mengajar mahasiswa dan menginspirasi banyak pihak untuk bekerja di bidang konservasi. Dari tahun 1995 hingga 2010, ia menjabat sebagai Direktur Eksekutif dan kemudian Wakil Presiden Conservation International di Indonesia. Ia adalah seorang visioner di bidang konservasi. Pada tahun 2010, ia mendirikan Climate Change Research Center (RCCC UI) di Universitas Indonesia untuk menanggapi isu perubahan iklim yang semakin berkembang. Ia diangkat sebagai Co-chair United Nations Sustainable Development Solutions Network (UN SDSN) pada tahun 2013. Pada tahun 2018, ia mendirikan Institute for Sustainable Earth and Resource (ISER) dan pada tahun 2020 mendirikan SDG Hub di Fakultas Matematika dan Ilmu Pengetahuan Alam (FMIPA) UI sebagai bagian dari upaya mendorong perguruan tinggi berkontribusi terhadap Sustainable Development Goals (SDGs). Pada tahun 2019, ia diminta oleh Dekan Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Indonesia untuk memimpin sebuah lembaga baru, “Lembaga Sains Terapan (LST)”, dan berakhir tahun 2023.



Lembaga ini telah menjadi salah satu dari empat organisasi terbesar di Universitas Indonesia. Pada tahun 2012, ia diangkat sebagai anggota Komisi Ilmu Dasar Akademi Ilmu Pengetahuan Indonesia (AIPI). Pada tahun 2018, ia terpilih sebagai Ketua Perkumpulan Sarjana Lingkungan Indonesia (PERWAKU). Selain itu, ia pernah menjabat sebagai anggota Majelis Wali Amanat (MWA) Universitas Indonesia pada periode 2014–2019 dan duduk di dewan penasihat berbagai organisasi, termasuk Yayasan Upaya Indonesia Damai, Yayasan Konservasi Indonesia, Bornean Orangutan Society Foundation, The Conversation Indonesia Foundation, Yayasan CSF, Yayasan Owa Jawa, Yayasan Ekologi dan lain-lain. Di tingkat internasional, sejak tahun 2019, ia menjadi anggota Board of the National University of Singapore – Center for Nature-Based Climate Solutions, serta menjadi Co-chair Southeast Asia Primate Specialist Group, IUCN. Ia juga adalah profesor Biologi Konservasi di Departemen Biologi FMIPA Universitas Indonesia. Sejak tahun 2022, ia telah membimbing dan mempromosikan lebih dari 50 program magister dan doktor di Departemen Biologi FMIPA dan Sekolah Ilmu Lingkungan, semuanya di Universitas Indonesia. Ia telah mempublikasikan lebih dari 240 artikel ilmiah di jurnal internasional bereputasi, termasuk Science, Nature, Current Biology, Conservation Biology, Scientific Reports, Global Ecology and Conservation, Sustainability, Discover Sustainability, dan lain-lain, serta 30 buku tentang lingkungan dan konservasi. Ia juga menjadi editor untuk beberapa jurnal ilmiah dari organisasi internasional, termasuk Tropical Conservation Science, Wildlife Policy and Law, Parks dari IUCN, Asian Primate Journal dari IUCN, dan Biosphere Conservation. Terbaru, ia menjadi anggota dewan editor dari journal of Climate Resilience and Sustainability dari Royal Meteorological Society, Inggris. Ia menerima berbagai penghargaan dari beragam lembaga dan universitas:

1. Tahun 1993 terpilih sebagai peneliti senior terbaik di Universitas Indonesia.



2. Tahun 1999 menerima penghargaan bergengsi dari Yang Mulia Pangeran Bernhard dari Belanda, The Most Excellent Order of the Golden Ark, atas dedikasinya dalam kerja-kerja lingkungan.
3. Tahun 2009 menerima Habibie Award, atau Penghargaan Presiden B.J. Habibie, atas prestasi luar biasa dalam penelitian ilmu pengetahuan alam.
4. Tahun 2010 menerima Terry MacManus Award dari Amerika Serikat atas dedikasinya dalam meningkatkan kesadaran dan aksi lingkungan untuk konservasi alam.
5. Tahun 2011 menerima Penghargaan Achmad Bakrie di bidang Sains atas komitmennya memajukan biologi konservasi di Indonesia.
6. Tahun 2017 menerima Lifetime Achievement in the Field of Biodiversity Conservation dari Conservation International, Washington, D.C., USA.
7. Tahun 2023 menerima Margot Marsh Biodiversity Foundation Award for Excellence in Conservation, Amerika Serikat.
8. Tahun 2023 menerima Bosscha Medal for Environmental Conservation dari Konsorsium Universitas Leiden, Delft, dan Erasmus di Belanda.
9. Tahun 2025 menerima Lifetime Achievement dari Universitas Indonesia.
10. Tahun 2025 menerima Lifetime Achievement dari Sekolah Ilmu Lingkungan, Universitas Indonesia.

Hasil penelitian anggota World Conservation Union – IUCN SSC – Primate Specialist Group mengabadikan namanya dalam penamaan spesies baru tarsius dari Gorontalo, Sulawesi Utara, yaitu *Tarsius supriatnai*. Namanya juga diabadikan dalam spesies tokek terbang dari Kepulauan Togean, Sulawesi Tengah, *Draco supriatnai*. Peneliti Indonesia juga menemukan spesies tokek baru, yaitu tokek Bali (*Cyrtodactylus jatnai*), saat survei di Taman Nasional Bali Barat. Dalam sebuah editorial di New York Times dan



dalam buku “Hot, Flat, and Crowded” karya Thomas L. Friedman—jurnalis New York Times peraih Hadiah Pulitzer dan penulis buku laris dunia—ia digambarkan sebagai “The Noah of Modern History”. Conservation International menyebutnya “Conservation Warrior”.

Education:

- 1991. Ph.D. Biological Anthropology, The University of New Mexico, Albuquerque, New Mexico, USA.
- 1986. M.Sc. Biological Anthropology, The University of New Mexico, Albuquerque, New Mexico, USA. Indonesia.
- 1979. Drs. Fakultas Biologi, Universitas Nasional, Jakarta

Training:

- 2012 Senior Leadership and Management Training (10 months) at the Sloan School of Management, Massachusetts Institute of Technology (MIT), USA
- 2012 Understanding of China Economy and Management, Tsing Hua University, China (Executive training 2 weeks)
- 2004-2008 Received yearly Project management and Fundraising training at Conservation International, Washington DC. (each 2 weeks)
- 1999 Training and Seminar on Biodiversity Conservation at East-West Center, University of Hawaii, USA. (1 week)
- 1990-1991 and 1993-1994. Pre-and Post-Doctoral Research at CERC (Center for Environmental Research on Conservation) Columbia University, New York.
- 1999 Environment Leader training (CERC-Columbia University, New York), USA (1 week).
- 1981 Environmental Science and Management (BIOTROP) (2 weeks)



Post-Doctoral Fellowship:

- 1991-1992 Center for Environmental Research and Conservation (CERC), Columbia University, New York

Awards:

- 2025. Lifetime Achievement from the University of Indonesia.
- 2025 Lifetime Achievement from the School of Environment, Universitas Indonesia.
- 2025. Dosen Berprestasi International, Fakultas Matematika dan Ilmu Pengetahuan Indonesia, Universitas Indonesia
- 2023 Bosscha Medal for Environmental Conservation from Consortium Leiden, Delft, and Erasmus Universities of the Netherlands
- 2023 Margot Mash Biodiversity Foundation Awards for Excellence in Conservation, USA.
- 2017 Lifetime Achievement from Conservation International for Biodiversity Conservation, USA.
- 2011 Achmad Bakrie Award on Science from Freedom Institute, Jakarta (Indonesia)
- 2010 Terry MacManus Award from Conservation International, Washington DC., USA.
- 2009 President B.J. Habibie or "Habibie Award " for Natural Science (Indonesia)
- 2002 Award for the Best Senior Researcher at the University of Indonesia
- 2001 Orangutan Foundation International Awards for Achievement in Conservation Activities, USA.
- 1999 Netherlands Golden Ark Award for Nature Conservation. Prince Bernhard of the Netherlands.
- 1997 Second Prize Award for Scientific Publication on Natural Science of the University of Indonesia.
- 1996 Second-best lecturer prize of the University of Indonesia



- 1991 First Prize award for Scientific Publication on Natural Science of the University of Indonesia.

Professional Experience:

- In 2018-2025. He was elected to Chair the Association of Indonesian Environmental Scholars (PERWAKU)

Non-Management Board Members

- 2013-now. Chairman of the UN SDSN (United Nations Sustainable Development Solutions Network) for the Indonesia Office.
- 2013 Co-Chair of SDSN Southeast Asia.
- 2009- 2015 Chairman, Oversight Committee of Sumatra Conservation Trust Fund-TFCA (\$30 Million Trust Fund)
- Chairman, 1995-2005. Consortium for Gunung Gede-Pangrango and G. Halimun National Parks Development.
- Scientific Chairman, 1993-1999. Indonesian Wildlife Society.

Association Organization:

- 2014-2019 Board of Trustees (MWA) at the Universitas Indonesia
- 2010-2024. Advisory boards of various organizations, including Konservasi Indonesia Foundation, Tapanuli Orangutan Foundation, The Bornean Orangutan Society Foundation, The Conversation Indonesia Foundation (TCID), the United in Diversity (UID) Foundation, the Belantara Foundation, the CSF Foundation
- 2019 Board of the National University of Singapore-Centre for Nature-Based Climate Solutions
- 2011. IUCN Co-chairman of the Southeast Asia Primate Specialist Group.



Editorial board:

- 2019-present, Associate Editor, Asian Journal of Biodiversity (Taprobanica)
- 2021-2022, Associate Editor, Journal of Climate Resilience and Sustainability from the Royal Meteorological Society, UK.
- 2011-2015. Editorial board member of IUCN-World Protected Area, Parks: The International Journal of Protected Area and Conservation
- 2008- present, Co-Editor, Asian Primate Journal, SSC-IUCN Regional Journal (based in Bangkok)
- 2007-present, Board of Editors, Tropical Conservation Science Journal (based in US)
- Editorial Board, 1998-2010. Biosphere Conservation (International Journal based in Japan)
- Consulting editor, 1998-2010. International Journal of Wildlife Research and Policy (based in US)
- Consulting editor, 1997-2000. Biodiversitas Indonesia (Journal)
- Chief editor 1992- 2005. Tropical Biodiversity (an international Journal), Published by IFABS

Advisory Council and Expert Team

- 2024. Chairman of the Board, Yayasan Konservasi Indonesia
- 2024 Member, Advisory Council, Conservation Sustainable Finance Foundation 2021. Chairman of the Board, Ecology Foundation, Kepulauan Riau Province 2014 Member of Indonesia Climate Change Trust Fund, BAPPENAS
- 2012 Chairman, TFCA Sumatra Trust Fund, USAID, CI, KEHATI-GOI 2011 Chairman, Advisory Council of Yayasan Konservasi Indonesia 2002 Member of Advisory Council, The Earthwatch Institute, Australia



- 1999 Member of the Advisory Council of Bornean Orangutan Society Foundation 1998 Member of the Board of YCCLI Foundation
- 1998 Member of the Board of Indecon Foundation
- 1991 Member of the Board of the Foundation for Advancement of Biological Sciences

Memberships of International and Professional organizations:

- IUCN (CNPPA-Commission on National Park and Protected Areas)
- IUCN (SSC-CBSG-Captive Breeding Specialist Group)
- IUCN (SSC-PSG-Primate Specialist Group)
- Society for Conservation Biology
- International Primatological Society (Conservation Committee representing Southeast Asia Region)
- American Society of Primatologists
- Indonesian Society of Biologists (Chairman for Jakarta chapter)
- Indonesian Wildlife Society (Research and Development, chairman)

Assignments by the Indonesian Government

- 2022-2023. Assisted in developing regulations on the Economics of Carbon, Min Coord Maritime Affairs 2021-2023. Member of the Experts on Sediment Utilization, Ministry of Marine and Fisheries.
- 2019-Present. Member of Experts for SDGs, Ministry of Planning/BAPPENAS
- 2013- Present. Board member of Indonesia Climate Change Trust Fund, Ministry of Planning, BAPPENAS, Indonesia
- 2004-2006. Member of the Working Group on Reviewing Logging Concession under the Ministry of Forestry.



- 2001- 2004. Chairman of the Government Working Group on Biodiversity at the Ministry of Research and Technology
- 1998-1999 Member of Government Working Group, Access to Genetic Resources, Min. of Environment
- 1996-1998 Member of the Orangutan Commission at the Min. of Forestry

Outreach and Publications

- Professor in the field of Conservation Biology at the Department of Biology FMIPA Universitas Indonesia.
- Until 2022, promoters of more than 50 Master's and Doctoral programs at the Dept. of Biology FMIPA and the School of Environmental Sciences, all at the Universitas Indonesia. Three dissertations related to Sustainable Agriculture: Life cycle Assessment on Coffee, Life cycle on Palm Oil in the peatland Area, and understanding Sago Plantation sustainability, Emission reduction, Carbon Capture Storage, etc.
- Over 230 scientific articles in various international reputable journals such as Science, Nature, PNAS, American Naturalist, Scientific Reports, Nature Human Behavior, Current Biology, Conservation Biology, Conservation Letters, Global Ecology and Conservation, Sustainability, Discover Sustainability, and others.
- More than thirty books on Environment and Conservation. 2 books related to Sustainability products: Sustainable Environmental Management: Lessons from Indonesia, Wildlife Tourism, National Parks of Indonesia, etc.
- His Google Scholar H-index is 47, i-10 index is 120, and Scopus H-index is 33. Citations are 8295.

Outreach and Publications

- The research results by World Conservation Union-IUCN SSC-Primate Specialist Group members immortalized his name for a new tarsier primate species from



Gorontalo, North Sulawesi, Tarsius supriatnai.

- His name is also enshrined in the species name of the flying gecko from the Togean Islands, Central Sulawesi, with the name *Draco supriatnai*.
- Indonesian researchers, during a survey in the West Bali National Park, a new type of gecko was found called the Bali Gecko (*Cyrtodactylus jatnai*).
- In an editorial opinion of the New York Times newspaper and in a book entitled *Hot, Flat, and Crowded* by Thomas L. Friedman, the very well-known bestseller and Pulitzer Prize-winning journalist of the New York Times described him as “The Noah of Modern History,” and Conservation International refers to him as a “Conservation Warrior.”

Management experience:

- 2021 – now Executive Director of Indonesian Science Fund, Indonesian Academy of Sciences.
- 2015-2020. Chairman of the Institute for Sustainable Earth and Resources (I-SER), Universitas Indonesia
- 2011- 2015. CEO and President (2014), United in Diversity Foundation, Indonesia.
- 2010-2015 Chairman, Research Center for Climate Change, University of Indonesia
- 1994-2010, Executive Director and Regional Vice President, Conservation International-Indonesia Program.

A. Books

1. **Supriatna, J.** 2025. *Wildlife Ecotourism in Indonesia*. Yayasan Obor, Jakarta.
2. **Supriatna, J.** and R. Lenz 2025. *Sustainable Environment Management: Lessons from Indonesia*. Springer, Switzerland.
3. **Supriatna, J.** and Margules, C. 2025. *The National Parks of Indonesia*. Springer, Switzerland.



4. **Supriatna, J.**, Margules, C. Amarasinghe, A.A.T., Jarvis, T. (Editors) 2025. Proceeding of the first International Symposium on Biodiversity Conservation and Ecotourism. Yogyakarta, Taprobanica 13 (Supplementary Issue): i-ii+1-198pp.
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7. **Supriatna, J** (Ed) 2023. Biologi Terapan untuk Masa Depan dan Kemajuan Bangsa. Pustaka Obor, Jakarta. 456p.
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9. Gursky, S.L., **J. Supriatna**, A. Achorn (editors) 2022. Ecotourism and Indonesia's Primates. Springer, Switserland
10. **Supriatna, J.** and Ralph Lenz. 2022. Sustainable Environmental Management. Yayasan Obor, Jakarta. 634p., Foreward: Vice Minister of Env and Forestry Dr. Alue Dohong and Prof Emil Salim.
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12. **Supriatna, J.** 2021. Otobiografi Jatna Supriatna: Jejak Selur Seorang Petualang, Pendidik dan Wiraswasta Kehidupan. Pustaka Obor, Jakarta, 448p.
13. **Supriatna, J.** 2021. (editor). Pelestarian Keanekaragaman Hayati di Indonesia: Metode dan Analysis (Conserving Biodiversity in Indonesia: Method and Analysis). Pustaka Obor, Jakarta., 621p.
14. **Supriatna, J.** 2021 (Editor). Metode dan Analysis Method and Analysis for Bionatural Products and Environment. Pustaka Obor, Jakarta, 676p



15. **Supriatna, J.** 2019. Field Guide to the Primates of Indonesia. Pustaka Obor, Jakarta, 233p.
16. Jompa, J., A.F. Koropitan, B. Juliandi, L. Suryanegara, R. Muhamad, S. Mumbunan, S. Nasir, T.Y. Sukarna, V. Narita, BM. Suyitno, **J. Supriatna** and S. Marzuki. 2019. Science for Indonesia Biodiversity., AIPI, Jakarta, 228p.
17. **Supriatna, J.** 2018. Konservasi Biodiversitas Indonesia: Teori dan Praktek di Indonesia (Conserving Biodiversity in Indonesia: Theory and Practice). Pustaka Obor, Jakarta, 451 hal/p.
18. Mustaqin,W., N. Fajri, S.J. Sindhuarta, **J. Supriatna**, D. Hartiningtias, D. Muliasari 2017. Panduan Lapangan Flora: Spematofita Taman Hutan Raya Pancoran Mas, Depok, Jawa Barat. Pusat Riset Perubahan Iklim, Universitas Indonesia.230 hal/p..
19. **Supriatna, J.** and R. Ramadhan 2016. Berwisata Primata di Indonesia (Primate Tourism in Indonesia). Penerbit Pustaka Obor, Jakarta.
20. **Supriatna, J.** A.A. T. Amarasinghe & C. Margules 2015. Proceeding of the Second International Conference on Alfred Wallace and the Wallacea. Taprobanica and Research Center for Climate Change, Universitas Indonesia, Jakarta 212p.
21. **Supriatna, J.** 2014. Berwisata di Taman Nasional (Tourism in the National park). Yayasan Obor, Jakarta.
22. Gursky-Doyen, S and **J. Supriatna** 2010. Indonesia Primates. Springer, New York.
23. Mittermeier, R. J.Wallis, A.B. Rylands, J.U. Ganzhorn, J.F. Oates, E.A. Williamson, E. Palacios, E. W. Heyman, M.C. Kierulff, L. Yongseng, **J. Supriatna**, C. Roos, S. Walker, L. Cortez-Ortiz and C. Schwitzer, 2009. Primates in Peril: The World Most Endangered Primates 2008-2010. IUCN, 84p.
24. **Supriatna, J.** 2008. Melestarikan Alam Indonesia (Saving of Indonesia's Nature). Yayasan Obor, Indonesia, 482p.



25. Indrawan, M. R. Primack and **J. Supriatna** 2008. Biologi Konservasi (Conservation Biology). Yayasan Obor, 502 p.
26. **Supriatna, J.**, J. Manansang, L. Tumbelaka, N. Andayani, M. Indrawan, L. Darmawan, S.M. Leksono, Djuwantoko, U. Seal and O. Byers 2001. Conservation assessment and Management Plan for Indonesia Primates: Final Report. Conservation Breeding Specialist Group (SSC/ IUCN), Apple Valley, Minesota, USA. 251 p.
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30. Van Schaik, C. and **J. Supriatna** 1996. The Gunung Leuseur National Park. Yayasan Bina Sains Hayati Indonesia, Jakarta, 354p.
31. Stone, D., Cochrane, J., C. Halls, D. Harahap, S. Riswan, F. Salim and **J. Supriatna** 1994. Tanah Air: Indonesia's Biodiversity. Archipelago Press, Singapore, 395p
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33. Hadie, W. and J. Supriatna 1989. Pengembangan udang air tawar dalam hatchery (Shrimp culture and Hatchery). Yayasan Kanisius, Yogyakarta, 89p
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B. Scientific Articles and papers (an edited book)

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2. Hadi, A.N., Siregar, Y, anugrah, N., Kuswanda, Manalu, J,H.B., Nasution, N., Fauzan, R. Wardani, N, Subhan, Barata, U., Eahman, D.A., Ishhadamy, Y. Sitorus, S.F., Andayani, N., **Supriatna, J.**, Wich, S., Kuhl, H.S nd Buckley,B.J.W. 2026.Population status of Sumatran and Tapanuli orangutans: A comprehensive assessment 2021–2023. Global Ecology and Conservation 69 (2026) e04302
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4. Medham, D., S., Langston, J.D., Resosudarmo, I., A., O.P., **Supriatna, J.**, Abdurrahin, A.Y. and O'Grady, A.,O. 2026. Strengthen the Tropical Forest Forever Facility to safe guard forest and people. Nature Ecology and Evolution. <https://doi.org/10.1038/s41559-26-03051-z>.
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6. Putra, M.I.H., Wirasatriya, A., Asyraffauzan, H., Fahmi, Syakurachman, I., Hasan, A., Prasetyo, H., Sianipar, A., Setyawan, E., Prabowo, P., Wattiheluw, M.S., Handoyo, A.E., Kurniawan, M.F.A., Erdmann, M.V., **Supriatna, J.**, Manessa, M.D.M. 2025. Spatio-temporal patterns, trends, and oceanographic drivers of whale shark strandings in Indonesia. *Scientific Reports* 15:36435.
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10. Anirudh, N.M., Van Veem, F.J.F., Ripoll-Capilla, B., Buckley B.J.W., Erb, W.M., Niun, M.A., Maimunah, S., Makur, K.P., Armadiyanto, Estrada, E., Boyd, M.S., Cheyne, S.M., santioano, Namaskari, M., Husson, S.J., Randi, A., Seaman, D.J.I., Deere, N.J., **Supriatna, J.**, Struibig, M.J., Harisson, M.E. 2025. Lowland heath forests of Indonesian Borneo; ecological value and conservation challenges. *Journal of Tropical Ecology* 41: e19.
11. Rimbono, R., **Supriatna, J.**, Koestoer, R.H. Hamzah, U.S. 2025. Bridging the Gap: Multistakeholder Perspectives on the Role of Carbon Capture and Storage (CCS)/Carbon Capture Utilization and Storage (CCUS) in Achieving Indonesia's Net Zero Emissions. *Sustainability* 17,5935. <https://doi.org/10.3390/su17135935>.
12. Rimbono, R., **Supriatna, J.**, Koestoer, R.H., Hamzah, U.S. 2025. Economic Viability and Policy Imperative of Carbon Capture Utilization and Storage in Indonesia's Pathway to Net-Zero Emissions. *Challenges in Sustainability* 13(2): 236-253.



13. Aninta, S.G. Drinkwater,R., Carmagrini,A., Deere,N.J., Priyono, D.S., Andayani,N., Winarni,N., **Supriatna,J.**, Fumagalli, M., Larson,G., Galbusera,P.H., MacDonald,A., Greer,D., Mohamad,K., Prasetyaningtyas,W.E., Mustari,A.H., Williams, J.L., Barnett,R., Shaw,D., Semidai,G., Burton, Seaman, D.J., Voight,M., Struibig M.J., Brace, S., Rossiter, S.J., and Frantz, L. 2025. The important of small-island populations for the long-term survival of endangered large-bodied insular mammals. PNAS 122 (26): e2422690122.
14. Lieb, Z.E., Meijards, E., Brodie, F.I, Sabharini, A., Azlan, **Supriatna, J.** Struibig M.J. 2025. Mapping Multiple Wild Pig Species' Population Dynamics in Southeast Asia During the African Swine Fever Outbreak. Conservation Letters18:e13105.doi.org/10.1111/conl.13105.
15. Prayitno, K., Saputra, A.W., Ibbet, H. Dorward, L., Trywidiarini, T. Dwiyanreni,A.A., **Supriatna,J.** Freya,A.V.St. 2025. Understanding Local People's Deforestation Decision in Gunung Leuser National Park, Indonesia. Society and Natural Resources. Doi.org/1-.1080/08941920.2025.2509302.
16. Iskandar, B.S., Iskandar, J., Mulyanto, D., **Supriatna, J.** 2025. Ethnozoological knowledge of diversity, folk taxonomy, and animal hunting among the Baduy in Banten, Indonesia. BIODIVERSITAS 25 (12): 5031-5045.
17. Lo, M.G.Y., Morgans, C.L., Santika, T., Mumbunan, S., Winarni, N., **Supriatna, J.**, Voight, M., Davis, Z.G. Struebig,M.J. 2024. Nickel mining reduced forest cover in Indonesia but had mixed outcomes for well-being. One Earth 7: 2019-2033.
18. Anirudh, N.B., N.J. Deere, E. Estrada, R. Hidayat, M.J. Struebig, **J. Supriatna.** 2024. Mammals of the Rungan-Kahayan Landscape, Central Kalimantan, Indonesia. *Taprobanica* 13 (2); 101-115.
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- sumatrana) in South Sumatra. *Taprobanica*13 (02): 144-145.
20. Engert, J.E., Mason J Campbell, Joshua E Cinner, Yoko Ishida, Sean Sloan, **Jatna Supriatna**, Mohammed Alamgir, Jaime Cislowski, William F Laurance 2024. Ghost roads and the destruction of Asia-Pacific tropical forests. *Nature* 629: pages370–375
 21. Novarina,D., **Supriatna, J.**, Santoso, I., Karuniasa,M. 2024. Peatland Transformation: Land Cover Changes and Driving Factors in the Kampar Peninsula (1990-2020). *Land* 13: 1699. doi.org./10.3390/land13101699.
 22. Dorward, Leejiah, Harriet Ibbett, Asri A. Dwiyahreni, Edward Kohi, Karlina Prayitno, Stephen Sanken, Joseph Kaduma, Rose Mawenya, Jesca Mchomvu, Humairah Sabiladiyni, Andie Wijaya Saputra, **Jatna Supriatna**, Tyassanti Trywidiarini, and Freya A. V. St John.2024. Cross-Cultural Applications of the New ecological Paradigms in the protected area contexts. *Environment and Behavior* 1–32
 23. Ardiantoto, Irene M.R. Pinondang, Desy S. Chandradewi, Gono Semiadi, Freddy Pattiselano, **Jatna Supriatna**, Johny S. Tasirin, Nurul L. Winarni, Maria Voigt, Joseph W. Bull, Tatyana Humle, Nicholas J. Deere, and Matthew J. Struibig 2024. Insights from 20 years of mammal population research in Indonesia. *Oryx*. Published online 2024:1-8. doi:10.1017/S0030605323001539.
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C. SCIENTIFIC WORKS-PAPERS READS IN Workshop/Conference

1. **Supriatna,J.** 2024. Center for Excellence in Conservation and Green Economy of Net Zero Initiative-Universitas Indonesia. UNFCC COP29, Baku, Azerbaijan, in the Indonesia Pavilion, 16 November.
2. Anirudh N.B., Deere N.J., **Supriatna, J.**, Struebig, M.J. 2024. *Population trends of terrestrial mammals in community forests of Indonesian Borneo Presented at the European Conference on Conservation Biology (ECCB), Bologna, Italy.*



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7. **Supriatna, J.** 2015. Gradute Program on Climate Change and Disaster Management. Presentation at Climate Change Science Seminar, Indonesia Pavilion, UNFCCC, Paris.
8. **Supriatna, J.** 2014. Wildlife Tourism in Indonesia: Problems and Progress. (Key Note Speaker), 3rd Australian Wildlife Tourism Conference, Geelong, Australia, Sept 28-Oct 3, 2015.
9. **Supriatna, J.** 2014. Biodiversity Conservation in Indonesia Needs Partnership between the Public Sectors, Scientists and the Private Sectors. (Key Note Speaker). Association of Tropical Biologist Meeting (ATBC), Cairns, Australia, 20-24 July. 2014
10. **Supriatna, J.** 2014. Sustainable Development Solution Network Indonesia: Progress Report. SDSN meeting in Kuala Lumpur
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56. Kawamoto, Y., K. Nozawa, Tb.M. Ischak, **J. Supriatna**, B. Suryobroto, P. Varavudhi 1990. Evolution and Genetic Differentiation of the Crab-Eating Macaque. XIIIth Congress of the International primatological Society, Nagoya-Kyoto, Japan.
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D. Newspapers and Popular Journals.

1. Michaela Guo Ying Lo, **Jatna Supriatna**, M. Struibig. Weighing the green cost: How nickel mining in Indonesia impacts forests and local communities. The Conversation, January 16, 2025
2. Michaela Guo Ying Lo, **Jatna Supriatna** and Mathew Struibig. 2025. Sisi gelap transisi energi: Bagaimana penambangan nikel berdampak pada hutan dan masyarakat Sulawesi. The conversation, Januari 28, 2025
3. **Supriatna, J.** 2025. Program 'food estate' yang harmonis dengan lingkungan dan masyarakat adat: bagaimana caranya? The Conversation, Januari 9, 2025
4. **Supriatna, J.** 2023. Dari kodok hingga komodo: bagaimana El Nino berdampak buruk bagi satwa liar, November 2, 2023 1.51am GMT. The Conversation.com, Indonesia
5. **Supriatna, J.** 2023. 200 tahun Alfred Wallace: laboratorium hidup evolusi Wallacea semakin disesaki pembangunan. The Conversation.com. Published: August 10, 2023 5.34am BST Updated: August 10, 2023 8.11am BST
6. **Supriatna, J.** 2022. Wallacea is a living laboratory of Earth's evolution – and its wildlife, forests and reefs will be devastated unless we all act. Published: August 11, 2023 3.53am CEST, The Conversation.com, Indonesia



7. **Supriatna, J.** 2021. Why we must reassess the komodo dragon's endangered status. The Conversation.com, Indonesia, Sept 27.
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12. **Supriatna, J.** 2012. Air dan Program Ekonomi Hijau PBB. Sinar Harapan 1 Juni
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Pemberi Kuliah Umum
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GONO SEMIADI



KONSERVASI KEANEKARAGAMAN HAYATI: PENDEKATAN DI ERA GLOBALISASI

GONO SEMIADI

PUSAT RISET BIOSISTEMATIKA & EVOLUSI - BRIN

Konservasi keanekaragaman hayati (kehati) tidak hanya berkaitan dengan perlindungan spesies dan ekosistem, tetapi juga dengan kemampuan bangsa dalam menjaga ketahanan pangan, air, kesehatan, iklim, budaya, serta kedaulatan dalam pengelolaan sumber daya hayati. Pengelolaan keanekaragaman hayati harus ditempatkan dalam kerangka pembangunan nasional, ilmu pengetahuan, dan keberlanjutan, terutama ketika dunia menghadapi dinamika global yang semakin kompleks.

Keanekaragaman hayati Indonesia memiliki posisi yang sangat penting dalam konteks global. Sebagai negara kepulauan dengan kekayaan ekosistem yang tinggi, Indonesia memiliki hutan tropis yang luas, terumbu karang dalam kawasan segitiga koral dunia, ribuan spesies tumbuhan, dan fauna dengan tingkat endemisitas tinggi, serta ekosistem mangrove, padang lamun, dan rawa gambut yang bernilai ekologis besar. Namun, kekayaan tersebut berhadapan dengan tekanan internal dan eksternal negara yang terus meningkat, berupa degradasi dan fragmentasi habitat, eksploitasi berlebih terhadap sumberdaya kehati, polusi, spesies invasif, perubahan iklim, serta keterbatasan data dasar biodiversitas yang memadai dan terbarukan. Kondisi tersebut menuntut tata kelola kehati yang berbasis data, ilmu pengetahuan, dan perencanaan jangka panjang.

Dalam era globalisasi, Indonesia tidak hanya menjadi pendukung agenda konservasi global, tetapi juga berperan aktif dalam menentukan arah tata kelola kehati dunia. Keterlibatan Indonesia dalam berbagai forum internasional,



termasuk Convention on Biological Diversity (CBD), menunjukkan posisi strategis Indonesia dalam percaturan global biodiversitas. Berbagai instrumen internasional seperti CBD, Protokol Nagoya, Protokol Cartagena, IUCN, CITES, BBNJ, dan IPBES memberikan kerangka normatif serta ilmiah bagi negara-negara dalam mengelola konservasi, pemanfaatan berkelanjutan, perdagangan spesies liar, sumber daya genetik, dan hubungan antara sains dengan kebijakan. Bagi Indonesia, keterlibatan aktif dalam forum tersebut menjadi penting untuk memastikan kepentingan nasional tetap terwakili dalam keseimbangan tata kelola biodiversitas global.

Komitmen global kehati diterjemahkan ke dalam arsitektur kebijakan nasional melalui RPJPN 2025–2045, RPJMN 2025–2029, dan *Indonesia Biodiversity Strategy and Action Plan* (IBSAP) 2025–2045. RPJPN memberikan arah pembangunan jangka panjang, RPJMN menerjemahkan agenda tersebut dalam program lima tahunan, sedangkan IBSAP menjadi kompas nasional biodiversitas yang mengintegrasikan target kehati global Kunming–Montreal Global Biodiversity Framework (KMGBF) CBD ke dalam strategi dan aksi nasional. IBSAP 2025–2045 memuat tiga tujuan, 13 strategi, 20 target nasional, dan 95 kelompok aksi, sehingga menjadi instrumen operasional yang dapat digunakan untuk mengarahkan program, anggaran, indikator, dan evaluasi lintas lembaga.

Implementasi konservasi juga membutuhkan keterhubungan antara kebijakan nasional dan kebijakan sektoral. Strategi dan Rencana Aksi Konservasi (SRAK) spesies di sektor kehutanan serta Rencana Aksi Nasional (RAN) di sektor kelautan dan perikanan harus dipandang sebagai bagian dari satu kesatuan ekologis antara darat dan laut. Keberhasilan konservasi hanya dapat dicapai apabila terdapat kesinambungan dari komitmen internasional, kebijakan nasional, instrumen sektoral, hingga aksi di tingkat tapak yang melibatkan pemerintah daerah, masyarakat adat, masyarakat lokal, lembaga riset, perguruan tinggi, swasta, dan organisasi masyarakat sipil.



IBSAP juga menjadi landasan penting dalam menentukan kebutuhan penelitian nasional. Target-target biodiversitas nasional tidak hanya merupakan target pengelolaan, tetapi juga menjadi sumber inspirasi penelitian dan arah pengembangan ilmu pengetahuan. Kebutuhan riset mencakup inventarisasi spesies dan ekosistem, DNA barcoding, environmental DNA (eDNA), whole genome sequencing (WGS), genomik konservasi, pemantauan populasi, pengendalian spesies asing invasif, restorasi ekosistem, konektivitas habitat, karbon biru, adaptasi berbasis ekosistem, konflik manusia-satwa, zoonosis, perdagangan ilegal, biosafety, dan risiko bioteknologi. Data hasil penelitian tersebut menjadi fondasi bagi pelaporan nasional kepada CBD melalui National Report, termasuk evaluasi capaian target biodiversitas Indonesia.

Perkembangan teknologi telah mengubah paradigma konservasi dari perlindungan material biologis menuju tata kelola informasi dan inovasi berbasis hayati digital. *Digital Sequence Information* (DSI) dan *Synthetic Biology* (Synbio) menjadi isu strategis yang kini memengaruhi arah politik biodiversitas global. Konservasi tidak lagi hanya berbicara tentang spesimen fisik, tetapi juga mencakup data genomik, database, algoritma, kecerdasan buatan, pemodelan prediktif yang menjadi produk turunan seperti obat, bahan aktif, dan teknologi sintetis. Dalam konteks global, seluruh proses tersebut berkaitan dengan mekanisme benefit-sharing melalui Cali Fund dan *Access and Benefit Sharing* dalam kerangka Nagoya Protocol. Lemahnya pemahaman terhadap perkembangan tata kelola global ini dapat menyebabkan Indonesia tertinggal dalam menentukan posisi dan kepentingannya dalam politik biodiversitas dunia. Oleh karena itu, diperlukan kebijakan adaptif yang mampu melindungi kepentingan nasional, menjamin pemanfaatan yang adil dengan pihak luar, sekaligus membuka ruang bagi kreativitas dan inovasi ilmuwan nasional melalui berbagai peraturan yang bersahabat. Pendekatan lintas sektor yang menghubungkan biodiversitas, kesehatan, bioteknologi, hukum, dan diplomasi menjadi kebutuhan penting. BRIN memiliki peran strategis dalam memimpin pengembangan



kapasitas *new emerging science and technology* sebagaimana amanah IBSAP dan kapasitasnya sebagai Otoritas Ilmiah (*Scientific Authority*).

Penguatan konservasi modern sangat bergantung pada penguasaan data. Baseline data menjadi fondasi utama karena tanpa informasi mengenai apa yang dimiliki, dimana, bagaimana kondisi populasi, dan tren perubahan, suatu keberhasilan konservasi tidak dapat diukur secara objektif. Tantangan utama Indonesia adalah keterbatasan data dasar yang masih tersebar dan belum sepenuhnya mewakili kondisi lapang dan terintegrasi. Data biodiversitas harus distandarkan dan dihubungkan lintas lembaga serta lintas negara agar dapat dibandingkan antarwilayah dan antarwaktu. Eksplorasi ilmiah dan ekspedisi biodiversitas menjadi bagian penting dalam membangun fondasi pengetahuan tersebut. Konservasi masa depan harus berbasis sistem pengetahuan yang menghubungkan data, sains, dan pengambilan keputusan yang terukur.

Perubahan paradigma konservasi juga membutuhkan perubahan profil sumber daya manusia. Konservasi modern memerlukan tim lintas disiplin yang menguasai genomik, bioinformatika, synthetic biology, Digital Sequence Information, etika data, hukum internasional, serta tata kelola global biodiversitas. Namun, perkembangan teknologi tidak boleh menghilangkan fondasi ilmu dasar seperti taksonomi, identifikasi spesies, dan ekologi. Penguatan pendidikan tinggi perlu diarahkan untuk mencetak generasi yang mampu menghubungkan sains dasar dengan teknologi baru dan implementasi kebijakan. Konservasi masa kini membutuhkan ilmuwan yang memahami perjalanan dari spesimen biologis hingga pemanfaatan informasi genetik digital.

Untuk penguatan BRIN sebagai *scientific authority* keanekaragaman hayati nasional, diperlukan dukungan kelembagaan yang kuat agar bukti ilmiah dan arah riset kebijakan nasional dapat dibangun, dimanfaatkan, dan memberikan dampak nyata. Peneliti merupakan fondasi utama lembaga riset. Birokrat dan administrasi memiliki peran penting sebagai pendukung dan penopang, tetapi



tidak dapat menggantikan fungsi ilmuwan. Ekosistem riset yang sehat harus menempatkan peneliti sebagai fondasi, lembaga sebagai kolom bangunan, dan administrasi sebagai balok penyangga yang memperlancar proses ilmiah. Bukan sebagai bangunan yang terbalik. Beban birokrasi dan administratif yang berlebihan selama ini berpotensi menghambat implementasi hasil riset, bahkan menyebabkan proposal yang telah lolos seleksi tidak mencapai tujuan secara optimal. Fragmentasi kelembagaan dan sekat institusional perlu dikurangi karena dapat melemahkan kualitas penelitian yang transdisiplin dan konsep kebijakan. BRIN membutuhkan ekosistem riset yang lebih terintegrasi, kolaboratif, dan berorientasi pada kepentingan ilmuwan dan nasional agar mampu menjalankan peran sebagai *scientific authority* kehati Indonesia yang lebih optimal dalam menghadapi tantangan kebijakan global (GS).



IBSAP 2025-2045



National Report 7



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CURRICULUM VITAE

GONO SEMIADI

Perjalanan ilmiah Prof. Dr. Gono Semiadi yang lahir di Beirut (Lebanon) 65 tahun lalu, dari keluarga diplomat, tumbuh dari konsistensi menekuni dunia satwa liar, pengelolaan mamalia, konservasi biologi, pemantauan keanekaragaman hayati, pengelolaan ex-situ, hingga kebijakan biodiversitas. Pendidikan sarjana ditempuh di Fakultas Peternakan Universitas Brawijaya pada 1979-1985 melalui jalur “Beasiswa Pendidikan Jurusan Langka”. Pada tahun 1980 juga menjadi mahasiswa di IKIP Malang jurusan bisnis hingga tahun 1985. Langkah akademiknya kemudian berlanjut ke Texas A&M University, Kingsville, Amerika Serikat, melalui beasiswa Overseas Fellowship Program (OFP) BPPT saat itu, untuk meraih gelar master dalam bidang rangeland management pada tahun 1986 sampai 1989, dan ke Massey University, Selandia Baru, untuk menyelesaikan doktor dalam bidang wildlife management pada tahun 1989 hingga 1993 melalui beasiswa lanjutan OFP selama satu tahun dan dilanjutkan beasiswa dari pemerintah Selandia Baru untuk negara berkembang. Selepas pendidikan doktor, ia melanjutkan kegiatan pascadoktoral di AgResearch, Ministry of Agriculture New Zealand dan Massey University dari 1993 hingga 1996 dalam bidang “Emerging Prospect of Wild Animal for Meat Production” dengan fokus pada domestikasi rusa sambar di Selandia Baru sebagai bagian dari pengembangan industri peternakan rusa yang sedang booming di era itu.

Karier penelitian dimulai dari kedekatannya dengan alam sejak mahasiswa. Aktif dalam dunia organisasi Pecinta Alam dan dunia Konservasi Gua. Perjalanan dalam lorong kegelapan di dalam perut bumi gua, menuju dinginnya alam



di ketinggian gunung serta indahnya alam dari atas atap dunia melalui terjun payung, dilalui sebagai modal dasar dalam pemilihan jalan hidup sebagai seorang peneliti.

Karier sebagai peneliti dimulai langsung sejak lulus perguruan tinggi, ditempatkan di Pusat Penelitian dan Pengembangan Biologi LIPI mulai 1985, berpindah ke Pusat Penelitian Biologi LIPI, dan dilanjutkan ke Badan Riset dan Inovasi Nasional (BRIN) pada tahun 2022, dengan penempatan awal di Pusat Riset Ekologi & Etnobotani, kemudian ke Pusat Riset Zoologi Terapan, dan terakhir berlabuh di Pusat Penelitian Biosistemika dan Evolusi hingga kini. Dalam rentang panjang itu, penelitian tidak berhentidilaboratorium. Ia sempat memimpin Laboratorium Reproduksi Satwa, Puslit Biologi LIPI, terlibat membantu sebagai sub kurator kelompok mamalia besar di Museum Zoologicum Bogoriense LIPI, serta mengembangkan kajian pengelolaan satwa liar, reproduksi, domestikasi, konservasi spesies, dan pemanfaatan berkelanjutan. Perjalanan lapangan membawanya ke berbagai bentang alam Indonesia, termasuk mengoordinasikan Ekspedisi LENGGURU Papua, sebagai liaison officer pada project Global Species Management Plan (GSMP)-PKBSI, serta berbagai survei keanekaragaman hayati di kawasan hutan, karst, wilayah konsesi hutan, habitat satwa terancam dan Kawasan pertambangan di Jawa, Maluku, Sulawesi hingga Sabah-Malaysia,.

Memasuki fase karier berikutnya, pengalaman lapangan dan penelitian berkembang menjadi peran yang semakin kuat dalam menghubungkan antara sains dan kebijakan. Ia terlibat dalam penilaian status keterancaman berbagai satwa mamalia Bersama The International Union for Conservation of Nature (IUCN) Red List, membina pengelolaan populasi satwa di kawasan konservasi, melakukan penilaian pengelolaan kebun binatang, menulis dokumen tentang pengembangan strategi konservasi, serta melakukan berbagai kerja sama penelitian tingkat



nasional dan internasional. Sejak masa LIPI hingga BRIN, ia juga berperan aktif dalam penguatan scientific authority keanekaragaman hayati dengan menjadi Koordinator Indonesian Scientific Authority CITES di tahun 2018-2019 dan Manajer Kebijakan pada Sekretariat Kewenangan Ilmiah Keanekaragaman Hayati-BRIN (SKIKH) dari 2020 hingga 2025.

Jejak internasionalnya kemudian semakin menonjol dengan penempatan pada forum global Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) dibawah PBB, dengan menjadi coordinator National Focal Point Indonesia dari 2018-2025. Sejak 2025 hingga kini menjadi anggota Informal Advisory Group on Technical and Scientific Cooperation pada Convention on Biological Diversity (CBD) dibawah PBB, serta di tahun 2026 hingga kini juga menjadi anggota Multidisciplinary Expert Panel IPBES. Ia pernah menjadi National Focal Point untuk SBSTTA 2019-2025, Alternate Chair pada beberapa pleno SBSTTA CBD di Paris, Nairobi dan Bonn, serta anggota delegasi Indonesia pada beberapa COP CBD dan IPBES, selain sebagai Perwakilan Pemerintah pada G-20 Regional Meeting di India tahun 2023. Peran tersebut menempatkan pengalaman ilmiah Indonesia langsung di ruang dialog sains dengan kebijakan global.

Kontribusinya juga tercermin dalam penyusunan berbagai dokumen strategis nasional . Ia terlibat dalam penyusunan National Report Indonesia untuk CBD, menjadi bagian dari tim penyusun IBSAP 2025-2045 di Kementerian Lingkungan Hidup, berkontribusi pada penyusunan dokumen Status Keanekaragaman Hayati Indonesia di BAPENAS, serta pengembangan dokumen Strategi dan Rencana Aksi Konservasi (SRAK) spesies terrestrial di Kementerian Kehutanan, dan penentuan status perlindungan ikan di Kementerian Kelautan dan Perikanan.. Pada saat yang sama, kegiatan penelitian terus berkembang ke konservasi genetika, DNA profiling, stable isotope untuk



wildlife forensics, teknologi reproduksi, biodiversitas terapan, hingga penelitian mengenai dampak spesies feral terhadap biodiversitas Indonesia. Kiprah dalam dunia pendidikan adalah sebagai co-promotor program doctoral dan pembimbing program Magister di IPB, UGM dan UI.

Dalam karier penelitiannya selama 40 tahun, ia telah terlibat dalam penerbitan tiga karya buku internasional tentang Rusa, Trenggiling dan Babi, dan lima karya buku nasional, 69 karya tulis ilmiah global, dan 37 karya tulis ilmiah nasional. Salah satu *Masterpiece* dari kolaborasi publikasi karya ilmiahnya adalah satu teori dalam perhitungan modeling spasial yang hingga saat ini masih menjadi rujukan sejak pertama kali terbit di tahun 2013 dan telah disitasi sebanyak 1565 kali. Kini, sebagai peneliti di Pusat Riset Biosistematika dan Evolusi BRIN, perjalanan itu memperlihatkan satu garis yang konsisten: dari memahami satwa di lapangan, membangun bukti melalui penelitian, mengembangkan metode dan jejaring, hingga membawa sains ke ruang kebijakan nasional dan global. Sebuah perjalanan panjang yang menegaskan bahwa konservasi keanekaragaman hayati membutuhkan ketekunan ilmiah, keberanian bekerja lintas disiplin, serta kemampuan menghubungkan pengetahuan dengan keputusan yang menentukan masa depan biodiversitas Indonesia.



CURRICULUM VITAE

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google.com/citations?user=Lx5acxMAAAAJ&hl=en](https://scholar.google.com/citations?user=Lx5acxMAAAAJ&hl=en)

Expertise :

Mammalia, Wildlife Management, Conservation Biology,
Biodiversity Monitoring, Ex-situ Management, BioPolicy
(CITES, IUCN, CBD, IPBES), Environmental Impact
Assessment,

EDUCATION

- 1985 :BSc. at Animal Husbandry Faculty, Brawijaya
University, Malang. Indonesia.
Major: Nutrition
- 1989: MSc. at College of Graduate Studies,Texas A & M
University, Kingsville, Texas, USA.
Major: Rangeland Management
- 1993: PhD. at PostGraduate School, Massey University,
Palmerston North, New Zealand.
Major: Wildlife Management
- 1993-1995: Post Doctoral AgResearch Ministry
of Agriculture New Zealand & Massey University,
Palmerston North, New Zealand.



WORK EXPERIENCES

- 2024-present Researcher. Research Centre for Biosystematics and Evolution- National Research and Innovation Agency (BRIN)
- 2022-2025 Lecture. Faculty of Medicine, Mahadaya University. Bandar Lampung
- 2023 Researcher. Research Centre for Applied Zoology- National Research and Innovation Agency (BRIN)
- 2022 Researcher. Research Centre for Ecology & Ethnobiology- National Research and Innovation Agency (BRIN)
- 2020-2000 Vocational Lecture. Pusat Pembinaan Pendidikan & Latihan Peneliti (PUSBINDIKLAT)-LIPI
- 1985-2022 Researcher. Research Centre for Biology, Indonesian Institute of Sciences (LIPI)
- 1993-1995 Postdoctoral Fellow at AgResearch, Ministry of Agriculture & Massey University, New Zealand.
- 1986-1988 Technical Assistance for Professor on Rangeland Management Research, Texas A & M University, Kingsville, Texas. USA.

GLOBAL CONVENTION POSITION

IPBES

- 2026-present Member .Multi Expert Panel IPBES
- 2018-2025 National Focal Point (Indonesia) for Intergovernmental Platform on Biodiversity and Ecosystem Services (UN-IPBES)
- 2019 Head of Delegation. 7th IPBES Plenary Meeting, Paris, France



- 2023 Head of Delegation 10th IPBES Plenary Meeting & Regional consultations, Bonn.
- 2023 Dialogue meeting of NFP with IPBES. Bergen, Norway

CBD

- 2025-present Member. Informal Advisory Group on Technical and Scientific Cooperation. CBD
- 2025-2017 National Focal Point for Subsidiary Body on Scientific, Technical and Technological Advice – United Nation Convention on Biological Diversity (SBSTTA-UN-CBD)
- 2024 Southern Negotiators Informal Science-Policy Dialogue on Digital Sequence Information, CBD, Cali, Colombia
- 2024 The Informal Negotiator Retreat on Digital Sequence Information on Genetic Resources (DSI), CBD, Pretoria-South Africa
- 2023 Alternate Chair, 25th Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA 25) CBD, Nairobi
- 2018-2017 Head of Delegation. Indonesian Delegation in 21st & 22nd SBSTTA-UN-CBD Meeting. Montreal-Canada.
- 2022 Member. National Delegation to COP-15 UN CBD. Montreal Canada
- 2018 Alternate Head of Delegation. Indonesian Delegation for 14th COP UN-CBD. Sharm El Sheik, Egypt.

OTHERS

- 2023 Chair. Delegation of Indonesian G-20, Circular Economy. India
- 2009-2008 Delegation of Indonesian G-20, Jakarta-Indoensia



- 2005-2006 Coordinator. Indonesian Scientific Authority CITES. Indoensian Institute of Sciences
- 2023 Workshop to Commemorate 50th Year of ASEAN-Japan Friendship and Cooperation, 11 s.d. 12 Mei 2023

WRITER OF NATIONAL & GLOBAL CONVENTION DOCUMENTS

- 2025-2024 Co-Writers Indonesia National Report 7th for UN-CBD
- 2019 Co-Writers. Indonesia National Report 6th for UN-CBD
- 2025-2020 Member: Ad-Hock Commission on developing National Strategic Actions for Conservation Strategy of Indonesian Biodiversity (IBSAP-CBD)
- 2025-2024 Member. Writer of the Indonesian Biodiversity Strategy and Action Plan-IBSAP 2025-2045. Ministry of National Development Planning- Republic of Indonesia
- 2025 Contributor for National Inventory Guide for Mammals and Herpetofauna. Official Handout for National Survey. Ministry of Forestry
- 2024-2023 Writer. The Status of Indonesian Biodiversity. Ministry of National Development Planning- Republic of Indonesia
- 2020 Co-Writer of Species Assessment on Deer, Pig, Banteng from IUCN Specialist Groups



SCIENTIFIC POSITION

- 2015-present Head of Organisation & Membership Division. Indonesian Zoo & Aquaria Association
- 2020-present Member. National Zoos Assesor, Ministry of Forestry (Ministry of Environment & Forestry)
- 2019-2025 Policy Manager, Secretariat of Scientific Authority for Biodiversity, National Research and Innovation Agency (BRIN)
- 2015-2025 Chair. National Researchers Assesor Committee. National Research and Innovation Agency (BRIN)
- 2019-2018 Head of Indonesian Institute of Sciences (LIPI) Research Ethics Committee
- 2018-2013 Head of Wildlife Management & Reproduction Laboratory. Research Centre for Biology LIPI.

PROFESSIONAL ASSIGNMENT

- 2018-present Liasson officer. Global Species Management Plant (GSMP) of Sumateran tiger, Anoa, Babyroussa and Banteng. PKBSI-MOEF (MOF)-LIPI (BRIN).
- 2022- present Member. National Committee on Research Functional Assessment. BRIN
- 2016-2022. Chair. National Committee on Research Functional Assessment. BRIN
- 2018- 2015 Head. Wildlife Management & Reproduction Laboratory, Div. of Zoology-Research Centre for Biology, Indonesian Institute of Sciences (LIPI)
- 2015-2018. Sub-Curator. Large mammals Taxa group. Museum Zoologicum Bogoriense. Research Centre for Biology LIPI.



- 2015-2014. Coordinator. LENGGURU PAPUA - Expedition on Biodiversity and Geology. IRD France & LIPI Indonesia
- 2013-2011. Coordinator. New Concept Building for Sustainable Humanosphere and Society in the Equitorial Zone of South-East Asia. Kyoto University- Research Centre for Biology LIPI.
- 2018-2016 Member. Validator Special Research on Vector & Reservoir-Ministry of Health
- 2018-2017 Member. National Committee for Researcher Regulations. Pusbindiklat LIPI.
- 2018-2015, 2008-2006. Member. National Committee for Journal Accreditation. Pusbindiklat-Lembaga Ilmu Pengetahuan Indonesia.
- 2015-2005. Sub-Curator. Taxa group Large mammals. Museum Zoologicum Bogoriense. Research Centre for Biology LIPI.
- 2008 Assesor. Global Mamalia Assessment -IUCN (Asian Region). Taxon Bovidae, Suidae, Cervidae & Tragulidae. GMA-Deer Specialist IUCN.
- 2008-2005 Coordinator. Sub-Program Domestication of Indonesian Biodiversity. Program Riset Unggulan Kompetitif LIPI Jakarta.
- 2007-1995 Head. Reproduction Laboratory, Div. of Zoology-Research Centre for Biology LIPI
- 2006-2005 Coordinator. Regular Scientific Speech. Research Centre for Biology LIPI Bogor. 2006-2005.



CERTIFICATE/BREVET

- Assessor. *Environmental Impact Assessment Universitas Indonesia* (1984), *Universitas Gadjah Mada* (2022)
- Assessor. *IUCN Red List – Mammals*.

SCIENTIFIC TRAINING

- 2018 Monitoring Captive Breeding & Ranching Facilities. CITES Secretariat. Bogor.
- 2014 Penyusun. (Brevet) *Environmental Impact Assesment. Universitas Gadjah Mada. Yogyakarta*.
- 2013 Assessor. *IUCN Red List. IUCN Secretariat England*.
- 2004 Understanding CITES. *TRAFFIC Malaysia & PPS Cikananga. Sukabumi*.
- 2002 Basic knowledge on ELISA technique. *JICA Indonesia. Bogor*.
- 2002 & 2001 Age determinations from teeth on ruminants. *JICA Indonesia, Bogor*.
- 2000 Laparoscopy and anesthetic technique in birds. *JICA Indonesia. Bogor*

SCIENTIFIC MEMBERSHIP

- Present-2023 Indonesian Species Specialist Group (IdSSG)
- Present-2021 Species Survival Commission-IUCN - SSC Banteng Specialist Group
- Present-2016 Global Species Management Planning-PKBSI, IUCN & AZA/EAZA, Banteng, Anoa & Babirusa.
- Present-2014 Species Survival Commission-IUCN - SSC Pangolin Specialist Group.



- Present-2010 Species Survival Commission-IUCN - SSC Wild Pig Specialist Group.
- Present-1996 Indonesian Zoological Society (Masyarakat Zoologi Indonesia)
- Present-2018 Indonesian Researcher Association (Perhimpunan Peneliti Indonesia)
- Present-1983 Federation Indonesian Speleological Association (FINSPEC/ HIKESPI).
- 2007-2005 Species Survival Commission-IUCN - SSC Deer Specialist Group.
- 2006-2003 The Wildlife Society. USA

CONSULTANT

- 2025-2026 The Efforts of Lore Lindu National Park to Establish a Collaborative Framework for Babirusa Conservation. Balai Taman Nasional Lore Lindu-Kemenhut-GIZ Germany
- 2024-Present Biodiversity Pomala. PT. Hatfield Indonesia & PT.VALE Indonesia. Expert Scientist
- 2024 Development of Biodiversity Action Plan and Ecosystem Services for Weda Bay Nickel. PT. Hatfield Indonesia & PT.VALE Indonesia. Expert Scientist
- 2022-2021 PT. Hatfield Indonesia & PT.VALE Indonesia. Biodiversity Assessment and LARAP study IFC Gap Fulfillment PTHI Project. Expert Scientist.
- 2016 Bornion Timbers Sdn.BH. MALAYSIA. Assessment on sambar (*Rusa unicorn*) bark stripping behavior in the rubber plantation - Strategy for Culling Recommendation. Bornion Timber SDN. Bhd. in Sabah. MALAYSIA. Team Leader.



- 2015 PT. Hatfield Indonesia. Member. Developing Biodiversity Management and Monitoring Plan for PT. Freeport Indonesia. Papua Barat. Member..
- 2014. PT HOLCIM INDONESIA Tbk. Team Leader. Rapid Appraisal of Biodiversity at a number of Concession Areas at a number of Concession Areas belonging to PT. Holcim Indonesia Tbk in Java island. Puslit Biologi LIPI.
- 2013. PT. HOLCIM INDONESIA Tbk. Team Leader. Desain Kawasan Konservasi Perbukitan dan Wilayah Perluasan Habitat Kolam di Area Konsesi PT. Holcim Indonesia Tbk. Pusat Penelitian Biologi LIPI-Cibinong.
- 2013-2012 PT. Weda Bay Nickel. Coordinator. Pre-clearance surveys for birds, reptiles, amphibians, invertebrates, molluscs, and mammals at 5 sites of PT. Weda Bay Nickel Concession Area in Halmahera. In partnership with ERA Environment Solution, NZ Ltd..
- 2013. PT Weda Bay Nickel .Team Leader. Aquatics biodiversity management and action plan implementation in PT Weda Bay Nickel (Maluku). In partnership with ERA Environment Solution, NZ Ltd.
- 2012. PT. HOLCIM INDONESIA Tbk. Team Leader. Baseline assessment on the biodiversity in karst region. In collaboration with PT. ERM Jakarta. Tuban.
- 2009-2010. P.T Weda Bay Nickel (Maluku). Team Leader. Biodiversity assessment on nickel mining concession area in Halmahera. In collaboration with PT. ERM Jakarta. Halmahera.



- 2008-2007 PT. INCO Tbk. (Sulawesi). Team Leader. The Blue Print of Mine Closure Strategy Concept. Sorowako. Sulawesi.
- 2007-2006. PT. INCO Tbk. (Sulawesi). Team Leader.. Biodiversity Survey and Formulation of Sulawesi Deer and Anoa Management. Sorowako.
- 2003-2001. Pemerintah Daerah Tk. I Prop. Kalimantan Timur (c/q Dinas Peternakan). Team Leader. Pembinaan Pengelolaan Peternakan Rusa Sambar (Rusa unicolor) di Kabupaten Penajam Paser Utara.
- 2000-1999 P.T Barito Pacific Timber (Jakarta). Team Leader. Pemanfaatan kawasan HTI untuk pengelolaan satwa liar (rusa timor, Rusa timorensis) di Sulawesi Tenggara..
- 1999-1998. P.T INHUTANI V (Jakarta). Team Leader. Master Plan on Rusa Sambar (Rusa unicolor) Ranching. Lampung.

FACILITATOR

- 2025 GIZ-Ministry of Environment. Coordination in developing Policy for Access Benefit Sharing scheme on national species and genetics.
- 2023-2024 UNDP-MOEF. Coordination in assessing the implementations of National Acts
- 2018 UNDP-MOEF. Coordination in writing National Report for Conservation Biological Diversity (CBD-UN). Dirjen KSDAE. MoEF.
- 2018 UNDP- MOEF. Combatting illegal and unsustainable trade in endangered species in Indonesia. Dirjen GAKUM. AWP-IWT.



- 2017-2016 UNDP-MOEF. Transforming Effectiveness Biodiversity Conservation in Priority Sumatran Landscape. AWP Plan 2017. Bogor.
- 2016-2015 UNDP-MOEF. Enhancing the Protected Areas System in Sulawesi. Dirjen KSDAE.
- 2016-2015 MOEF.(Ministry of Environment & Forestry). Penetapan 25 Spesies Terancam Punah.
- 2013 PUSLIT BIOLOGI-LIPI. Mechanism of CITES document.

RESEARCH AWARD

- 2025-present Understanding the impacts of feral species on Indonesian biodiversity through time
- (FERAL). Ludwig-Maximilians-Universität (LMU), Munich, Germany- National Research and Innovation Agency BRIN
- 2024-present Ekspedisi Biodiversitas Indonesia (E_Bite BRIN). National Research and Innovation Agency BRIN – LPDP.
- 2024-2018 Member: Developing Conservation Genetic methods to Investigate Population Genetics, Hybridization and Population sizes of threatened Indonesian wild boar species and deer using dna profiling and non-invasive faecal sampling. National Museum of Nature History Luxemburg (HMNH)-BRIN.
- 2024-2020 Principal Investigator. Stable Isotope application for Wildlife Forensics and Environmental Protection. Japan-ASEAN Science, Technology and Innovation Platform (JASTIP). Kyoto University-LIPI/BRIN



- 2023 Member. The Increasing Population of Bawean Deer (*Axis kuhlii*) Through the Application of Reproductive Technology (Peningkatan Populasi Rusa Bawean (*Axis kuhlii*) Melalui Aplikasi Teknologi Reproduksi). Rumah Program Scheme - BRIN
- 2023-2022 Principle Investigator. Age and body growth of the water lizard (*Varanus salvator*) and its reproductive patterns as a scientific basis for sustainable use management. [Umur dan Pertumbuhan Tubuh Biawak Air (*Varanus salvator*) Serta Pola Reproduksi sebagai Landasan Ilmiah Dalam Tata Kelola Pemanfaatan Berkelanjutan]. Exploration Funding - BRIN.
- 2015-2013 Member. Rapid appraisal of the endemic, near-extinct Bawean pig (*Sus blouchi*). IUCN/SSC Wild Pig Specialist Group-Switzerland..
- 2014-2011 Member. Comparative study on comprehensive forest management systems in Southeast Asia Kyoto University- Research Centre for Biology-LIPI.
- 2013-2012. Principal Investigator. Evaluation on the captive breeding model on Malay pangolin *Manis javanica*. Kompetitif LIPI.
- 2010-2009. Principal Investigator. Distribution and Characterization of Indonesian endangered mammal species for Conservation Strategy development. Riset DIKTI-LIPI.
- 2010-2008. Member. Breeding selection in Captive sambar deer (*Rusa unicolor*) for domestication purposes. Riset Kompetitif LIPI Sub-Program



Domestikasi Keanekaragaman Hayati Indonesia.

- 2010-2007. Member. The establishment of Javan warty pig captive breeding. Research Centre for Biology LIPI, LA Zoo (USA) & PPSP Cikananga Sukabumi.
- 2004-2003. Principal Investigator. The use of Indonesian deer as protein source alternative in remote area. UPT Biomaterial - Puslit Bioteknologi LIPI.

PUBLICATION- BOOK

Awasthi, N & **G. Semiadi**. 2025. Sambar deer (*Rusa unicolor*). In: Deer of the World. Ecology, Conservation & Management (M.Melletti & S.Focardi, eds). Springer Nature. Switzerland. 223-236. <https://doi.org/10.1007/978-3-031-17756-9>

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