



UNITED NATIONS ENVIRONMENT PROGRAMME

Programme des Nations Unies pour l'environnement Programa de las Naciones Unidas para el Medio Ambiente
 Программа Организации Объединенных Наций по окружающей среде برنامج الأمم المتحدة للبيئة

联合国环境规划署



PROJECT DOCUMENT

SECTION 1: PROJECT IDENTIFICATION

1.1 Project title: Conserving, Enhancing and Managing Carbon Stocks and Biodiversity in The Chernobyl Exclusion Zone

1.2 Project number: GFL/4634

PMS: 785

1.3 Project type: FSP

1.4 Trust Fund: GEF

1.5 Strategic objectives:

GEF strategic long-term objective: BD1 CCM-5 LD-3

Strategic program for GEF IV: NA

1.6 UNEP priority: Ecosystem Management; Environmental Governance

1.7 Geographical scope: National

1.8 Mode of execution: Internal

1.9 Project executing organization: UNEP/ROE

1.10 Duration of project: 48 months

Commencing: January 2015

Technical completion: December 2018

Validity of legal instrument: 48 months

1.11 Cost of project in US\$

	US\$	
Cost to the GEF Trust Fund	4,863,955	14.65%
Co-financing		

Cash

Government of Ukraine	17,300,000	52.10%
GMFMC	20,000	0.06%
UNEP	70,000	0.21%

Sub-total **17,390,000** **52.37%**

In-kind

Government of Ukraine	10,700,000	32.23%
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GMFMC	20,000	0.06%
UNEP	230,000	0.69%
<i>Sub-total</i>	<i>10,950,000</i>	<i>32.98%</i>
Co-financing total	28,340,000	85.35%
Grand Total	33,253,955	100%

1.12 Project Summary

The project objective is enhanced conservation and management of carbon stocks and biodiversity in forest and non-forest lands in the Chernobyl Exclusion Zone (ChEZ). The project aims to expand current use of the Chernobyl Exclusion Zone to encompass ecosystem values and in so doing provide ecosystem services to the benefit of local, national and international stakeholders. Biodiversity focused management is to be mainstreamed into the public sectors responsible for the use and management of the natural resources of the ChEZ. In order to do this in a sustainable way, project involvement and support of social and stakeholder engaged processes are ensured where science and policy work together to allow for the uptake of the results of the project. The project consists of local, national, regional and international scale activities which will contribute to development and implementation of an expanded protected area network in and around the ChEZ, and accompanying management processes in the context of a governmental commitment to expand current productive uses in the ChEZ to the social, economic and environmental benefit of all stakeholders. Mainstreaming of project results will be aided by the participation and ownership of stakeholders in this project. In order to facilitate this participation, close communication channels between project managers, governmental ministries, agencies and departments, scientists at national and international levels, and inhabitants around the ChEZ will be established. This communication will inform scientists as they strive to fill important data and information gaps, while communications between scientist and stakeholder will ensure buy-in and ownership. While the central focus of the Project is the ChEZ, officials from Belarus generally, and specifically from the Polesky Nature Reserve (Reserve), were involved during project preparation. Close cooperation and joint activities with the Reserve will continue during project implementation.

The project has three substantive components and two additional components for project management and monitoring and evaluation. Component 1 is improved monitoring and research for large areas of forests, wetlands, and other habitat types and associated carbon benefits in the ChEZ. It will result in creation of a Research and Environmental Protection Center, which will take the lead in efforts to collect and synthesize existing research, undertake a gap analysis, and develop and implement a research program consistent with Component 2 is establishment and management of a full protected area network. The new protected area network will enable protection of biodiversity, mitigate land degradation and maintain carbon stocks in large areas of forest and non-forest lands, including wetlands and other habitat within the ChEZ. This component will include a wide reaching dissemination strategy to secure participation, build and strengthen partnerships, and contribute to further understanding and appreciation of the social, economic, and environmental benefits that will accrue to the ChEZ and surrounding area. Civil society engagement will include informal presentations and media communications on the project and its relevance to society at large. Component 3 captures lessons learned, field-testing and dissemination of results. Component 3 will ensure mainstreaming of project results. The communication process of this Component will include traditional scientific publications to demonstrate the credibility and applicability of project results. The participation of international scientific organizations in project activities will facilitate the communication of results as well as help in ensuring replication in other areas as necessary. Lessons learned will be made widely available through written reports, the project website, and through training manuals developed and distributed by the Research and Environmental Protection Center.

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Acronyms and Abbreviations

AEWA	African-Eurasian Waterbird Agreement
ARCH	Agenda for Research on Chernobyl Health
CBD	Convention on Biological Diversity
CBO	Community Based Organization
CS	Cesium
ChEZ	Chernobyl Exclusion Zone
CRDP	Chernobyl Reconstruction and Development Plan
CMS	Convention on Migratory Species
EAP	Eastern Partnership Community
EbA	Ecosystem-based Adaptation
EBRD	The European Bank for Reconstruction and Development
ENPI	European Neighborhood Partnership Instrument
EOU	United Nations Environment Program Evaluation and Oversight Office
EU	The European Union
FCM	Fuel Containing Mass
Gcal	Giga calorie
GEBS	Global Environmental Benefits
ha	hectare
IAEA	International Atomic Energy Agency
ICRIN	International Chernobyl Research and Information Network
MENR	Ukraine Ministry of Ecology and Natural Resources
NGO	Non-Government Organization
GoU	Government of Ukraine
NBSAPs	National Biological Strategic Action Plans
NSC	New Safe Confinement
NPP	Nuclear Power Plant
PEBLDS	Pan-Eurasian Biological and Landscape Strategy
PoW	UNEP biennial Programme of Work
PA	Protected Area
PU	Plutonium
SAEZ	State Agency of Ukraine on the Exclusion Zone Management
SIP	Shelter Implementation Plan
SR	Strontium
STAP	Science and Technical Advisory Panel of the GEF
UN	United Nations
UNCDD	United Nations Convention to Combat Desertification
UNFCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environment Program
UNEP-ROE	United Nations Environment Program-Regional Office Europe
UNDP	United Nations Development Program
UN-OCHA	United Nations Office for the Coordination of Humanitarian Affairs
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
WB	The World Bank
WHO	The World Health Organization
WWF	the World Wildlife Fund

SECTION 2: BACKGROUND AND SITUATION ANALYSIS (BASELINE COURSE OF ACTION)

2.1 Background and Context

The Accident

1. On April 27, 1986, an operating crew at the Chernobyl nuclear power plant complex tested whether Reactor No. 4 turbines could produce enough energy to keep coolant pumps running until an emergency diesel generator could be activated in case of an external power loss. During the test, power surged unexpectedly causing an explosion, and temperatures in the reactor reached more than 2,000 degrees Celsius, melting the fuel rods, igniting the reactor's graphite covering, and releasing a cloud of radiation into the atmosphere. While the precise causes of the accident are still uncertain, it is generally believed that a series of incidents led to the explosion, fire and nuclear meltdown, including a combination of reactor design flaws and operator error.

2. In an attempt to quell the fire and prevent further substantial release of fission products, boron and sand were poured on the reactor from the air. In addition, the damaged unit was entombed in a temporary concrete sarcophagus. Nonetheless, even though a number of other control measures were undertaken at and in the vicinity of the plant site, including removal and burial of a highly contaminated pine forest of approximately 2.5 sq. km. (called the "Red Forest" because of radiation effects on radiation sensitive pines), large quantities of radioactive contamination were released into the atmosphere, which spread over much of western Russia and Europe. Eventually much of this contaminated forest was uprooted and buried. And while some Chernobyl radiation was detectable thousands of kilometers from the accident, the most severely impacted areas were those in the immediate area of the site, and most particularly areas immediately to the west in Belarus, which absorbed seventy percent of the radioactive fallout, and where 3,600 towns and villages and some 2.5 million people were affected.

3. As a result of the accident, a contaminated zone with a 30-kilometer (19-mile) radius around the Chernobyl plant was established. Access to this area, commonly referred to as the Chernobyl Exclusion Zone (ChEZ) remains prohibited, except for persons requiring official access to the plant and to the immediate area for evaluating and dealing with the consequences of the accident and operation of the undamaged units.

4. According to the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR 2008, P. 53) population evacuated from the most heavily contaminated areas numbered approximately 115,000 in 1986, and another 220,000 people in subsequent years. And according to the World Health Organization (WHO) 240,000 recovery workers were engaged in Chernobyl clean-up work in just two years - 1986 and 1987. Eventually, 600,000 people in Belarus, the Russian Federation and Ukraine were designated as Chernobyl "liquidators."

5. Pripyat, the town near Chernobyl where most of the workers at the plant lived before the 1986 disaster, was evacuated within several days because of severe radiological contamination. It was then included in the 30-km Exclusion Zone around the plant and is closed to all but those with authorized access.

6. Construction of a concrete sarcophagus covering the destroyed Chernobyl Unit 4 was started in May 1986 and completed by Soviet authorities six months later in November. It was quickly built as a temporary "fix" to channel remaining radiation from the reactor through air filters before being released into the environment. After several years, uncertainties about the actual condition of the sarcophagus, primarily due to the high radiation environment, began to emerge.

7. In 1997, the countries of the G-7, the European Commission and Ukraine agreed that a multilateral funding mechanism be established to help Ukraine transform the existing sarcophagus into a stable and environmentally safe system through the Chernobyl Shelter Implementation Plan. The Chernobyl Shelter Fund was established to finance the Plan. The European Bank for Reconstruction and Development (EBRD) was entrusted with managing the Fund. The Plan is intended to protect the personnel, population and environment from the threat of the very large inventory of radioactive material contained within the existing sarcophagus for many decades. First, the existing sarcophagus was to be stabilized and eventually replaced with a new safe shelter (confinement). New shelter construction started in late 2006 with a design that was to include an arch-shaped steel structure, which would slide across the existing sarcophagus via rails. This new structure, to be completed in 2015, is designed to remain functional for 100 years.

8. In 2003 the Chernobyl Forum (Forum) was created to accumulate existing and promote further knowledge on all aspects of the Chernobyl heritage. The Forum consisted of the International Atomic Energy Agency (IAEA), World Health Organization (WHO), the United Nations Development Program (UNDP), the United Nations Environment Program (UNEP), the World Bank, the Food and Agriculture Organization (FAO), and the United Nations Office for the Coordination of Humanitarian Affairs (UN-OCHA) and representatives of Belarus, the Russian Federation and Ukraine. Within the Chernobyl Forum, there were a number of working groups with nearly 100 experts from Belarus, Russia, Ukraine and international organizations. The Forum's findings¹ on medical, environmental, social and economic aspects of the Chernobyl heritage are central to both the Government's and international organizations' approach towards addressing the consequences of the tragedy, and its findings are extensively used in this project proposal.

Chernobyl related death and disease

9. While the human toll - illness and death - resulting from the Chernobyl accident is subject to continuing debate², there is no question that the toll has been significant by any measure.

10. By mid-2005, fewer than 60 deaths could be *directly* linked to the Chernobyl accident. These deaths were of workers who exposed to massive radiation during the accident, and children who developed thyroid cancer. However, estimates of the eventual death toll from Chernobyl vary widely. A 2005 report by the Chernobyl Forum - produced by eight cooperating U.N. agencies - estimated the accident eventually would cause about 4,000 deaths, a figure later elevated to 9,000. However, some NGOs, as a result of considering effects over a broader geographic area and factoring in disease endpoints additional to cancer, have estimated the figure at 93,000 deaths, based on information from the Belarus National Academy of Sciences.

11. The Belarus National Academy of Sciences further estimates that 270,000 people in the immediate region around the accident site will develop cancer as a result of Chernobyl radiation, and that 93,000 of those cases are likely to be fatal. Another report by the Center for Independent Environmental Assessment of the Russian Academy of Sciences found a dramatic increase in mortality since 1990 - 60,000 deaths in Russia and an estimated 140,000 deaths in Ukraine and Belarus - probably due to Chernobyl radiation.

¹ "Chernobyl's Legacy: Health, Environmental and Socio-Economic Impacts and Recommendations to the Governments of Belarus, the Russian Federation and Ukraine." The Chernobyl Forum, Second revised version.

² In circumstances where people are exposed to low-level radiation, and many millions of people across Europe were in fact exposed as a result of the Chernobyl accident, studies are unlikely to be able to demonstrate a statistically significant increase in cancer due to the so-called 'statistical noise' that includes cancer incidence from many other causes, the long latency period for some cancers and other endpoints, limited data on disease incidence, the physical parameters of the study, and various other data gaps and methodological difficulties.

Socio-economic effects

12. In addition to human health issues, there have also been considerable socio-economic effects. After the accident, Soviet authorities resettled more than 350,000 people, including the nearly 50,000 people from nearby Pripyat. After the breakup of the Soviet Union, many projects intended to improve life in the region were abandoned, and young people began to move away to pursue careers and build new lives in other places. In many villages, up to 60 percent of the population is made up of pensioners and in most of these villages, the number of people able to work is two or three times lower than normal.

13. Principal socio-economic effects stemming from the accident have included:

- Huge costs to the economies of Ukraine, Belarus, and the Russian Federation. The three governments continue to payments in the form of social benefits to as many as 7 million inhabitants. In Belarus alone estimated losses since the accident have been valued at US\$ 235 billion. And in Ukraine 5-7% of annual state budgets continue to be committed to Chernobyl related benefits and programs. An unintended consequence to continued assistance is a sense of victimization and dependency.
- There has been a dramatic and negative effect on agriculture, which, given the rural nature of most of the affected lands, has been devastating to many of the local communities. According to the Report of the Chernobyl Forum (2005) a total of 784,320 hectares of agricultural land was withdrawn from production in the three countries, and timber production was halted for a total of 694,200 hectares of forest. Restrictions on agricultural production crippled the market for foodstuffs and other products from the affected areas. "Clean food" production has remained possible in many areas thanks to remediation efforts, but this has entailed higher costs in the form of fertilizers, additives and special cultivation processes.
- Notwithstanding that recovery of some of the affected lands now make possible safe agriculture production consumers are reluctant to purchase the products. This "branding" problem, as described in the Forum report, has been difficult to overcome, adding to the economic problems that are widespread in Chernobyl affected areas.
- According to the Forum report, communities in the affected areas suffer from a highly distorted demographic structure. As a result of resettlement and voluntary migration, the percentage of elderly individuals in affected areas is abnormally high. In some districts, the population of pensioners equals or already exceeds the working-age population. In fact, the more contaminated a region, the older its population. A large proportion of skilled, educated and entrepreneurial people have also left the region, hampering the chances for economic recovery and raising the risk of poverty.
- Even where remediation measures have made farming safe, the stigma of Chernobyl has caused some consumers to reject products from affected areas. Food processing, which had been the mainstay of industry in much of the region, has been particularly hard-hit by this "branding" issue. Revenues from agricultural activities have fallen, certain types of production have declined, and some facilities have closed altogether.

14. Although resettlement reduced the population's radiation doses, it was and continues to be for many a deeply traumatic experience, adding a psychological dimension to the dislocation. Even when resettled individuals were compensated for their losses, offered free houses and given a choice of resettlement location, many retained a deep sense of injustice about the process. Unemployment is widespread, and there is a belief among many resettled individuals that they have no place in society and have little control over their own lives.

15. Also according to the Forum report, opinion polls suggest that many re-settlers wish to return to their native villages. The UNDP and other national and international entities have recognized that re-populating rehabilitated Chernobyl lands is not simply a question of objectively demonstrating that

they are safe. It has also to do with providing people the convincing, objective *evidence* that it is safe.

Effects on fauna

16. It has been documented that animals living in Chernobyl contaminated areas did suffer a variety of radiation-induced effects. These effects included oxidative stress, and low levels of antioxidants have had severe consequences on the development of the nervous system, including reduced brain size and impaired cognitive abilities.

17. It is generally agreed that the absence of humans, and consequent absence of human induced effects on the landscape, has led to quite substantial increases in wildlife populations in the ChEZ. However, whether current and growing populations would be greater still in the absence of radiation contamination is a subject of continuing debate. Some scientists have argued that while the increase in many animal populations is undeniable, radiation effects have depressed the populations that would otherwise exist given the absence of human populations and their effects. Other scientists claim that radiation effect in the zone is now below levels that would have negative effects on wildlife populations, and thus populations are growing at rate similar to that which would exist in any setting absent human populations.

18. Aside from disagreement of continuing effects on the numbers of wildlife populations from the Chernobyl disaster, there continue to be levels of radiation in certain game animals that make them unfit for human consumption. Some studies indicate³ that as late as 2010 boar (wild pigs), deer and potentially other creatures are still unfit to eat, despite living more than 1500 kms. away from the Chernobyl disaster. Depending on what the boar and deer consume, anywhere from 20% to 80% of the animals are contaminated with radioactive Cesium 137, making them unfit to eat due to high radiation levels.

19. Further, birds living in areas with high levels of radiation have statistically significantly smaller brains, which can lead to viability deficits in the wild and a decrease in fitness⁴. Barn swallows (*Hirundo rustica*) that live in or around Chernobyl have displayed an increased rate of physical abnormalities compared to swallows from uncontaminated areas. Abnormalities include partially albinistic plumage, deformed toes, tumors, deformed tail feathers, deformed beaks, and deformed air sacks. These effects are likely due to radiation exposure, and to elevated teratogenic effects of radioactive isotopes in the environment⁵.

Effects on flora

20. There is a great difference in the ability of trees to respond to large doses of radiation. In general, Scotch pine, a plantation tree that dominates certain parts of the ChEZ, and a species that is suited to the sandy soils in that part of Ukraine, are highly sensitive to radioactive fallout. Consequently, the Red Forest gets its name from the red-brown color of the dead Scotch pine trees, killed by radiation exposure in 1986. Today, even though the amount of radiation has been greatly reduced by decay, Scotch pines are only now beginning to grow in the un-remediated Red Forest region. On the other hand, birch trees survived the radiation; these trees continue to grow and appear healthy. But the

³ Cited in: Juergen Baetz, 'Radioactive boars in Germany a legacy of Chernobyl'. The Associated Press, April 2011. Accessible at: <http://www.csmonitor.com/World/Latest-News-Wires/2011/0401/Radioactive-boars-in-Germany-a-legacy-of-Chernobyl>; 'Wild Boars Contaminated by Chernobyl Radiation'. The Associated Press, August 19, 2010.

⁴ Möller, Anders Pape; Bonisoli-Alquati, Andea, Rudolfsen, Geir, Mousseau, Timothy A., Brembs, Björn. "Chernobyl Birds Have Smaller Brains". Research article, *PLoS ONE* 6 (2): e16862. Feb. 2011. Accessible at: <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0016862>

⁵ Ibid

response of the Scotch pines is an obvious example of the negative effects of exposure to radiation.

Current ChEZ natural resources – The natural recovery process

21. Prior to the accident, approximately 40% of the current 2,600 km² ChEZ was under cultivation and produced grain, forage crops, potatoes, and dairy and meat products. The remaining 60% was forested, or otherwise characterized by high productivity and biodiversity.

22. The evacuation and abandonment of supporting infrastructure, across some 6,000 km² in Ukraine, Belarus and Russia, took place in a matter of days. Maintenance of agricultural lands – for example plowing, fertilizing, livestock grazing, harvesting of forage, recreational use, game management, timber and non-timber forest products harvesting, maintenance of ameliorative systems – was ended. As a consequence, ecological systems over much of the abandoned landscape, which had undergone man-induced transformations during hundreds of years, were suddenly devoid of human population and its effects, and have for the past 27 years been subject to natural processes. At this time, only infrastructure necessary to access the Chernobyl NPP (including the cooling pond), the city of Chernobyl, and the main roads for delivery of personnel and cargo to them have been maintained.

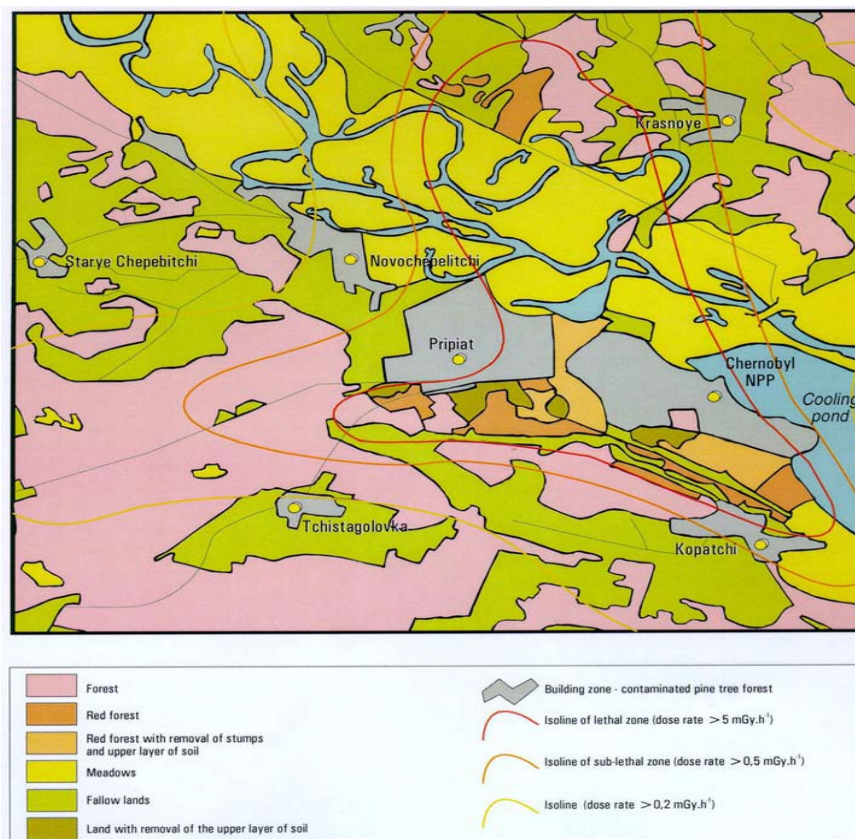
23. Local habitat diversity is classified into 23 different terrestrial and 7 aquatic phyto-systems, 12 terrestrial and 8 aquatic zoo-systems, 5 types of landscapes and up to 15 types of soils. More specifically, the ChEZ landscape is divided into forest land and non-forest land. At present, 28 years after the accident, the forested landscape has expanded to 151 thousand hectares (72%), while the remaining 60.4 thousand hectares (28%) is former agricultural land in various stages of succession. For the most part, the ChEZ non-forested landscape, just under 49,000 ha, is comprised of lakes (35.6%) and wetlands (34.2%) which are rich in peat. The remainder (29.2%) includes the Chernobyl nuclear power stations and land committed to contaminated product storage.

24. In summary, a unique gradual restoration of autochthonous biological systems is currently in process in the ChEZ. Vast areas of wetlands and forests are undergoing natural renewal processes. These protected ecosystems therefore now:

- Host increasingly important populations of globally important species;
- Host an increasing area of forest that acts as a significant carbon-sink, thus contributing to climate change mitigation;
- Contribute to the protection and improvement of water quality; and
- If well-managed, will contribute to the decrease of fire hazards within the region.⁶

25. The general land use pattern that now exists in the ChEZ is depicted in the figure below:

⁶ ‘Chernobyl’s Legacy: Health, Environmental and Socio-economic Impacts and Recommendations to the Governments of Belarus, the Russian Federation and Ukraine’ The Chernobyl Forum: 2003–2005. Second revised version.

Figure 1: Chernobyl Exclusion Zone land use – post-accident

The forested landscape

26. The latest forest inventory data (VO “UKRDERGLISPROEKT”⁷) for the ChEZ, also known as the State Special Complex Enterprise, or “Chernobyl Pushcha”, indicates a forest cover of 211.4 thousand hectares (including previous agricultural lands that are now in various stages of succession), and is divided into seven forest districts. The average area of each forest district is 34.4 thousand hectares, and varies considerably. For example, the smallest district, the Kotovsk, occupies 7.2% of total area the ChEZ; whereas the largest, the Lubyanka district, covers 25.6% of the ChEZ. These assessments would be revisited early in project implementation through use of high-resolution remote sensing technology.

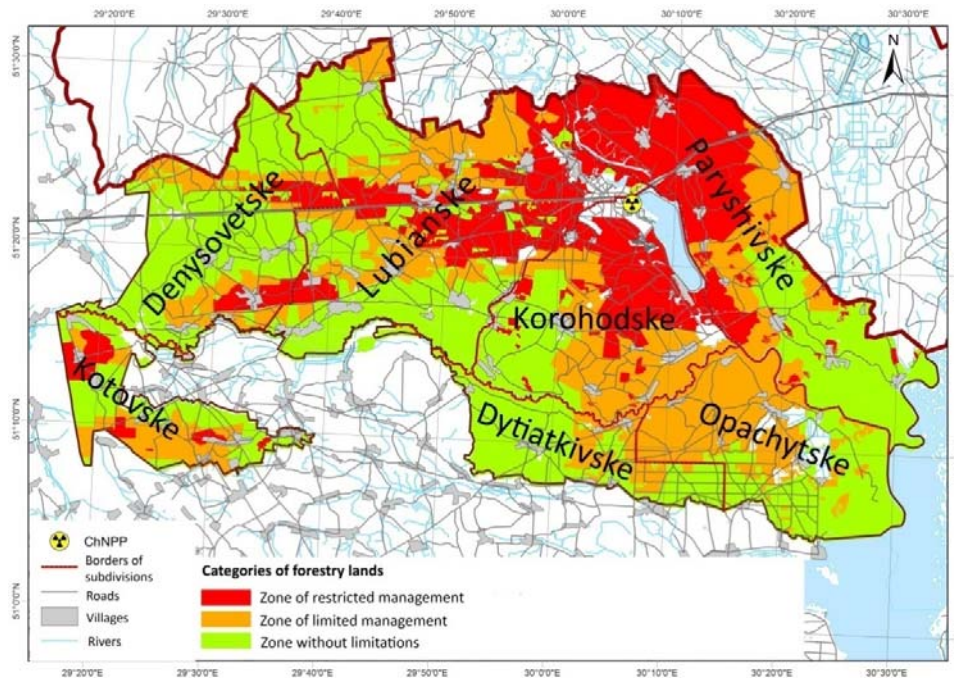
27. All forestland is further divided into three functional zones based on level of contamination and related management considerations. The three zones, depicted in the figure below, include:

- A zone covering 23.4% which is highly contaminated and in which there is no active management;
- A zone covering 31.2% which is moderately contaminated and where there are limited ecological and silvicultural activities; and
- A zone covering 45.4% with low contamination and where silvicultural activities conditions are allowed.

⁷ Project f Forest Management for Special Forest State Enterprise “Chernobyl Puscha” for 2006 - 2016”. State Enterprise Ukrainian forest project” (UKRLISPROEKT).

28. Each of the seven forest districts include all three zones in different proportion, and thus no single zone can be considered entirely safe for forest workers and other visitors to the zone. The zones are illustrated in the figure below:

Figure 2 The 7 Forestry Zones of the ChEZ and Management Levels in Each

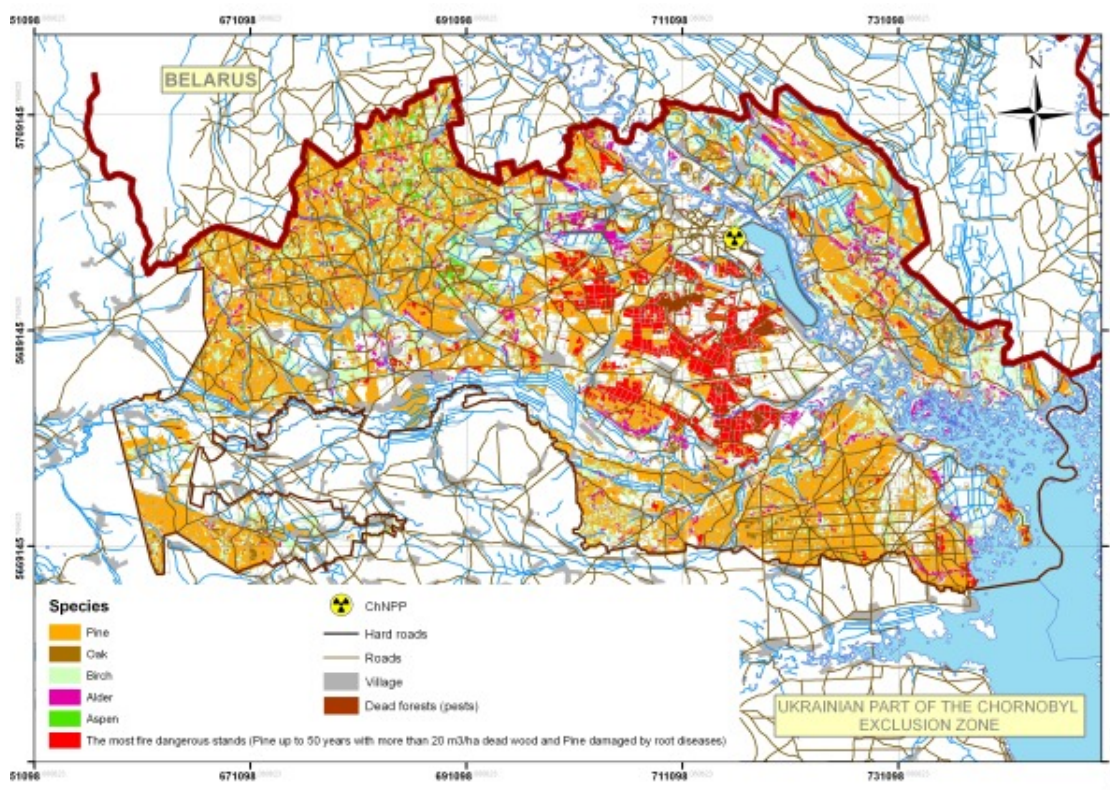


29. ChEZ forests are representative of temperate forest types of with the following species group distribution:

- Conifers (99% - Scotch Pine) 89.9 thousand hectares (59.5% of forest lands and 73.3% of total growing stock), softwood - 52.9 thousands hectares (35.1% of area and 21.9% of the total growing stock); and
- Hardwoods – 8.2 thousand hectares (5.4 % of area and 4.8% of the total growing stock).

30. The average growing stock in ChEZ is 222 cubic meters per hectare. Among the other tree species (other than Pine), second position is held by Birch (*Betula varricosa*) – 38.8% of stands (4.9 mln. cub. m), Alder (*Álnus glutinósa*) – 6.6% of forested lands and 5.8% of growing stock, Oak (*Quercus robur*) – 3.3% and 1.8% respectively. Of total forested lands, 353,000 hectares, or 55.3%, is comprised of Scotch Pine semi-natural plantations, of which 30.6% appear infected by “root rot” (*Fomitopsis annosa*). The age structure of forests in ChEZ is uneven: with prevailing (61.9%) middle-aged stands for Pine – 41-60 years old; young stands (17.3%) and pre-mature stands (11.9%) for pine – 0-40 years old; and mature and over-mature stands (8.9%) for pine 61-100 years old. Overall forest composition in the ChEZ is depicted in the figure below:

Figure 3: Composition of the ChEZ



31. Based on forest inventory data of the State Enterprise “Ukrainian forest project” (UKRLISPROEKT) of 2006⁸, the total growing stock of forests within the ChEZ is 33.6 million cubic meters. Of this amount 60.1% is classified as “unavailable for harvesting” due to radiological limitations and road availability restrictions. Other timber could theoretically be harvested on condition that contamination control procedures are adopted. The table below summarizes the available and unavailable forest for harvesting within the seven forest areas of the ChEZ:

⁸ Project of Forest Management for Special Forest State Enterprise “Chernobyl Puscha” for 2006 - 2016”. State Enterprise “Ukrainian forest project” (UKRLISPROEKT). P.34.

Table 1. ChEZ Available and Unavailable Forest for Harvesting

Forest range	Theoretically Available		Unavailable	
	Ha	Thousands cub m	Ha	Thousands cub m
Denysovychy	13646.8	3276.6	12057.1	2910.9
Dytiatky	9677.9	2609.9	3796.9	987.5
Korogod	5199.2	1323.5	12112.8	3277.4
Kotovsk	1481.9	363.2	6355.5	1530.1
Lubjanka	11669.3	2669.5	27872.0	5927.7
Opachichi	7007.9	1593.5	10895.8	2177.3
Paryshiv	8516.0	1580.6	20716.5	3406.2
Total	57199.0	13416.7	93806.6	20216.0

Wetland areas of the ChEZ

32. The rich wetlands of the ChEZ continue to contain large, species rich wetlands. These wetlands include: Podira (New Shepelitske, 423 hectares); Moskalivna (New Shepelitske, 715 hectares); Galo Illinetske (Korogod, 930 hectares); Galo Tovstolisske, 230 hectares; Chyste, 195 hectares; Krut, 181 hectares; and Nosachi, 159 ha. The Marsh area of the ChEZ is particularly rich in species diversity⁹. Taken together, ChEZ wetlands total over 2,800 hectares, and are situated largely in the eastern part of the ChEZ. Presently there are 11 areas legally dedicated to nature conservation in Ukraine (Balashov, Francevich, 1996, Francevich, Balashov, 1997). But their total area is less than 0.9% of the ChEZ area. Their value has been lost in part due to weak protected status, management deficiencies, and wildfire damage.

Management of Natural Resources in the ChEZ

33. In Ukraine, the 2600 km² Chernobyl Exclusion Zone was established by law, and resulted in a special form of governance based on lands within the zone being characterized as radioactively hazardous, taken out of circulation, and separated from the surrounding territories. In summary, the primary objective in the Ukraine ChEZ was the prevention of human exposures within the zone and radioactivity carry-over outside of the zone.

34. In the area adjacent to the ChEZ in Republic of Belarus, downwind of the accident, the 2,150 km² “Polesky State Radiation Ecological Reserve” was established, with a principal emphasis being the conduct of environmental and research activities in the context of an ecological reserve.

35. Unlike the objectives in Belarus, the conservation of biodiversity and natural resources was initially not considered among the objectives for the establishment of the Ukraine ChEZ. However, the sudden and quasi-total protection status of the vast territory, the absence of human population, the low level of anthropogenic impact on nature, and the effort to allow the natural recovery of the ecosystems without human intervention provided a de-facto large conservation area for biodiversity and natural resources. The ChEZ is enclosed along its perimeter and equipped with checkpoints. Access to, and all

⁹ A Government of Ukraine compilation of highly endangered, endangered and rare species. Redbook listed species found in the exclusion zone include: *Lilium martagon* L., *Goodyera repens* R.Br., *Epipactis helleborine* (L.) Crantz., *Dactylorhiza majalls* (Reich.) P.F.Hunt. et Summerhayes, *Neottia nidus-avis* (L.) Rich, as well as such rare plant communities as *Pinetum hylocomiosum*, *P. vaccinioso-hylocomiosum*, *R. myrtilloso-hylocomiosum*, *Querceto-Pinetum coruloso-pteridiosum*, *Q.-P. coryloso-varioherbosum*, *Q.-P. coryloso-convallariosum*, *Carpineto-Quercetum caricosum* (pilosae) (Balashov, Francevich, 1996, Zibtsev et al, 2012).

types of activities within ChEZ are subject to regulation and control, although recently the government has been allowing a limited number of escorted tours in the zone and to the plant site.

36. Though some minimal levels of industrial enterprises and patrol or monitoring personnel have been continuously active within ChEZ, these activities have impacted only 5-10% of the total area. However, the very substantial perimeter of the ChEZ makes it impossible to keep the zone completely closed to illegal human activity. Nearly 200 people, “samosely”, former residents of villages within the ChEZ, have now returned to their former homes. Samosely are mostly elderly, have an average age of 60 to 65, and their movement back into the ChEZ is technically illegal. Each of the former villages within the ChEZ have 10 or fewer samosely in residence. Given the lack of infrastructure in the zone, samosely rely heavily on small, labor-intensive vegetable gardens for food production. Aside from the potential danger of eating contaminated product, some of the wildfires that have occurred within the zone have been caused by samosely as in preparation for spring planting they burn residual crop waste from the previous growing season. This practice has been the source of a considerable number of wildfires in the zone.

37. The samosely are not the only trespassers into the zone. There are also an unknown number of people who have quietly moved into the ChEZ to occupy abandoned houses. These longer-term trespassers, and others who move into and out of the zone on any given day, enter for purposes of the illegal harvesting of timber, collection of mushrooms and berries, hunting, and fishing, or just trekking through the zone for what is termed “extreme tourism.” The local militia has made some arrests of people attempting to transport illegally harvested timber out of the zone, but the problem persists.

38. In addition to illegal activities within the ChEZ, some of the areas in proximity to it were also closed to forest and other natural resource use after the disaster. The population living in these affected areas was traditionally engaged in agricultural activity, and has poorly adapted to the situation after the Chernobyl accident. Although the passage of radionuclides into the food chain can be reduced to a large extent by the careful selection of crops, specific agricultural methods and targeted fertilization, the market value of food products from these areas is still very low. Several hundred thousand small farmers who live on the Chernobyl-affected lands often subsist on their own products, as agriculture for these farmers is no longer commercially viable.

39. Thus in general areas abutting the zone can accurately be characterized as economically depressed, and this has led to a growing interest on the part of governments and others to address the very substantial array of socio-economic issues that have characterized the general area over the past 28 years.

40. As is the case with the limited number of people who are accessing the zone, people in the immediate vicinity of the zone also rely on forest products as an essential income source. More specifically, many households in the immediate vicinity of the zone rely on small private vegetable gardens of up to 1 ha. and home animals (1-2 cows and home pigs, chickens etc.) as a main source of food, while using generally meager salaries or pensions to cover utilities and other miscellaneous needs. Under these difficult economic circumstances the need to supplement critical human needs from available natural resources trumps warnings on consumption of products from a contaminated landscape, even in the context of general, if not specific awareness of the dangers.

41. In general, there is poor awareness of specific exposure dangers on the part of local populations. For example, private forestry brigades hired for forestry operations by Ivankiv and Poleskiy State Forestry Enterprises (in the South and Western vicinities of the ChEZ) consist of mostly local villagers. They use the traditional method of burning forestry residues (branches and needles) left after

harvesting. While government issued “Rules of final harvesting in forests of Ukraine” generally recommends this practice, it is specifically prohibited in the zone. Unfortunately, this prohibition seems not to have been effectively communicated to forest workers in and around the zone, who, as a consequence, routinely ingest radioactive smoke.

Summary

42. In summary, for the past 28 years up to 80% of the ChEZ has existed in *de facto* reserve status, and impacts on the land have been largely natural in origin. These natural impacts include forest fires, floods, windstorms, and impacts from growing populations of fauna. The result has been a significant increase in biodiversity¹⁰, particularly in the formation of a complex mosaic of undisturbed forest and non-forested areas, an increase in wetlands area, and a substantial increase in the number of species and species populations.

Current extent of protected status in the ChEZ

43. A total of 13 Protected Areas were already established within the current ChEZ prior to the accident under the “Nature Reserve Fund” legislation. Another Protected Area (the “Generic Zoological Game Reserve of National Importance” or “Chernobyl Special”) was added in 2007 and enlarged the total conservation area in the ChEZ to 20%.

44. However, all of these Protected Areas currently fall under a low category of legal protection, and an Environmental/Protected Area Management structure is not in place for any of them. Notwithstanding the limitations in physical scope and low level of legal protection, the above initial steps by the Government of Ukraine demonstrate a commitment to and recognition of the region’s value for biodiversity conservation, and the government commitment to this project, especially work underway to create a Biosphere Reserve for the ChEZ, demonstrates government intention to substantially expand both the size of the extant protected area the level of protection that the zone will have. Additionally, in late 2012, as part of a government reorganization, the Agency for the Management of the Chernobyl Exclusion was placed under the aegis of the Ministry of Ecology and Natural Resources, signaling an intent to integrate the ChEZ into overall government efforts to broaden activities in the ChEZ by incorporating ecological considerations into future planning and management.

45. The now semi-natural ecosystem within the ChEZ is bio-geographically well connected with all natural ecosystems within and adjacent to its boundaries, including those Protected Areas already having some form of legal protected status. Taken together, these ecosystems total approximately 400,000 ha. In particular, The ChEZ borders with the “Dnieper-Teteriv Forestry and Hunting Reserve” (30,400 ha) to the South, with “Drevlyansky” (30,873 ha) and “Polessky” (20,104 ha) Natural Reserves to the West, with the extensive Polessky State Radiation Ecological Reserve (Belarus, 215,000 ha) to the north, and with the “Mizhrichynskyi” Regional Landscape Park (102,500 ha) to the East. The ChEZ is also situated at the intersection of the Pripjat and the Dnieper corridors within the European

¹⁰ ‘Chernobyl’s Legacy: Health, Environmental and Socio-economic Impacts and Recommendations to the Governments of Belarus, the Russian Federation and Ukraine’ The Chernobyl Forum: 2003–2005. Second revised version. The report said that the exclusion zone has “paradoxically become a unique sanctuary for biodiversity.”; ‘Will Flanary (Lead Author); Mark McGinley (Contributing Author); “Environmental effects of the Chernobyl accident”. In: Encyclopedia of Earth. Eds. Cutler J. Cleveland (Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment). [First published in the Encyclopedia of Earth December 15, 2008; Last revised Date February 19, 2013; Retrieved March 25, 2013 <http://www.eoearth.org/article/Environmental_effects_of_the_Chernobyl_accident>

Ecological Network. Ukraine has been in the process of developing a biosphere reserve plan for all of ChEZ, but formalization of the plans has been delayed due to political and military unrest.

2.2 Global significance

46. The combination of three main factors in the exclusion zone makes this area a unique area in the world for nature conservation and research:

1. Radionuclide contamination as a result of the accident;
2. The potential for what could become the largest area in Europe without anthropogenic impact, and one that contains substantial and increasing species, ecosystem and landscape diversity of global significance; and
3. Provides opportunity for maintaining and achieving substantial levels of carbon sequestration given its substantial forest base and peatland areas.

Radionuclide contamination study

47. The ChEZ will retain the status of radiation-hazardous area long into the future, and as such it will continue to be subject of a continuous radiation monitoring program to inform other areas of the world that have or in future will suffer nuclear accidents. Continued research and monitoring will provide the necessary basis to improve currently limited understanding the underlying natural recovery process that is taking place in the ChEZ ecosystem, and this research will not only assist in determination of future prospects for the conservation and development of the area, but as a laboratory for informing similar research globally in the future.

Species and general ecosystem diversity

48. The ChEZ has now become globally significant for reasons other than it having been the site of the first major nuclear accident. As a result the long absence of human influence, expert assessments indicate that flora and fauna diversity and abundance has increased to levels that have not existed in the zone for centuries¹¹. In particular:

- Over 320 species of vertebrates (out of the 410 likely to occur in the area) have now been recorded in the ChEZ, of which 55 species (out of 97 possible) are on the "Red List" of Ukraine¹².
- Populations of ungulates, carnivores, and other game species are currently at the highest level ever recorded. For example, Lynx, Otter, and Beaver populations have significantly increased. The density and abundance of Moose in the ChEZ is the highest in Ukraine, despite a substantial Wolf population. And the Red Deer, Wild Boar, and Roe Deer populations have also substantially increased.
- The White-Tailed Eagle, Spotted Eagle, Black Stork, Gray Crane, Eagle Owl, and many other rare birds are now widespread within ChEZ. Bats (*Chiroptera*) are represented by 14 species, including the Pond Bat, Barbastelle Bat, and Greater Noctule, that are rarely seen in Europe.
- The ChEZ is also located at the intersection of several main flyways for several populations of migratory birds in the African Eurasian Region¹³, thus playing a significant role in supporting these populations of birds in their seasonal migration cycles.
- Over 1500 species of lichens, mosses, and higher plants have been recorded in the ChEZ. Many of these are also red-listed, regionally endemic, or relict.

¹¹ While there is disagreement on whether species diversity, for certain species such as barn swallows, would be greater than at present in the absence of radioactive contamination, there is no disagreement that current levels and richness of biodiversity is greater than it has been in centuries.

¹² The Red List of Ukraine separates species into the following categories: Totally extinct; Extinct in nature; critically endangered; vulnerable; rare; not estimated; insufficiently assessed. The Red List definitions do not coincide with those of the IUCN.

¹³ Such as the Great Bittern, White-winged Tern, Black Tern, Common Crane, Water Rail, etc. Available at: <http://csntool.wingsoverwetlands.org/csn/default.html#state=site&SiteRecID=2073>

- The sudden halt of agricultural and forestry activity has contributed to the recovery of all fauna.
- The population of pollinating insects also appears to have been enriched.

49. As previously stated, local habitat diversity is classified into 23 different terrestrial and 7 aquatic phyto-systems, 12 terrestrial and 8 aquatic zoo-systems, five landscape types and up to 15 soil types.

50. The current ChEZ (2,600 sq. km.), together with the Polessky State Radiation Ecological Reserve in Belarus, forms a natural and geographical system with a total area of 4,750 sq km. The “Drevlyansky” Nature Reserve (308.73 sq. km.), established in 2008 in the adjoining territory of the Zhytomir region of Ukraine, makes possible consideration of a vast Protected Area Network in and around the ChEZ with a combined area of over 5,000 sq. km.

51. This vast territory increasingly provides a safe habitat for viable populations of species with a limited range that are sensitive to anthropogenic impacts, as well as for species that require large territorial ranges to survive. For example, the Brown Bear, which had disappeared from this landscape, and requires a large territorial range, has reappeared in the ChEZ. Other examples include the now thriving population of the re-introduced Pretzwalsky Horse and increasing numbers of European Bison in neighboring Belarus.

Carbon sequestration in the ChEZ

52. Termination of land use in the ChEZ contributed to the formation of permanent vegetation cover, leading to stabilization of the hydrological regime, reduced wind and water erosion, and minimization of the migration of radionuclides with water flows out of initial deposition pools. Thus, the maintenance of reserve status of the area increases the effectiveness of the barrier function of the zone, which corresponds to the requirements of the Law of Ukraine (1991). The Law describes the legal activities that may take place in all zones of Ukraine, and emphasizes the requirement to maintain the barrier function of the ChEZ as a means of preventing redistribution (disturbance) of existing radionuclides in and outside of the zone.

53. Increased levels of carbon sequestration by vegetation complexes throughout the area is an important additional positive process in the ChEZ that has global significance. Intensive accumulation and concentration of carbon takes place in an area of more than 60 thousand hectares of former agricultural lands, where stable cover of perennial grasses has now formed. In areas close to massive forests, perennial herbs have been intensively replaced by natural regeneration of pine and birch trees, whose age ranges from 5 to more years. The typical succession process of grasslands in the temperate climatic zone, where the ChEZ is situated, comprises complex, multispecies indigenous forests within a 10-15 year period, with consequent high carbon sequestration. This process of accumulation and concentration is currently underway in the zone as evidenced by substantial increases in pine and birch on former agricultural lands. At present lands within the ChEZ are unmanaged in the national CHG inventory.

2.3 Threats, root causes and barrier analysis

54. The principal threats to biodiversity and other values in the ChEZ, and their root causes, include:

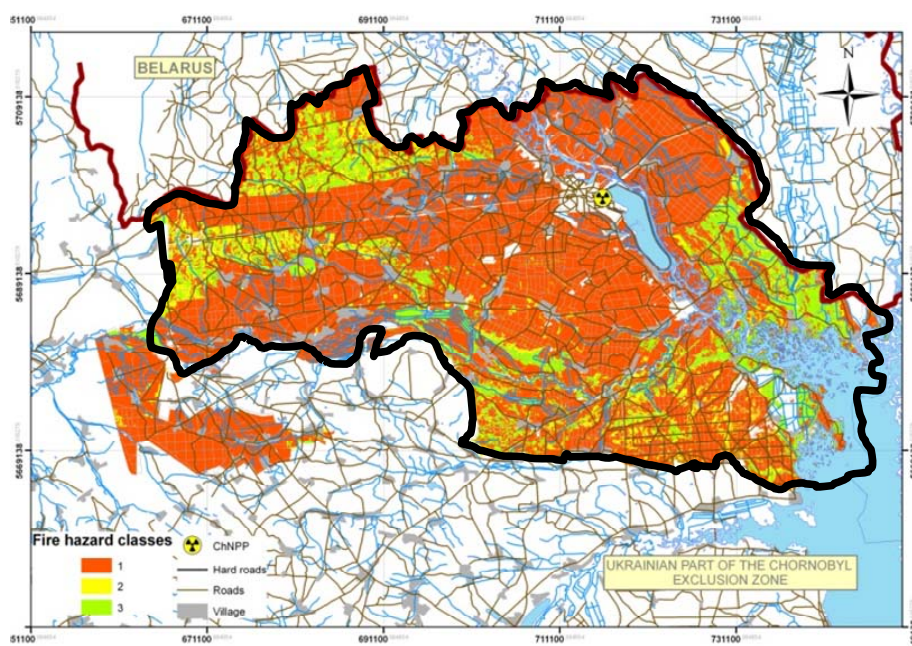
1. Human induced and naturally occurring wildfires;
2. Limited information on ecosystem health and natural recovery processes occurring in the ChEZ;
3. Unauthorized human access, unauthorized and illegal harvesting of natural resources;
4. Lack of human and financial resources;
5. Lack of adequate legislation – i.e. explicitly identifying biodiversity conservation, nature conservation and carbon sequestration as new principal objectives for the ChEZ; and

6. Managing competing demands - general lack planning for biodiversity protection, climate change mitigation and land degradation: the potential for inadequate policies that lead to a diminution of ChEZ natural resources at the expense of extant and growing amount of biodiversity.

i. Human induced and naturally occurring wildfires

55. The greatest and well-documented threat to biodiversity and to the sustainable management of natural resources in the ChEZ (including the enhancement of existing carbon stocks) is represented by forest fires, in the context of continuing degradation of Scotch Pine plantation forests (Zibtsev, 2006a; Zibtsev, 2006b; Prof. S. Zibtsev, *pers. comm.* 2013 Zibtsev, 2007; Zibtsev, Brunello, Othman, Hutton, Hao, 2007; Oliver et al. 2009; Gilitukha, Zibtsev, Borsuk, 2011; Zibtsev, Petrenko, Gavrilej, 2012; Hohl, Oliver, Melnychuk, Zibtsev et al., 2012). Forest fires destroy the very important 'barrier' function of forests in the ChEZ, and thus stimulate migration of radionuclides into ground water and into the atmosphere (Zibtsev, 2005). Figure 4 below depicts the fire prone areas of the ChEZ.

Figure 4: Fire prone areas of the ChEZ



56. At present there are 176.6 thousand hectares of grass and forestlands in the ChEZ that are classified as Class I fire hazard, the highest risk rating. Another 15.8 thousand hectares are labeled Class II. In both of these categories there is high risk of ground and crown wildfires during all fire seasons. Most of the fire prone forest is comprised of 60-70 year old Scotch pine (*Pinus sylvestris* L.). The ChEZ is largely situated on droughty glacial outwash, characterized by seasonal droughts, and is overly crowded and insect and pathogen infested thus making it highly susceptible to wildfires.

57. Radioactive fallout was deposited on plant surfaces during the first month after the disaster—especially on Scotch Pine since deciduous plants had not yet produced spring foliage. Within 3–4 months, most of the radionuclides had migrated into the ground, accumulating in mosses, forest litter, and soils. The vegetation root systems gradually absorbed the radionuclides in isotope-specific amounts. Within 3–4 years, a period of quasi equilibrium of radionuclides in the ground and vegetation cover occurred and has continued. At the moment, the concentration of each radioactive element varies considerably among the different components of vegetation. Strontium 90 (^{90}Sr), Cesium 137 (^{137}Cs), plutonium 238 (^{238}Pu), and $^{239+240}\text{Pu}$ are concentrated mostly in topsoil layers of forests and grasslands (Yoschenko et al. 2006). The radioactivity content of litter is higher than that in living tree foliage, bark, or grasses.

58. Resuspension of ^{90}Sr , ^{137}Cs , ^{238}Pu , and $^{239+240}\text{Pu}$ into the atmosphere is occurring in two ways: smoke particles and mineral dust. Construction activity in the Chernobyl nuclear power plant site and windy conditions are the major causes of dust from contaminated soil. Dust particles are usually large (range: 2–100 μm in diameter, mean: $\sim 10 \mu\text{m}$) (Brasseur et al. 1999) and redeposit close to the source. In contrast, forest and grassland fires emit fine particles with a bimodal size distribution of 0.04–0.07 μm and 0.1–0.3 μm . While large particles are usually repelled by the respiratory system, fine particles are inhaled into the lungs. Fine particles in smoke plumes often form large particles in aged plumes through coagulation deposited with cloud droplets downwind from the fires.

59. Radioactivity of ^{90}Sr , ^{137}Cs , ^{238}Pu , and $^{239+240}\text{Pu}$ for atmospheric particulate matter near an experimental forest fire and two grassland fires in the ChEZ were found to be several orders of magnitude higher than ambient levels (Yoschenko et al. 2006). The emitted radionuclides, especially plutonium, were concentrated in fine particles, which would increase the inhalation dosage to firefighters.

60. Insufficient forest management has allowed the accumulation of fuel in forest stands and a decline of forest health. Forest inventory data shows 15.3 thousand hectares of forest are damaged, including 5.3 thousand hectares damaged by pests that are now extremely fire prone. Large areas of Scotch Pine plantations have already died from insect infestation and disease (mostly *Dendrolimus pini* L., *Fomitopsis annosa* Karst.). An estimated 1 to 2 million cubic meters of dead radioactively contaminated wood has accumulated in forests of the ChEZ (data from the Ukrainian Forest Inventory Enterprise). Contaminated machines and buried radioactive waste are also found within the forests in the 10-km zone around the nuclear plants.

61. Over 1000 fires were registered in ChEZ during the period 1993-2011. Fires are most frequent in grasslands (55%) and forests (33%), but even occur in swamps during periods of drought. Forest fires have recently been increasing due to increasing legal and illegal visits to the ChEZ (adventure tourists and illegal hunters and food gatherers), and especially in spring, a time of high fire hazard, as samosely prepare small garden plots for replanting.

62. In the high drought year of 1992, more than 17,000 hectares of forest were totally destroyed by fire, or experienced crown fires. While there was a declining trend in numbers and sizes of fires since 1992, coincident with improved firefighting efforts, the past few years have seen increases in drought conditions and a consequent rise in incidence of forest fires. It is safe to assume that fires will continue to increase during drought years and that catastrophic fires are possible and likely inevitable.

63. Following catastrophic wildfires in 1992, the specialized Chernobyl Forestry Enterprise was established to carry out fire and forest management to prevent large concentrations of radionuclides from migrating out of the ChEZ. However, only 6% to 10% of the planned thinning operations took place during 1993-2010 due to restrictions related to radioactive contamination and labor and finance shortages. These shortages continue, and there is a high risk of mega-fires in ChEZ, especially in the July-August period, two of the driest months of the year, and as occurred in 1992. Fires in relatively nearby and similar areas in Russia in the hot late summer of 2010 and again in 2012 are also illustrative of not only the danger of large fires, but of their inevitability.

64. A sample of 27,000 hectares of the ChEZ was assessed for current and future potential fire risk, using Ukrainian forest inventory and application of the Landscape Management System (LMS) computer platform (Oliver et al. 2009), which used both Ukrainian and United States forest fire risk assessments. Using the LMS, the United States Lake States variant of the Forest Vegetation Simulator growth model, and the U.S. fire risk classification, current conditions of the stands and their projected changes with and without silvicultural intervention were compared. Both the Ukrainian and U.S. fire risk assessments confirmed initial observations that much of the forest is in high danger of burning. Projections with and without silvicultural manipulations confirmed that the fire risk would remain high without intervention, but could be reduced dramatically with appropriate silvicultural manipulations.

65. This catastrophic scenario analysis was based primarily on a generic screening model used to assess the impact of discharges of radioactive substances to the environment (IAEA 2001). It assumed that the 70% of the ChEZ classified as deforested/former agricultural areas or pine forests would burn. The analysis indicated that the greatest effects would be on people working within or near the CEZ

and to crop areas that were exposed strongly to the radioactive smoke as far as 150 km and more away. These crop areas directly in the smoke's path would become too contaminated to grow food for consumption.

66. The highest risk is to the forest fire brigades responsible for the initial attack on the fire. A catastrophic crown fire could also give serious exposure to the professional staff of 2,000-3,000 who are working on the failed ChNPP and elsewhere in the ChEZ. High risk exists also for people living outside of the ChEZ. Fires in Ukraine that may send smoke or burn into Belarus (or in the opposite direction) would require special agreements between the governments to exchange of information and to permit fire fighters to cross the border.

67. The effects on people of smoke from a catastrophic fire in the ChEZ was analyzed by assuming a worst case scenario, in which all of ChEZ forests were completely burned and the airborne smoke and particulate matter was blown directly toward Kiev, 100 km away, for 90% of the time. The model was developed as a cooperative effort among the National University of Life and Environmental Sciences of Ukraine, the Global Institute of Sustainable Forestry of the Yale University School of Forestry and Environmental Studies, and the Global Fire Monitoring Center of the United Nations and Freiburg University with financial support by the Chopivsky Family Foundation (Hohl, Oliver, Melnychuk, Zibtsev et al., 2012).

68. In summary, the issue is not whether there will be continuing human induced and naturally occurring wildfires in the ChEZ, but rather how many there will be, their severity, and the extent of health risk posed to workers in the general area, others who may be in the proximity of the wildfires, and areas outside of the ChEZ and other countries, depending on wind direction and overall weather patterns. There is also a danger that severe fires in the ChEZ could have a negative effect on crops, with sufficient radioactive contamination of foodstuffs to render them unfit for human consumption.

ii. Unauthorized human access and resource extraction

69. As previously described, unauthorized access to the ChEZ has been occurring and seems to be increasing. Illegal activities taking place include those related to illegal logging and timber sales, hunting, and the illegal use of other natural resources within the zone. Lack of personnel to monitor and enforce existing laws within the zone, described in more detail below, is a constraint on current efforts to enforce existing provisions and will continue to be a constraint in future.

*iii. Loss of globally important biodiversity and diminishment of extent of carbon trapping forests and grasslands
Exploitation of natural resources with consequent loss of globally important biodiversity and
diminishment of carbon trapping forests and grasslands*

70. The current lack of understanding and/or neglect of ecosystem knowledge and practices, and the failure to incorporate sustainable development and conservation based principles and practices into economic planning and development can and often does lead to unsustainable levels of resource exploitation and diminishment of important carbon-trapping forests and grassland areas. Lack of understanding of the inter-relationship between existing and evolving areas of forests and other lands within the zone and globally important biodiversity can and often does place such biodiversity at risk.

71. Under current conditions (institutional, personnel, legislative, policy) there is no clear priority given to biodiversity support and nature conservation for the ChEZ, no management plan for nature protection and carbon sequestration. For example, at present there is no scientific evidence on how logging, that is apparently being planned for some areas within the ChEZ, would impact biodiversity and ecosystem values. As a consequence, harvesters will target mature and over mature stands, stands that also have the highest species and genetic diversity and thus should be candidates for protected area status. It is also unclear how logging operations will impact the 'barrier' function of forests that

minimize migration of radionuclides beyond areas of initial deposition, impact carbon fluxes, and how migration could affect valuable habitat and “red book” species preservation.

72. In addition to the illegal and unauthorized use of natural resources occurring in the ChEZ, There is a general lack of human and financial resources to effectively manage, monitor, and enforce rules that would govern an expanded, or even existing protected area within the ChEZ. The current ratio of forested area within the ChEZ, in relation to non-forested area, is a ratio of 5-15 times greater than is found elsewhere in Ukraine. At present there are insufficient resources to manage that area. As an example:

- At present there is 1 forest worker per 1000 ha of forest land in ChEZ, while outside of ChEZ there are 7-8 workers per 1000 ha;
- Forest workers that are deployed to the ChEZ generally are not skilled in matters related to conservation practices and management of protected areas; and
- There are insufficient vehicles and budgets for vehicle fuel and maintenance.

73. Lack of adequate legislation regarding ChEZ natural resource use adds to the threat of over-exploitation. Currently there is no formal legislative document that describes the mid- and long-term strategy for the development of territories in ChEZ, aims of and targets for ecosystem management, and no vision of how to reach better balance between land use, rehabilitation and protection of ecosystems. Existing legislative frameworks are focused on nuclear safety of the "Shelter", the prevention of migration of radionuclides outside the ChEZ, and radioecological monitoring and fire safety in the area. As more ChEZ land becomes suitable for a broader range of uses, competing demands will have to be addressed by updated legislation which, in turn, can be aided by the scientific and assessment work that is the subject of this project proposal.

iv. Exposure to radioactive contamination in the ChEZ and in areas abutting the ChEZ

74. Poverty in areas abutting the ChEZ make harvesting the resources within it, and reestablishing residency in the zone appealing, notwithstanding the dangers inherent in these activities due to increased exposures to radioactive materials. Further, recent discussions of timber harvesting within the zone will necessitate more stringent enforcement of existing rules for dwellings, tourism and other activities.

75. There is very limited information about current state of ecosystems, productivity, and forest health. Most information comes from episodic research by different teams. For example, the last assessment of forest health on most territories of ChEZ was done in 1997, and the last forest inventory was done in 2006 – but some figures, for example relative density of forests and growing stock of forests in ChEZ, should be further validated. In 2008, the IAEA published a study of the environmental consequences of the accident, drawing on the experience accumulated over more than 20 years that had elapsed since, providing a useful, but rather brief overview of the effects on forest ecosystems. The study found there was a need for continued, but more targeted monitoring of the agricultural, forest, and aquatic environments, and for further research in some specific areas, such as targeted monitoring of forest ecosystems.¹⁴ In 2010, a group of experts published a study on Chernobyl's environmental consequences, but the study, as the majority of others¹⁵, focused more on the impact of the accident on human health rather than ecosystem effects.¹⁶ WHO, IAEA, UNDP, UNEP, and other

¹⁴ Environmental Consequences of the Chernobyl Accident and their Remediation: Twenty Years of Experience'. Report of the Chernobyl Forum Expert Group 'Environment'. IAEA, Vienna, 2006-2008.

¹⁵ Jim Smith, Nicholas A. Beresford: 'Chernobyl, Catastrophe and Consequences' UK, 2005; [Goldman, M.](#); [Catlin, R.J.](#); [Anspaugh, L.](#): 'Health and environmental consequences of the Chernobyl nuclear power plant accident', 1987; [Dreicer, M.](#); [Aarkog, A.](#); [Anspaugh, L.](#); [Arkhipov, N.P.](#).

¹⁶ Yablokov, A.V., Nesterenko, Vassily B., and Nesterenko, A. V.: 'Chernobyl Consequences of the Catastrophe for People and the Environment'. Annals of the New York Academy of Sciences. Volume 1181, Boston, Massachusetts, 2009.

agencies, that also briefly dealt with ecosystem effects of the accident, conducted significant scientific research jointly.¹⁷

76. The following table presents a summary of the threats, root causes and barrier analysis for the project. The ultimate causes are beyond the scope of the project, while the intermediate causes will be addressed to varying degrees during project implementation through project-supplied finance and country co-finance.

Table 2. Summary threats, root causes and barrier analysis

Threats	Root Causes	Barrier Analysis
Human induced wildfires in the ChEZ	<u>Ultimate Cause:</u> Poverty in areas abutting the ChEZ <u>Intermediate Causes:</u> Poor enforcement of existing rules preventing rehabilitation of dwellings within the ChEZ Poor enforcement of existing restrictions on unauthorized tourist access to the ChEZ Illegal logging activities Poaching Illegal “adventure” tourism Absence of integrated resource management for the ChEZ	Lack of knowledge of dangers to exposure (through smoke inhalation and less visible atmospheric deposition) of radioactive material resulting from combustion of organic material Lack of resources, human and financial, to strengthen and enforce existing regulations Lack of resources, human and financial, to strengthen and enforce existing regulations Lack of integrated resource planning in the ChEZ
Naturally occurring wildfires in the ChEZ	<u>Ultimate Cause:</u> Lightning strikes and drought conditions (possible climate change effect)	Lack of effective fire monitoring and fire response mechanisms within the ChEZ

¹⁷ ‘Chernobyl’s Legacy: Health, Environmental and Socio-economic Impacts and Recommendations to the Governments of Belarus, the Russian Federation and Ukraine’ The Chernobyl Forum: 2003–2005. Second revised version.

<p>Exploitation of natural resources inconsistent with conservation based principles</p>	<p><u>Ultimate Causes:</u> Poor understanding and/or neglect of ecosystem knowledge and practices w/ consequent loss of globally important biodiversity and diminishment of extent of carbon trapping forests and grasslands</p> <p>Exclusive value placed on development to the exclusion of conservation based principles and understanding of ecosystem services</p> <p><u>Intermediate Causes:</u> Failure to incorporate sustainable development and conservation based principles and practices into economic planning and development</p> <p>Failure to include local communities in planning future ChEZ use</p>	<p>Lack of integrated research that can lead to identification and quantification of ecosystem derived benefits and services</p> <p>Poor integration of ministerial responsibilities and effort</p> <p>No existing analysis of benefits that could be derived through employment and other benefits of PA creation</p> <p>Little emphasis on effective stakeholder involvement activities</p> <p>Lack of integration of various relevant activities among ministries and between national ministries and local governments and populations</p> <p>Lack of human and financial resources to create and enforce provisions ensuring integrated resource management (cross-cutting)</p>
<p>Continuing and growing unauthorized human movement into, and illegal use of resources (e.g. illegal logging, poaching) within, the ChEZ</p>	<p><u>Ultimate Cause:</u> Poverty in areas abutting the zone</p> <p><u>Intermediate Causes:</u> Poor enforcement of existing rules preventing re-inhabiting of dwellings within the ChEZ</p> <p>Poor enforcement of existing restrictions on unauthorized tourist access to the ChEZ</p>	<p>Lack of economic opportunity in areas immediately outside of the ChEZ</p> <p>Rules and regulations for access to the ChEZ do not adequately make provision for stakeholder access consistent with clear and understandable access rules of integrated resource management</p>
<p>Exposure to radioactive contamination in the ChEZ and in areas abutting the ChEZ</p>	<p><u>Ultimate Cause:</u> The Chernobyl disaster</p> <p><u>Intermediate Causes:</u> Low level of understanding, or ignoring understood dangers that radioactive contamination released from harvesting of forests poses to workers and inhabitants in, and in the vicinity of, the ChEZ</p> <p>Poor enforcement of existing rules, and the formulation of improved regulations aimed at preventing practices that would increase levels of radioactive contamination</p>	<p>Lack of economic opportunity in areas immediately outside of the ChEZ, leading to illegal burning and poaching</p> <p>Lack of knowledge of dangers to exposure (through smoke inhalation and less visible atmospheric deposition) of radioactive material resulting from combustion of organic material</p> <p>Lack of resources, human and financial, to strengthen and enforce existing and future regulations</p>

2.4 Institutional, sectoral and policy context

National Policy Context

77. Biodiversity conservation and enlargement of the protected areas is one of the key priorities of *National Action Plan for Environmental Protection for 2011-2015* (Plan) approved by the Order of the Cabinet of Ministers of Ukraine on May 25th 2011 № 577. Objective 5 of the Plan is to “Stop the loss of biological and landscape diversity and establishment of an environmental network” and includes such activities as, among others:

- Development of new, and expansion of existing terrestrial and marine protected areas;
- Establishment and management of national parks, nature and biosphere reserves and botanical gardens; and
- Definition, before 2020, of the scope and size of a representative and interlinked nature reserve system shall be established. The total area of the reserves shall reach at least 17% of dryland and inland waters, and 10% of the coast and seawater territories.

78. Ukraine is a signatory to, and has ratified all three main relevant conventions pertaining to the activities envisaged in this project: the Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC), and the United Nations Convention to Combat Desertification (UNCCD). The expected outcomes of the project – specifically the promotion of long-term sustainable land use practices in the ChEZ - will contribute directly to meeting Ukraine’s commitments under the above conventions, and will also be in full conformity with the guidelines expressed in the “Principal Directions for Land Policy, Requirements of Land Conservation, Sustainable Use and Restoration” of Ukraine.

79. The main goals identified in the National Biodiversity Strategies and Action Plans (NBSAPs) (2010), all supported by the present project, include:

- 1) Conservation, improvement and restoration of natural and disturbed ecosystems, landscape components, and habitats of some species;
- 2) Promotion of a transition to sustainable, well-balanced use of natural resources;
- 3) Minimization of any indirect negative influences on ecosystems, their components and ecological complexes;
- 4) Strengthening of public awareness, improving availability of information on biodiversity, involving more of local population in conservation activities; and
- 5) Definition and strengthening of responsibility for biodiversity conservation, especially related to institutions, organizations, land users, companies and individuals that use or affect natural resources.

80. To achieve these goals, several measures are identified. These include the development of national ecological networks (a system of “green corridors”) as a constituent part of the EECONET (European Econet). Ukraine’s National EcoNetwork Formation Program for the years 2000-2015 (Law of Ukraine, 2000) was developed in the context of requirements of:

- The Convention on Biodiversity;
- The Bern Convention; and
- Further refinement and development of the Pan-European Biological and Landscape Diversity Strategy (PEBLDS) in respect of the development of a Pan-European EcoNetwork.

81. The principal objective of the EcoNetwork Formation Program is to increase the country’s area under natural landscapes to a level sufficient for the preservation of their diversity, as close as feasible to their initial natural condition, and the development of a territorially integrated system. The system would be built to ensure the possibility for species of plants and animals to use natural migration and propagation, which would ensure the preservation of natural ecosystems, species and populations of flora and fauna.

82. Ukraine has adopted several other nature conservation programs and legal documents directed at biodiversity conservation and sustainable land management. Ukraine's commitments under several of these programs will be directly supported by the present project, and include, among others:

- Econet (2000);
- The "Forests of Ukraine" Program (2002);
- Law on Econet (2004);
- Law on Red Data Book (2002);
- The series of Ministry of Ecology and Natural Resources Decrees on limits of use of animal and plant species;
- The Decree of the Cabinet of the Ministers on the Strategy of Sustainable Development of the Carpathians (2006);
- Resolution of the Cabinet of the Ministers on the Cadastre of Plant Species (2006);
- Decree of the Cabinet of the Ministers on the Concept of the State Program on Protected Areas to the Year 2020 (2006); and
- Law on Protected Areas of Ukraine.

Regional and Global Context

83. Ukraine has also ratified a number of selected treaties in the field of biodiversity conservation including:

- The European Landscape Convention (2005);
- Convention on Migratory Species (CMS, 1999);
- The African-Eurasian Waterbird Agreement (AEWA, 2002); and
- The Framework Convention on the Protection and Sustainable Development of the Carpathians (2004).

84. In addition, Ukraine is a member of the Emerald Network, and is participating in the Joint Program titled "*Support for the implementation of the Convention on biological diversity program of work on protected areas in the EU Neighborhood policy East area and Russia: extension of the implementation of the EU's NATURA 2000 principles through the Emerald Network*".

85. The Joint Program provides assistance to seven target countries (Armenia, Azerbaijan, Belarus, Georgia, Moldova, the Russian Federation and Ukraine) in assessing their natural resources, in identifying species and habitats to protect and in selecting the potential sites suitable for ensuring the long-term survival of the species protected by the Bern Convention. The overall goal of the Joint Program is to protect biodiversity in the seven EU Neighborhood Partnership Instrument (ENPI) countries and more precisely to implement the Convention on Biological Diversity and its program of work on protected areas, as well as the EU's principles and the Bern Convention concerning the protection of habitats and species. The present project will provide a significant contribution to this element of the NBSAP through the establishment of a new, large protected area and through building national capacity for the participatory development of PA Management Plans, for replication in other parts of the country.

86. Other relevant agreements endorsed by Ukraine, and other relevant activities include:

- Ratification of the Kyoto Protocol in 2004 as an Annex I party. Ukraine has a total forest cover of 10,5 million ha (~ 17 % of the territory). The project will directly contribute to the continued conservation and sustainable management practices for over 110,000ha of protected forest, as well as additional areas of other habitats (i.e. wetlands and marshlands, including peatlands) that are contribute significantly to Climate Change mitigation by acting as natural carbon sinks.

- *The milestone BioCarbon Fund Feasibility Study* (Study) conducted by the World Bank and State Committee for Forests of Ukraine in 2003, the objective of which was “to reconstruct, maintain and manage natural pine and beech forest on approximately 15,000 hectares of abandoned agricultural lands in the vicinity of Chernobyl in order to re-establish forestry as the most economically productive land use for the area, and also sequester Kyoto-compliant carbon from the atmosphere.”

87. *The Forest Europe Process*. Ministers, at the conclusion of the 2011 in the recently concluded Ministerial Conference for the Protection of Forests in Europe agreed to embark on negotiations for the development of a legally binding agreement on forests in the pan European region. Ukraine as one of the 8 bureau members, has agreed to 2020 targets including agreement that:

“All European countries include strategies for forests and climate change adaptation and mitigation in national forest programs or equivalents and all other relevant national strategies; the rate of loss of forest biodiversity at habitat level is at least halved and where feasible brought close to zero, and measures are taken to significantly reduce forest fragmentation and degradation and to restore degraded forests; the role of forests in combating desertification is fully recognized and forests are also managed to that end.”

Institutional Context

88. The State Agency for the ChEZ has exclusive control of matters related to the ChEZ and, until very recently, was under the aegis of the Ministry of Emergencies. However, responsibility for the Agency has been shifted to the Ministry of Ecology and Natural Resources, making that agency also a centrally important to future activities that will be undertaken within the zone. While other government ministries agencies of government will be involved during project implementation, they are not involved in official decision-making. Ministries and agencies that will be involved in project activities include, among others, the State Ecological Academy (SEA), the State Environmental Investment Agency, the State Forestry Resources Agency, officials from the adjoining Drevliansky Nature Reserve, the Kiev oblast State Administration, the Zhytomyr oblast State Administration, and the Academy of Sciences of Ukraine. Descriptions of the responsibilities and potential areas of involvement in project activities appear in the table below under Stakeholder Mapping.

89. The project is consistent with the following areas of UNEP’s mandate in the GEF (as identified in the UNEP Action Plan on Complementarity, approved in May 1999 by the GEF Council):

- UNEP’s mandate is to coordinate the work of the UN in the area of environment. Its projects promote regional and multi-country cooperation to achieve global environmental benefits, focusing on diagnostic analyses and cooperative mechanisms, and associated institutional strengthening.
- UNEP’s contribution to the ability of the GEF and of countries to make informed strategic and operational decisions on scientific and technical issues in programs and project design, implementation and evaluation, through scientific and technical analyses. These include assessments, targeted research, methodology development and testing and structured program learning projects.
UNEP’s implementation of projects to promote specific technologies and demonstrate methodologies and policy tools that can be replicated on a larger scale by other partners.
- The project is consistent with the UNEP Midterm Strategy (MTS) for 2014-2017 and the biennial Programme of Work (PoW) for 2014-2015. In particular, the project will contribute to

the achievement of the PoW Expected Accomplishments (a)¹⁸ under the Ecosystem Management subprogramme and Expected Accomplishment and (a)¹⁹ Environmental Governance subprogramme.

2.5 Stakeholder mapping and analysis

90. The project is unique in that there has been no permanent population living in the ChEZ over the past twenty-seven years (since the nuclear accident), and there is no projected date on which there will be allowable population within the zone. However, the project is of significant importance for several groups of stakeholders:

- A wide array of government Ministries and Agencies, including, among others, the Ministry of Ecology and Natural resources, the Agency for Management of the Exclusion Zone, and the Chernobyl Center;
- Day workers operating within the exclusion zone;
- Populations living around the exclusion zone; who i.e. would be adversely affected by forest fires in the zone, transfer of radioactivity from the zone, adversely affected by ingesting contaminated crops illegally harvested within the zone, etc.;
- The academic community: as described throughout this project document, the extent of effort required to collect, synthesize and undertake a gap analysis of existing, targeted scientific research, and the conduct of research to fill identified gaps will require focused attention on the involvement of appropriate scientific personnel within Ukraine and internationally;
- The global community including governments and international research organizations with a focus on nuclear accidents and remediation of nuclear contaminated areas; and
- Ukrainian and international NGOs such as Mama86 and other Ukraine-based groups, and international NGOs such as the World Wildlife Fund (WWF), Wetlands International, and Birdlife.

91. As there are no legal residents within the zone, and thus no municipal governments, that level of governance does not exist as a stakeholder. There are, however, stakeholders at local (abutting the zone), national, and international levels as presented in the following table:

Table 3. Stakeholder Mapping

Organization	Responsibility	Role in the project
GOVERNMENT:		
Community level governance structures in surrounding areas (and formerly resident within the ChEZ)	Support for the activities and outcomes of the project during and post implementation	Important participants in/beneficiary of project outcomes and outputs
Ministry of Ecology and Natural Resources (Kyiv)	Overall responsibility for nature reserves, biodiversity conservation etc. at the national level	Lead Government Executing agency for the GEF project (Chair of project Steering Committee)
– State Agency for ChEZ (Kyiv, Chernobyl)	Full responsibility for the zone: radioactive waste management; forest management; management of waterways and flood plains; monitoring of radioactivity	Key project executing partner given its historical role as controlling all issues related to the ChEZ (Steering Committee member)
– Chernobyl Center for Nuclear Safety, Radioactive Waste and	Investigation of radioactive safety of various objects and ecosystems of the zone	Belongs to the State Agency for ChEZ (see above) – is preliminarily identified as possibly

¹⁸Use of the ecosystem approach in countries to maintain ecosystem services and sustainable productivity of terrestrial and aquatic systems is increased. Ibid.

Radioecology (Chernobyl Center) (Slavutych, Kyiv oblast)		evolving into the Environmental Resource Center envisioned in project design (Steering Committee member)
– State Environmental Investment Agency	Responsible for all carbon and Kyoto protocol related activities in Ukraine	Possible project partner in terms of demonstration and reporting of carbon-related benefits (Steering Committee member)
– Drevliansky Nature Reserve (Narodychi district of Zhytomyr oblast);	Maintaining protected area contaminated by the Chernobyl fallouts	Sharing expertise, coordination and joint activities (member of Technical Advisory Group)
State Forestry Resources Agency	Formulates the state policy in forestry, responsible for management of forests (but not in the zone)	Coordination of activities and sharing of expertise on forest management to support project activities in the project area (Steering Committee member)
Kyiv oblast State Administration	Responsible for land use and economic activities in Kyiv oblast	Coordination with project team on land-use and economic development activities in the project area (member of Stakeholder Advisory Group)
– Kyiv oblast Department for Environmental Protection (Kyiv)	Environmental control of land allocation and use in the oblast, issuing permits etc.	Environmental control of land allocation and use in the oblast, issuing permits
– Slavutych City State Administration (Slavutych)	The city where majority of people working in the 30-km zone live	Potential project partner, as the planned nature reserve will create job opportunities for city inhabitants (member of Stakeholder Advisory Group)
Zhytomyr oblast State Administration	Lands adjacent to the 30-zone (Narodytsky Rayon and Ovrutsky rayon)	Coordination with project team on land-use and economic development activities in the 30-km zone and outside the zone project area; member of Stakeholder Advisory Group)
ACADEMIA		
State Ecological Academy (SEA)	Provider of ecological knowledge and assessment	Source of ecological expertise and other project services
Academy of Sciences of Ukraine and it's Institutes (of plant physiology and genetics; zoology; botanic; molecular biology)	Coordination of research activities, allocation of funding for research programs	Advisory capacity to the project, coordination of research activities with possible financial support (member of the Project Steering Committee)
Institute of Agricultural Radiology of the National University of Life and Environmental Sciences (Kyiv)	Research at agricultural and forest lands impacted by Chernobyl radioactive fallout	Expertise, contribution to the design and establishment of the planned nature reserve (member of Technical Advisory Group)
Zhytomyr Agroecological University (Zhytomyr)	Among other tasks, field investigations in areas contaminated by Chernobyl fallouts	Expertise, contribution to the design and establishment of the planned nature reserve (member of Technical Advisory Group)
Institute of Forestry and Forest Melioration (Kharkiv);	All issues related to forestry	Information on the forest resources within the ChEZ and continuing provision of expertise (member of Technical Advisory Group)

INTERNATIONAL ORGANIZATIONS:		
UNEP	Implementation of the project	GEF Implementing Agency. Overall project oversight and supervision (represents the GEF in the project Steering Committee); provision of technical support and specific support to project execution if/as appropriate.
UNDP	Historical, extensive, and ongoing socio-economic work within the ChEZ	Collaboration and ongoing coordination with UNEP and national government agencies involved in the project; assistance/support in project execution and in-country administration of GEF funds in support of government agencies
The World Bank	History of Chernobyl involvement including afforestation carbon project (Biocarbon Fund)	Sharing of technical experience from prior and ongoing afforestation programs.
EU	Technical support for fire protection in the 30-km zone; ongoing assistance to the Ukraine on efforts to increase the number and extent of protected areas nationally	Existing and potential future donor; sharing expertise
Yale University	History of Chernobyl involvement and interest in forestry issues and fire control issues within ChEZ	Involved during preparation and ongoing technical partnership with national agencies and academic institutions during project execution, focusing on wildfire management and forestry issues
U.S. Forest Service	Involvement in fire prevention strategies for the ChEZ	Continued involvement in development of fire prevention strategies for the ChEZ
The Global Fire Monitoring Center	Global center at University of Freiburg (Germany) with expertise in global level fire prevention strategies and measures	Involved during preparation and will continue involvement during project implementation
Other interested parties and potential donors (e.g Embassies of Belarus, Russian Federation, Japan, USA, Switzerland etc.)	Various	Contribution of expertise and co-finance for project activities
OTHER STAKEHOLDERS:		
Belarus - Polesky State Radiation Ecological Reserve	Maintaining adjoining Belarus protected area contaminated by the Chernobyl accident; ongoing research of radioecological effects in the Belarus contaminated zone	Sharing expertise, research and other coordination activities, and other joint activities including fire management and control (Observer status in Technical Advisory Group)
Residents of communities in surrounding areas (and formerly resident within the ChEZ)	Greater community level buy-in to help achieve sustainability	Sharing an abundance of local knowledge about the landscape
NGOs, domestic and international (Mama86, WWF, Wetlands International, Birdlife International)	Advocacy, implementing complementary projects aimed at achieving goals in respective area of	Support to project design and justification by formulating opinions of concerned public in

etc.)	interest (biodiversity conservation, forestry, birdlife, wetlands protection etc.)	respective area of interest (biodiversity conservation, forestry, birdlife, wetlands protection etc.) - members of Technical Advisory Group and Stakeholder Advisory Group)
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92. As stated above, several of these stakeholders were involved during project preparation. The MENR also hosted a workshop the objective of which was to solicit comment on key elements of the proposed project, the outcome of which is summarized in Section 5 of this project document. In addition, the project preparation team solicited additional views from stakeholders in Ukraine through electronic means. The MENR and the Chernobyl Center were involved in preparation of the PIF and participated in the Stakeholder Workshop held during project preparation. Various government ministries were involved through presentations and discussion.

2.6 Baseline analysis and gaps

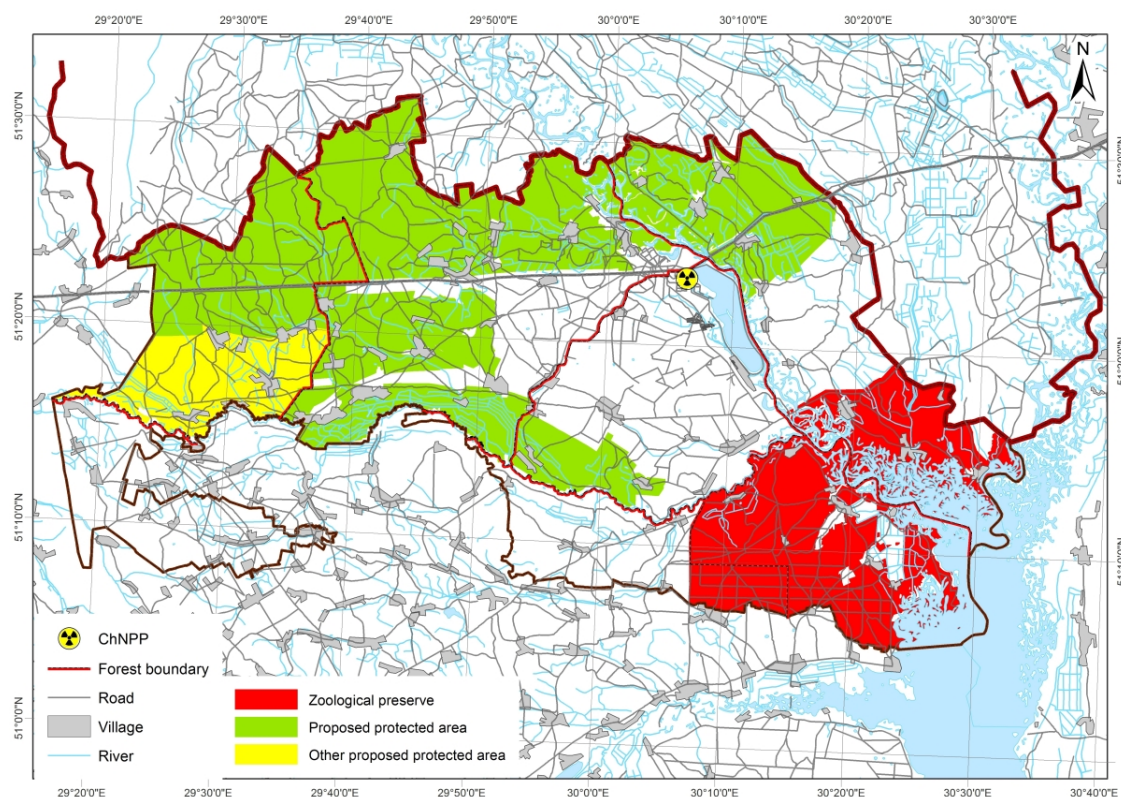
93. Since the accident, project and other interventions have been targeted to mitigating the harm done to human populations in and around the ChEZ, mitigating levels of radioactive contamination, and encasing the Chernobyl power plant. Examples of these projects and interventions include, among others:

- The UNDP Chernobyl recovery and development program (2004-2010), and the EU sponsored project Development of a strategic program for the socio-economic development of the Chernobyl region in the immediate vicinity of the Chernobyl exclusion (2008-2010).
- The International Chernobyl Research and Information Network (ICRIN) launched in 2009 was a three-year regional project and jointly undertaken by the IAEA, the UNDP, the United Nations Children's Fund (UNICEF), and the World Health Organization (WHO) and was designed to meet the priority information needs of affected communities in Belarus, the Russian Federation, and Ukraine and to translate the latest scientific information on the consequences of the accident into sound practical advice for residents of the affected territories. The ICRIN was financed through the UN Trust Fund for Human Security.
- The Plan of Activities of State Agency of Exclusion Zone Management to implement Association Agenda Ukraine – EU for 2012-2013 include implementation of international projects aimed mainly at radioactive waste management and water treatment. No biodiversity projects are mentioned there.
- The World Bank demonstration afforestation carbon project at Chernobyl. The objectives of the project were to re-establish approximately 4350 hectares of natural forests (birch and pine) on abandoned and low contaminated agricultural lands in the territory of Zhytomyr and Kyiv oblasts in 3rd and 4th zones of radioactive contamination, and to enhance sources of livelihood and incomes in poor rural areas and sequester Kyoto-compliant carbon from the atmosphere.
- The ongoing work associated construction of the New Safe Confinement (NSC) that will cover the existing shelter, removal of highly radioactive Fuel Containing Mass (FCM) from Unit 4, and the eventual decommissioning of the damaged reactor. The New Safe Confinement contract is funded through contributions by over 40 donor nations to the EBRD Chernobyl Shelter Fund. The Fund is expected to disburse around €1.54 billion in support of the Shelter Implementation Plan. It is expected that the New Safe Confinement, which will cost about two-thirds of this amount, will be completed in 2015.

94. While funded activities on biodiversity have generally not been the focus of attention the ChEZ, the Chernobyl Center of Issues of Nuclear Safety, Radioactive Waste and Radioecology has undertaken government funded research to identify sites in the exclusion zone with the highest index

of biodiversity as an indicator of ecological sustainability and radioecological sustainability, and which would receive consideration for being given the highest level of protected status.

95. The Figure below represents the current extent of protected area status within the ChEZ, and the results of the recommendations of the Center based on the government funded study.

Figure 5: Existing and Prospective Protected Areas in the ChEZ²⁰

96. For preserving valuable ecosystems and unique biodiversity within the ChEZ a zoological reserve of national importance the so-called "Chernobyl special", with a total area of 48,870 hectares, was established in 2007 by Presidential Decree 700 of 13.08.2007. However, its compact layout in the southeastern part of the zone does not reflect the variety of biodiversity that arguably should be under conservation, does not create optimal conditions for the migration of fauna within the Ukrainian and Belarusian parts of the zone, does not consider the need to protect the transit habitat and the transit route of migratory birds, and is currently categorized as an area with a low level of protection, meaning that there are at present no resources being committed to its longer term management.

97. Presently the under-funded and under-staffed Chernobyl Center does not have an environmental mandate, and also does not maintain a formal working relationship with the Polesky Nature Reserve in Belarus. It has a limited research program and current funding levels will continue to restrict both the extent and scope of its research related work in the ChEZ. There is no other organization that at present has a mandate to undertake the kind and scope of the assessments that would be needed to meet the project objective. Examples of gaps in research include:

- The persisting radioactivity levels within the zone have not been fully studied, and thus their effects on human health and biodiversity are not fully understood and mitigated;
- The management of radioactive waste that still exists within the core area will continue to accumulate, and the continuing accumulation will safely stored;

²⁰ The Government of Ukraine is actively planning and deciding upon the outlines of a Biosphere Reserve for the ChEZ. The above map is indicative only and was developed and presented as a protected area option by the Chernobyl Center at the Stakeholder Meeting undertaken during project preparation.

- The lack of appropriate monitoring programs for radiation levels across the wider ChEZ needs to be addressed;
- The need to mitigate the risk of forest fires (that could lead to radioactive fall-out through smoke) needs to be addressed in a manner consistent with maintenance of existing and growing biodiversity richness and the objective of maximizing ecosystem services. At present fire detection does not cover whole territory of forest lands of the ChEZ, and to the extent that it does it is not in digitized format;
- The need to undertake, and continue to update, assessments of overall forest health and extent of species diversity and composition;
- The role of local communities that were displaced from the area and now live in neighbouring territories, as well as the role of the few illegal settlers still living within the ChEZ need to be addressed on an ongoing basis; and
- The substantial amount of research that has been undertaken in the zone, over many years, needs to be collected, synthesized, a gap analysis undertaken, and a research agenda for the future developed and implemented.

98. At present, and as previously stated, approximately 20% of the ChEZ is under a low level of protection. Legislation to expand the extent of protected areas within the zone has not yet been developed, and ecological surveys within the zone are rudimentary, to the extent they exist at all. For example, an assessment of carbon stocks and other natural capital within the ChEZ are incomplete in some cases, and not undertaken at all in others. And socio-economic surveys are also incomplete.

Adequacy of existing legal regimes in Ukraine

99. Until recently, existing legislation of Ukraine was not conducive to the establishment of a Protected Area (or “Nature Reserve”) of the highest IUCN protection category within the ChEZ. Legislation assigned land tenure and administration rights for the ChEZ exclusively to the Agency of the Ministry of Emergency (MOE). The MOE was therefore responsible for all activities in the ChEZ, mostly related to radiation safety, management of radioactive territories and mitigation of accident consequences. The Ukrainian legislation:

- Did not provide for the option of transferring the management responsibility of radiation-affected lands (such as the ChEZ) to another Ministry (in the given case – Ministry of Ecology and Natural Resources);
- Only allowed for establishment of natural Protected Areas of lower conservation category;
- Made no provision for the creation of a special management organization; and
- For radiation safety reasons, considerably restricted possibilities for land management that would be required or appropriate for Natural Reserves (e.g. allowing long-term stays of PA staff in radioactive areas).

100. However, as the laws and international obligations of Ukraine regarding environmental protection are applicable countrywide, they do apply to the ChEZ. In particular, existing legislation supports the protection of sites where “red-listed” species are found, and particularly for those sites of importance for species’ reproduction, or as critical sites along bird migration routes, etc. The existing legal mechanisms allow establishment of appropriate conservation measures within any given area, even without establishing the highest-category Protected Area. Since the de-facto and quasi-total protection that has been in effect since 1986 for the ChEZ greatly simplifies the long-term physical protection of such a valuable natural area, with limited additional cost. The “radiation-hazardous lands” status of the ChEZ may be regarded as equivalent to the highest-category IUCN conservation status (where no human activity is allowed), but where no appropriate Protected Area Management structure has yet been established.

101. The original purpose and main objectives for the ChEZ had been centered on improving safety and working with affected populations, and are now either mostly achieved or continuing. The area itself is currently considered a rather stable and manageable ecosystem, with substantially reduced threat from contamination. However several of the critical factors, as described above, are not yet properly monitored and understood nor adequately managed, and new issues are emerging. Examples of emerging issues include definition of the future role of local communities that were displaced from the area and now live in neighbouring territories, and of the few illegal settlers still living within the ChEZ. In October 2012 MENR submitted a request to the State Agency of Exclusion Zone Management “Regarding enlargement of the territory of all-zoological wildlife preserve of all national significance “Chernobyl special.” The request stated, among other things that “we consider important to use the positive experience of Belarus, having enlarged all-zoological wildlife preserve ‘Chornobyl special’ or having established within it a biosphere reserve.”

102. A relevant scientific explanatory report with biodiversity value of the sites of the ChEZ was prepared by Institute of Zoology of Ukraine. The MENR requested that the Agency provide proposals regarding the sites in the ChEZ and the obligatory resettlement zone which could be used for enlargement of the existing or establishment of a new protected area. In early 2013 the Agency responded positively. At present, preparations are underway for joint meetings of all governmental institutions necessary to define further steps for the enlargement of the planned reserve.

103. Further, in late 2012, the Decree of the President of Ukraine on 24.12.2012 reorganized the Ministry of Emergency Situations of Ukraine into two new sections: the State Service of Emergency Situations and the State Agency for Technogenic Safety. At the same time, the State Agency of Exclusion Zone Management was to be coordinated via the Minister of Environment and Natural Resources of Ukraine. At least theoretically, this reorganization should simplify attempts to establish natural Protected Areas of higher conservation category and consequent special management organization within the ChEZ.

104. In summary, under previous conditions (institutional, personal, legislative, policy) there were no clear targets on biodiversity support and nature conservation, no management plan for nature protection and carbon sequestration, nor mitigation of land degradation in the ChEZ – the only plans envisaged commercial timber harvesting and prospective plans on biomass plantations. This presented an immediate risk of loss of major biodiversity and climate change mitigation values offered by a well-managed ChEZ, whereby all the range of its economic values, also in the form of ecosystem services and natural capital, are properly assessed and taken into consideration as a basis for policy decisions. Clear support for establishment of biodiversity targets and nature conservation, development of a management plan for nature protection and carbon sequestration, and development of mitigation measures for land degradation is a pre-requisite for managing what are likely to be competing demands for the natural resources of the ChEZ.

2.7 Linkages with other GEF and non-GEF interventions

105. A number of initiatives are either ongoing or planned within and around the ChEZ, with funding from the Government of Ukraine (GOU) and international donors. These include:

- The Chernobyl Shelter Fund was established in 1997 to finance the Shelter Implementation Plan (SIP). The plan calls for transforming the site into an ecologically safe condition by means of stabilization of the sarcophagus followed by construction of a New Safe Confinement (NSC). While the original cost estimate for the SIP was US\$768 million, the most recent estimate is \$1.4 billion. The SIP funds are being managed by EBRD and a consortium of Bechtel, Battelle, and *Electricité de France* designed a movable arch, constructed away from the shelter to avoid high radiation, to be slid over the sarcophagus.
- The Chernobyl Recovery and Development Program (CRDP) launched by UNDP in 2003 for

the recovery of the affected areas. The program is based on the recommendations in the report on Human Consequences of the Chernobyl Nuclear Accident. The main goal of the CRDP's activities is supporting the Government of Ukraine in mitigating long-term social, economic, and ecological consequences of the Chernobyl catastrophe. CRDP works in the four most Chernobyl-affected areas in Ukraine: Kyivska, Zhytomyrska, Chernihivska and Rivnenska. Several donors (i.e. Japan, Canada, Switzerland) have contributed \$4.0 million.

- The International Project on the Health Effects of the Chernobyl Accident (IPEHCA) was created and received US \$20 million, mainly from Japan, in hopes of discovering the main cause of health problems due to radiation. These funds were divided between Ukraine, Belarus, and Russia, the three main affected countries, for further investigation of health effects. Linkages between this project and the Fukushima nuclear disaster and other lesser nuclear accidents will be the subject of activities under Component 3.
- The International Chernobyl Research and Information Network (ICRIN) launched in 2009 is a three-year regional project, a joint effort by the International Atomic Energy Agency (IAEA), the United Nations Development Program (UNDP), the United Nations Children's Fund (UNICEF), and the World Health Organization (WHO) designed to meet the priority information needs of affected communities in Belarus, the Russian Federation, and Ukraine. Funded by the UN Trust Fund for Human Security, this initiative aims to translate the latest scientific information on the consequences of the accident into sound practical advice for residents of the affected territories and make them transparent.
- In 2011, year of the 25th anniversary of the NPP accident, and in conjunction with the occurrence of the accident at the Fukushima NPP in Japan, several countries have pledged support for the rehabilitation efforts of the ChEZ area and NNP de-commissioning, also in view of improving our understanding and capacity to manage and mitigate the damages caused by such nuclear accidents, i.e. through the optimization of natural recovery processes. In this context, the long-term experience of the ChEZ is regarded as a valuable study case that can generate lessons, approaches and methodologies of global relevance.
- The Eastern Partnership Community committed EUR 2,013,249 to upgrade the Automated System for Monitoring the Radiation Situation (ASMRS) in the Chernobyl exclusion zone. The ASMRS will enable monitoring of further environmental media, to include advance computation capabilities and to integrate GIS technology with environmental radiation databases and meteorological data. The upgrade includes design, manufacture, testing, certification, delivery, and documentation required and supervision of the installation and commissioning, functional tests, support to licensing, trial operation of equipment. Also included is provision of training to the end user's personnel and provision of after-sales service.
- The European Union has long been active as an international donor for Chernobyl activities. In addition to having contributed EUR 364 million to the Chernobyl Shelter Fund, the EU has since 2009 assisted people in the region to overcome post-accident stigma and encourage growth and business development in and near the Exclusion Zone. The EU has carried out projects in areas such as healthcare, education and agriculture. More specifically, and currently, the EU is:
 - Supplying of medical equipment to the Ivankiv Hospital with equipment in order to measure radioactive and chemical agents in human beings as well as in their food; monitor and analyze the levels of internal radioactive contamination of the population; and enable prevention of diseases of mothers and children providing to pregnant women medical control.
 - In close cooperation with the Science and Technology Centre Ukraine (STCU) efforts are underway to create an information center for collective and individual radiation protection and safety for people living in the area.
 - Providing support to update the mapping of the radioactive contamination of the

- exclusion zone.
- Supplying and installing a greenhouse as a significant part of the population in Ivankiv uses their own gardens for food production.
 - Supplying and installing a wood incinerator the uncontrolled growth of vegetation, fallen trees and the lack of responsible forest maintenance, since the Chernobyl accident has created conditions favorable for large-scale spontaneous wildfires in the area. Such wildfires are likely to occur in the Exclusion Zone under extremely dry and windy conditions (similar those in Russia in August 2010) and could spread radioactive substances over hundreds of kilometers inside but also outside of Ukraine. To prevent such a situation, the controlled incineration of the dry forest will be implemented. The generated energy will be used for powering existing local district heating systems. This will reduce the need for imported natural gas and the costs for energy..

106. The project has and will continue to take full account of these initiatives as the project moves into implementation. Further, the project will work closely with these and other potential project partners to ensure maximum collaboration and achieve maximum efficiencies across project related activities.

SECTION 3: INTERVENTION STRATEGY (ALTERNATIVE)

3.1 Project rationale, policy conformity and expected global environmental benefits

107. The project supports the Goals and Objectives of three GEF Focal Areas (FAs) as per GEF-V:

- Biodiversity;
- Climate Change; and
- Land Degradation.

108. In particular, the project will contribute to the achievement of the following specific GEF Focal Area Objectives and their associated Outcomes:

109. BD-1: Improve Sustainability of Protected Area Systems. Outcome 1.1: *Improved management effectiveness of existing and new protected areas*. The project is responsive to BD-1 through the establishment of one of the largest new Protected Areas in the region. It also provides enhanced capacity to monitor the impact of the Chernobyl NPP accident on several globally important populations of rare and endangered species, as well as preservation of some critical sites along the Africa-Eurasian Flyways (bird migration routes).

110. An assessment of global significance appears earlier in this project document. *Global environmental benefits in biodiversity* that would be derived include:

- The current ChEZ linked to the Polessky State Radio Ecological reserve in Belarus, combined with the nearby Drevlyansky Nature Reserve in Ukraine would create a protected area in and around the ChEZ of over 5,000 sq. kms;
- Permanent protection for the growing number species of vertebrates that have been and will continue to be recorded in the ChEZ;
- Permanent protection for growing numbers of ungulates, carnivores, and other game species whose numbers have dramatically increased since the accident;
- Permanent protection for 55 species that are part of the “Red List” of Ukraine;
- Permanent protection for important habitat for migratory birds as the ChEZ lies at the intersection of several main flyways; and
- Permanent protections for the increasing numbers of lichens, mosses and higher plants that now populate the zone.

111. In summary, the project would assure continuing protection to the 23 different terrestrial and 7 aquatic phyto-systems, the 12 terrestrial and 8 aquatic zoo-systems, five types of landscapes, and 15 types of soils.

112. Following is a table depicting the range of Aichi Declaration targets that will be addressed by the project:

Table 4. Project Contribution to Aichi Declaration Targets

CBD Aichi 2020 Targets which the project will contribute to	How the project will support the achievement of each target – initial SMART indicators (to be further selected and refined at CEO submission)
Target 1 (awareness of biodiversity values)	Awareness of BD conservation values and sustainable use is increased at local, national and regional levels as well as globally through the emphasis on actions that will be undertaken to assure that studies, assessments, inventories and other measures undertaken during implementation will lead to an expanded and strengthened PA system based on biodiversity values
Target 2 (BD integrated in local and national poverty reduction strategies...)	Demonstrating of how BD conservation and poverty reduction are integrated in local level planning processes in the ChEZ – and providing lessons for up-scaling at national, regional and international levels.
Target 5 (loss of natural habitats)	Loss of major tracts of natural habitats in the ChEZ will be avoided through identification of values associated with maintenance of existing and growing richness of natural habitats and improved land management practices
Target 7 (sustainable management)	The project will help ensure sustainable management of ChEZ biological resources through development and implementation of a PA management plan and development and implementation of a fire monitoring and response plan
Target 11 (inland water and coastal and marine areas)	The project will, through increases in the current size and level of protection for protected areas in the zone, to not only meet but substantially exceed the Aichi target of 17% of protection
Target 12 (species extinctions)	The project will assist in measures to stem species extinctions and afford protection to endangered species through increased amounts of protected terrestrial and wetland areas in the zone, which is part of a corridor for the Eurasian flyway
Target 15 (Carbon stocks enhancement)	As the one of the principal objectives of the project is carbon stock protection and enhancement, this target will be met
Target 18 (traditional knowledge)	Traditional knowledge will be incorporated into project activities through stakeholder involvement; improved knowledge of the natural capital in the ChEZ by virtue of the estimated 300 jobs that will be created for management of the expanded PA system
Target 19 (BD science improved)	Latest BD conservation science based on forest and wildlife inventories and other studies and measures, including climate change considerations, will be applied to the development of the PA network and management plan for the ChEZ
Target 20 (resource mobilization)	A long term sustainable financing strategy for the ChEZ is developed, focusing on commitment of the government to assure continued finance for the long-term implementation of the PA plan

113. CCM-5: LU-LULUCF: *Promote conservation and enhancement of carbon stocks through sustainable management of land use, land-use change, and forestry.* Outcome 5.1: *Good management practices in LULUCF adopted both within the forestland and in the wider landscape.* The project is responsive to CCM-5 through the establishment of monitoring and sustainable management systems for the conservation, enhancement and management of carbon stocks in large areas of Forests and non-forest lands (including wetlands and peatlands). This will include measures to mitigate the risk of forest fires - and danger of consequent and potentially severe radioactive fall-out - within the Chernobyl Exclusion Zone.

114. *Global environmental benefits in relation to climate change mitigation (CCM) and land degradation* would include:

- Increased levels of carbon sequestration as preliminarily described in this project document. Intensive accumulation of carbon has taken place since 1986 in more than 60 thousand hectares of former agricultural lands, where stable cover of perennial herbs have been replaced by natural regeneration of pine and birch, whose age now ranges from 5-25 years. Further, in areas close to massive forests, perennial grasses have now been formed. The typical succession process of grasslands in the temperate climatic zone of the ChEZ is typically multi-species indigenous forests with consequent high carbon sequestration.
- The mitigation of potentially catastrophic fires in and around the ChEZ. These potential fires

would, in addition to threatening the health of local populations, substantially diminish the existing and growing amounts of stored carbon in forests and other landscapes; and

- Through establishment of good management practices, ensure that the substantial present and increasing levels of biodiversity and carbon enhancement value of the ChEZ will continue indefinitely and, through a focus on the provision of ecosystem services, benefit local populations.
- As well, a major activity of the envisioned Center would be to identify and repatriate much existing research that has been conducted in the ChEZ by various researchers, institutions and countries, the results of which have not been made available to Ukraine. The Center would become the central “clearing house” for Chernobyl related research, accessible to to national and international organizations.
- The use of an ecosystem-based approach to mitigate threats posed by climate change. This approach is a cornerstone of the project. UNEP has done pioneering work in demonstrating how maintenance of healthy ecosystems is an important line of defense against potential negative influences of climate change. This approach, also known as “Ecosystem-based Adaptation” (EbA), demonstrates that healthy, well-functioning ecosystems enhance natural resilience to the adverse impacts of climate change and reduce the vulnerability of people²¹. Thus ecosystem-based management, consistent with the objectives of this project, offers a valuable yet under-utilized approach for climate change adaptation, complementing traditional actions such as infrastructure development or other investment related initiatives.

115. At the time of PIF submission and approval, it was stated that information pertinent to Objective 5 of the LULUCF, as described above, would be provided at time of CEO endorsement. While it has not been possible to develop a set of good management practices and a carbon stock monitoring system during project preparation²², the other values appearing in the table, indicative of the substantial number of hectares that will move into protected status and the resulting GG avoided emissions and sequestration, have been calculated and appear below:

²¹ Ecosystem-Based Adaptation Guidance: Moving from Principles to Practice. UNEP Working Document: April 2012

²² These values will be addressed during project implementation.

Table 5. Target Conservation Areas

Expected land use change as a project result²³	Total existing before the disaster and recently established preserved areas in ChEZ, ha	Proposed based on criteria of maximum preservation of existing biodiversity values in ChEZ (not included existing preserved areas), ha
Conservation and enhancement of carbon in forests, including agroforestry	5027.9 ha	60736.2 ha
Conservation and enhancement of carbon in non-forest lands, including peat land		32804.4 ha (Including 10031,2 of peat lands)
Avoided deforestation and forest degradation		10400 ha (Including an est. 5000 ha of prevented large fire events)
Afforestation/reforestation		22773.2 ha Grass lands of potential reserve in ChEZ that will naturally become forests under preservation regime

Table 6. GHG avoided emission and sequestration

	CO2 eq tons	Comments
Lifetime direct GHG emission avoided	1408218	Emissions avoided because no harvesting will be allowed on protected area, large fires will be prevented, grasslands will not be ploughed for energy plantations
Lifetime indirect GHG emission avoided	693187	Emissions from loss of C from forest litter and soil avoided due to prevention of harvesting, fires and plowing
Lifetime direct carbon sequestration	8406001	Direct carbon sequestration on potential ChEZ biosphere reserve (area 93540,6 ha) as proposed by the Chernobyl Center
Lifetime indirect carbon sequestration	1115887	Natural conversion of grasslands that inside of natural reserve to forests with additional sequestration of C

²³ Estimate of expanded ChEZ protected area as suggested by the Chernobyl Center. Information generated by Dr. Sergiy Zibstev.

Table 7. Estimation of carbon accumulation in forests, grass and peat lands on the territory of potential biosphere reserve in ChEZ (total proposed by Chernobyl International Center area of the reserve – 93540 ha)

Category of land of potential preserved area in ChEZ	Area, ha	Amount of CO ₂ , t/ha				Total est. carbon storage in potential preserved area, 1000 t CO ₂
		soil	litter	biomass	total	
Forests	44897.4	18	0.4	67.00	85.40	3834.24
Grasslands	22773.2				18	409.92
Swamps under forests	15838.8	100	0.8	67.00	167.80	2657.75
Peat lands	10031.2	150			150.00	1504.68
Total	93540.6					8406.59

116. LD-2: Integrated Landscape Management: Reduce pressures on natural resources from competing land uses in the wider landscape. Outcome 3.2: *Good management practices in the wider landscape demonstrated and adopted by relevant economic sectors.* The project is responsive to LD-3 through the formulation and initial implementation of an integrated management plan for the ChEZ area.

117. Last, the project is fully consistent with, and makes possible the realization of what was described in the report of the Chernobyl Forum²⁴ as a necessary approach to economic development of the Chernobyl affected landscape. The approach was seen to be one that would:

Explore the possibilities for promoting ecological tourism and for maximizing the contribution of these areas can make to the preservation of international biodiversity. Little attempt has been made to exploit the reduction of human disturbance to the ecosystem and cultural landscape in a positive way and the current national plans for biodiversity protection and cultural preservation hardly refer to this potential. The territories could be used to fulfill the three countries international obligations on the protection of biodiversity.

118. Last, the project is also fully consistent with and complementary to the objectives and expected outcomes of the ongoing UNEP Program of Work, specifically under the Ecosystem Management and Environmental Governance sub-programs.

3.2 Project goal and objective

119. The project objective is to *Conserve, Enhance and Manage Carbon Stocks and Biodiversity in Forest and non-Forest Lands and Promote Sustainable Development in The Chernobyl Exclusion Zone through the Establishment of a Research and Environmental Protection Center and associated Protected Area within and around the current Chernobyl Exclusion Zone (ChEZ), in Ukraine.*

²⁴ Chernobyl's Legacy: Health, Environmental and Socio-Economic Impacts and Recommendations to the Governments of Belarus, the Russian Federation and Ukraine. The Chernobyl Forum, Second revised version.

120. At present, approximately only 20% of the ChEZ is in low protected status, meaning there have been few government resources, human or financial, to manage current protected areas, including no direct budget allocation. Indeed, at present there is no sustainable management plan for the ChEZ, although there has been some limited and initial forestry planning. The priority within the ChEZ has been the reduction of threat levels from radionuclides with no emphasis on conservation and sustainable use. Further, the current Chernobyl Center is underfunded, under staffed, and its mission has generally not included an environmental emphasis.

121. Objective level indicators for the project include:

- Evidence of the formal establishment of a large protected area within the ChEZ with formalized links to the Polesky Nature Reserve in Belarus;
- A formally adopted Protected Area Management Plan for the ChEZ; and
- Evidence of sustainable funding for a ChEZ Environmental Protection Center.

122. Baseline conditions, targets, monitoring milestones and risks related to the Project Objective are described in the Results Framework that appears in this document as Appendix 4, the Workplan and Timetable described in detail in Appendix 5, Key Deliverables and Benchmarks described in detail in Appendix 6, and the Costed M&E Plan in Appendix 7.

3.3 Project components and expected results

123. The project has three components. Component 1 aims to improved monitoring and research for large areas of forests, wetlands, and other habitat types and associated carbon benefits in the ChEZ. It will result in creation of a Research and Environmental Protection Center, which will take the lead in efforts to collect and synthesize existing research, undertake a gap analysis, and develop and implement a research program consistent with Component 2 is establishment and management of a full protected area network. The new protected area network will enable protection of biodiversity, mitigate land degradation and maintain carbon stocks in large areas of forest and non-forest lands, including wetlands and other habitat within the ChEZ. This component will include a wide reaching dissemination strategy to secure participation, build and strengthen partnerships, and contribute to further understanding and appreciation of the social, economic, and environmental benefits that will accrue to the ChEZ and surrounding area. Civil society engagement will include informal presentations and media communications on the project and its relevance to society at large. Component 3 captures lessons learned, field-testing and dissemination of results. Component 3 will ensure mainstreaming of project results. The communication process of this Component will include traditional scientific publications to demonstrate the credibility and applicability of project results. The participation of international scientific organizations in project activities will facilitate the communication of results as well as help in ensuring replication in other areas as necessary. Lessons learned will be made widely available through written reports, the project website, and through training manuals developed and distributed by the Research and Environmental Protection Center.

124. The project will reduce threats to globally important biodiversity, help assure carbon sequestration benefits, and reduce land degradation in the ChEZ through an applied ecosystem services approach at national, transboundary and global levels. Thus the project components, outcomes, and outputs have been carefully developed taking into account the acquired high global importance of the area for biodiversity conservation and climate change mitigation, and the complex interaction of a wide range of environmental as well as human health issues at play in the area.

125. The promotion of environmental conservation activities within ChEZ is regarded as a high priority by the Government of Ukraine (GOU). However, it is also clear that conservation should be combined with continued radio-ecological research and close monitoring of ChEZ ecosystems. Hence protected area management will be supported by an intensive and long-term research and monitoring program.

The program will also include the evaluation of the full range of ecosystem services provided by the protected area, as well as the assessment of the area's future conservation and development prospects, as a basis for development of balanced approaches to the sustainable management of natural resources within the region, in collaboration with disadvantaged communities in neighboring areas and in full adherence to radiation safety requirements.

126. The project components are intertwined, and will jointly lead to developing capacities of decision makers, users and beneficiaries of ecosystem services as well as intermediaries to develop and apply appropriate ecosystem management tools within sectoral planning frameworks and explore the potential for national, regional, or global markets for ecosystem services. This will be achieved through:

127. **Component 1** is the establishment of a Research and Environmental Protection Center, or REPC. These complex issues described above underscore the importance of an improved and coordinated management approach for the ChEZ. This component will provide GEF incremental support to the GOU in taking the first steps towards the implementation of a set of appropriate environmental monitoring and management measures for the ChEZ through establishment of the dedicated Chernobyl Region Environmental Protection Center. The exact location of the REPC will be determined during project implementation.

128. The Chernobyl region offers a globally unique opportunity for the ongoing conduct of radioecological and radiobiological research in an otherwise natural setting. Such studies are, except for very small-scale experiments, not possible or difficult to perform elsewhere, and this Component will lead to the collection, synthesis, and distribution of important data and information from a single, major center as envisioned in the project. Outcomes and Outputs for Component 1 include:

Table 8. Component 1 Outcomes and Outputs

Component 1	Outcomes	Outputs
Component 1: <i>Establishment of a Research and Environmental Protection Center</i>	Improved monitoring and research for large areas of forests, wetlands, and other habitat types and associated carbon benefits in the ChEZ.	<p>1.1 The REPC established and fully functional</p> <p>1.2 Comprehensive assessment of the current state and trends of natural ecosystems in the ChEZ.</p> <p>1.3 Assessment of the status and potential of ecosystem services and their values and enhancement of carbon benefits in terms of meeting LULUCF targets in the ChEZ .</p>

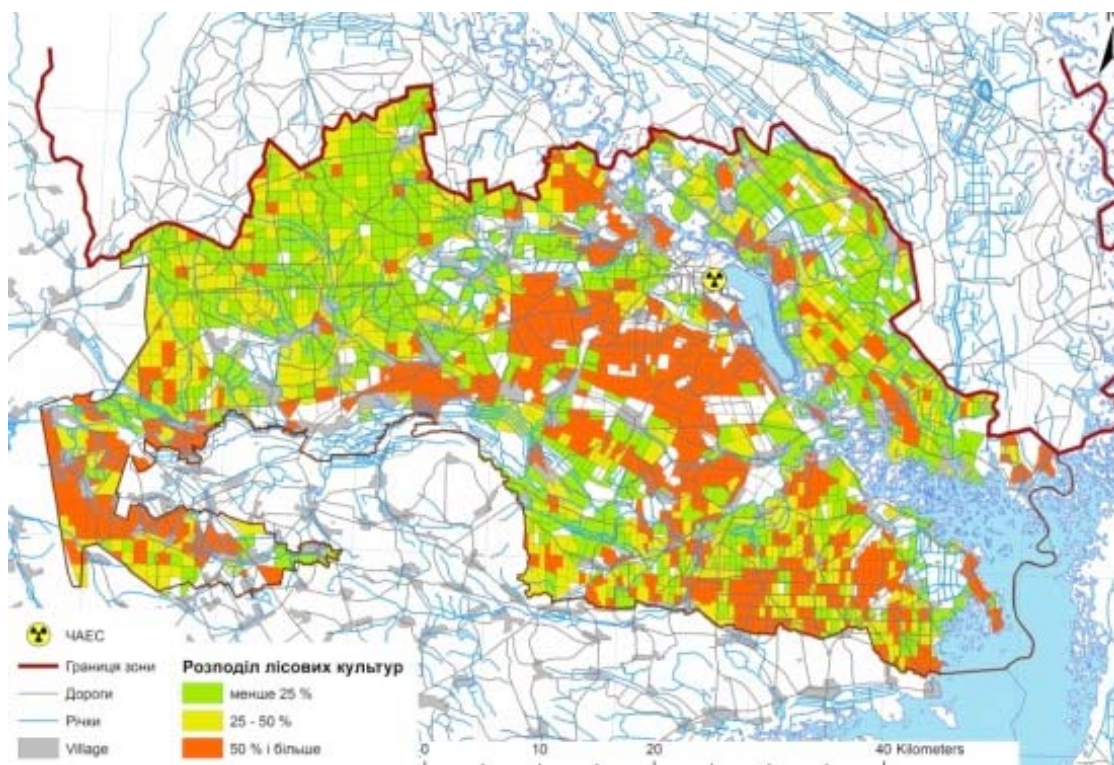
129. The key indicators for Component 1 will be evidence that environmental monitoring systems have been designed, are operational, and are generating information on the state of the ChEZ environment.

130. **Component 2** will result in establishment and management of a full-protected area. Within the ChEZ this will be accomplished by a biosphere reserve designation. The Government is currently working to define the zones within a proposed Biosphere Reserve for the ChEZ. While definition is not complete all indications is that the new protected area will be similar to that depicted in Figure 5. Consistent with the Biosphere Reserve designations, there will be in the ChEZ a combination of core areas, buffer zones, and zones where stakeholders work together to manage and sustainably develop the resources of the ChEZ.

131. There are areas within the ChEZ that pose dramatic fire risk and attendant dangers of consequent radioactive fallout that would pose significant danger to fire fighting personnel, possible danger to Kiev and other countries, depending on wind direction, and the danger of crop contamination. Areas at risk of forest fires would be part of integrated use settings where necessary thinning and, in some cases, necessary clear-cutting would be employed. It is also planned that discussions will be held with officials from Belarus with regard to appropriate joint planning for fire risk management.

132. Following is a map depicting the various stands of forests (forest blocks) within the ChEZ. Note that the green blocks are areas of highest quality forest and also that part of the overall ChEZ landscape possessing the highest biodiversity values. Note that the most vulnerable blocks, shaded red, are in the areas of highest contamination. Note also that many of the green blocks, denoting the highest levels of biodiversity, adjoin the Polesky Nature Reserve, generally north, northwest and northeast of the national boundary. The project involved officials from Belarus generally, and specifically from the Reserve, during project preparation. Close cooperation and joint activities with the Reserve will continue during project implementation.

Figure 6. ChEZ forest blocks



133. The Overall Component 2_indicator is development of legal documentation establishing new protected areas; number of hectares declared as Biosphere Reserve ;takeholders contributing to maintain and protect nature reserve; management plans; carbon stock assessments; maps of new protected areas; approved budgets and workplans. Outcomes and Outputs for Component 2 include:

Table 9. Component 2 Outcomes and Outputs

Component	Outcomes	Outputs
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Component 2: <i>Establishment and Management of a Full Protected Area Network</i>	Improved management of natural resources and carbon stocks within and around the ChEZ.	<p>2.1 Formal designation of the ChEZ as Biosphere Reserve for enhancing conservation and management of carbon stocks.</p> <p>2.2. Measures developed to ensure financial and institutional sustainability of multi-sector conservation programs.</p>
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134. **Component 3** will include learning, field-testing and the dissemination of project results. The key Component 3 indicator will be documentation of the number and extent (national/international) of distribution and use of, and feedback derived from use of project-derived lessons learned and best practices, and recommendations developed and published on habitat rehabilitation, carbon stocks management and biodiversity conservation emerged from prior and ongoing work in the ChEZ, and applicable similar situations. Outcomes and Outputs for Component 3 include:

Table 10. Component 3 Outcomes and Outputs

Component	Outcomes	Outputs
Component 3: <i>Learning, Field Testing and Dissemination</i>	Increased availability and access to critical knowledge needed for decision-making for effective sustainable management of the ChEZ.	<p>3.1 A set of lessons learned and practical recommendations on habitat rehabilitation, carbon stocks management and biodiversity conservation developed and published.</p> <p>3.2 Knowledge sharing at national and international level and training programme field tested and available for replication.</p>

135. As was the case with the project Objective in the previous section, a more detailed description of the expected outputs within each component, including baseline and assumptions and risk information, can be found in the Results Framework that appears in this document as Appendix 4, the Workplan and Timetable described in detail in Appendix 5, Key Deliverables and Benchmarks detailed in Appendix 6, and the Costed M&E Plan in Appendix 7.

3.4 Intervention Logic and Key Assumptions

136. Consultations undertaken with the MENR, prior to submission of the PIF, made clear that at that time conditions were regarded by the Ministry of Ecology and Natural Resources and the GOU as very favorable in terms of the establishment of a well-managed Protected Area in the ChEZ, with Biodiversity Conservation and Climate Change Mitigation as its main objectives, and creation of a Biosphere Reserve as a preferred mechanism. Subsequent consultations with stakeholders confirm that the timing continues to be favorable, and that the government continues to be strongly committed to proceeding with an expansion of protected areas within and around the ChEZ, as demonstrated by the sizeable increase in government co-finance over what was initially committed at the time of PIF submission.

137. More specifically the intervention is required to:

- Establish an appropriate ecological and radiological monitoring and management system

across the ChEZ, which at this time does not exist and the creation of which is a specific objective of the project. The active research and monitoring programs proposed under this GEF project are an essential first step to lay the scientifically sound foundations for subsequent habitat conservation measures that can ensure the long-term conservation of the significant biodiversity and carbon stocks currently held in the ChEZ, and the mitigation of risks to human health. An area wide radiological monitoring and management system would focus on developing sound scientific evidence on the status of biodiversity and ecosystems in the zone. Such scientific evidence is not only scarce but what does exist is sometimes contradictory.

- Mitigate the human health risks posed by inevitable and potentially catastrophic forest fires. As previously mentioned the “no action” option, in the context of these inevitable fires, ignores the risks posed to surrounding populations in Ukraine, and depending on the extent and atmospheric conditions at the time of fires, populations in surrounding countries.
- Mitigate the risk, through sound research, that existing, largely monolithic forest habitat in the zone will face increasing threats by common diseases, thereby jeopardizing their survival.
- Provide socio-economic benefits to surrounding populations, an example of which would be the generation of approximately 300 jobs associated with creation and strengthening of the ChEZ protected area system and accompanying Research and Environmental Protection Center. Most of these employment opportunities would be in the immediate vicinity of the ChEZ.
- Formulate a Protected Area Management Plan as the basis for establishment of a well-managed and sustainable protected area in and around the ChEZ, as described elsewhere in this project document.

138. Key assumptions, as well as risks are enumerated in the Results Framework that appears in this document as Appendix 4, as well as in the Risk Table, and accompanying risk mitigation measures, appearing on the next page. In summary, key assumptions and risks include:

- The project must assume continued government support for establishment of a large, new protected area in the ChEZ; risk that PA will not have sufficient level legal status and thus of protection, and a related risk that Ukraine and Belarus will fail to enter into the cooperative arrangements that would lead to an integrated effort.
- Assumes adequate and successful level of inter-ministerial support for and provision of sustainable financing from government and other sources (bi and multi lateral donors, cooperative ventures with other research institutions)
- There is an overall risk that government decisions on extractive resource uses within the zone will prevent enhanced management consistent with project objectives.
- There is an assumption that applications for natural resource use in the zone will be undertaken only after studies and inventories have been completed.
- There is a risk that potentially catastrophic forest fires will erupt in the zone before the project can effectively address that threat.

139. The project objectives, and subsequent views expressed by stakeholders, are fully consistent with the original aims of the existing ChEZ, which recognize that the preservation of natural ecosystems constitute probably the most appropriate, efficient, and safe measure to prevent the spread of radioactivity. Supporting the restoration and conservation of natural and semi-natural habitats is expected to guarantee the best avenue to safety within the neighboring areas. The historic approach to the management of the ChEZ did not, and does not contradict the objectives of nature conservation in terms of the long-term prospects for conservation and sustainable development of the ChEZ.

140. In summary, the proposed project, through creation of an expanded and strengthened protected area, will increase opportunities for contact between neighboring populations of several species

(including vulnerable and threatened), and allow a higher degree of local/regional movement and seasonal migrations. This is likely to foster increased levels of genetic diversity, enhancing their long-term viability, especially those species with a lower distribution density, and vulnerable ones.

3.5 Risk analysis and risk management measures

141. The table below highlights specific risks that are related to the key assumptions that could affect successful implementation of project activities and the corresponding risk mitigation measures.

Table 11. Risks and mitigation measures

Risk	Risk Level	Mitigation Measure
Climate Change Over the past several years severe forest fires have increased in intensity and seasonal duration in the vicinity of the ChEZ, and climate change is suspected as being a major contributor to this change	Medium	The research plan that will be developed during project implementation will include climate change mitigation strategies, deemed especially important in relation to fire hazards in the ChEZ as described below
Fire hazards In forests contaminated by radiation fire poses a continual risk (in addition to carbon emissions): forest fires could send clouds of smoke carrying radioactive material into the atmosphere, contaminating fire fighters and posing a risk to food production. Forest fires in the ChEZ contain radioactive cesium, strontium and often plutonium. In the products of combustion (ash and partially burnt fuels), the concentration of radionuclides sharply increases. A part of the radioactive ash remains at site, while the remainder is released in smoke aerosols and transported over various distances. The observed and anticipated pattern of climate change, with modified rainfall patterns and extended periods of drought, are expected to increase the risk of forest fires, as well as the risk of attack by insect pests.	Medium	The project will promote a range of applicable sustainable land-use and forest management practices that will reduce wildfire hazards, while also enhancing carbon stocks. These may include i.e.: silvicultural measures for reducing wildfire hazard in coniferous forests, particularly the introduction of less flammable and economically valuable broadleaved tree species intermixed in pure coniferous stands; thinning operations and sanitary cuts; construction of anti-fire barriers consisting of firebreaks and internal fuel breaks, fire-resistant forest edges and shaded mineralized shelterbelts.
Reduced commitment to the conservation-based nature of project objectives and outcomes due to changes in government	Medium/High	Changes in government commitment cannot be excluded and are difficult to assess. The recent change in government serves as an example of this risk. For this reason, among others, the project has been based on inclusion of a wide group of stakeholders at each step of project formulation, and this will continue to be the case during implementation, which increases the chances for continuity and sustainability. Further, the utilization of existing institutional structures in e.g. the MNRE, MoE, Academy of Science, National Universities and in the existing ChEZ Centre, as well as at technical working

		levels will have a mitigation effect in case of higher-level government changes; such bodies often continue to exist beyond governmental life cycles.
Weak institutional capacity	Medium	Within national governmental institutions as well as at local levels, the risk of a weak understanding of sustainable, ecosystem based management approaches is high. However, the project's strategy is founded on close interaction and capacity building at all levels of intervention in order to address this challenge, and government commitment is well demonstrated through substantial co-finance. Early and continuing stakeholder mapping and engagement (as initiated during the PPG) will help ensure project success.
Inability of the Government to meet its financial and co-financial commitment	Medium/High	The Government has made clear that its letter of co-finance continues to be valid. However, social, political and financial uncertainty remains
Continuing civil and international conflict may jeopardize the ability of the Government to properly focus on the project	Medium/High	As the project will be centered in Kiev and in the and around the immediate vicinity of the ChEZ, areas not in the south and east of the country where civil and international strife has occurred, this risk is seen as manageable
Lack of coordination among different stakeholders	Low	Coordination among various stakeholders at international, national and local levels is a risk in many environmental projects. The proposed project will therefore emphasize partnership building, common agenda setting, and alignment of interests from the outset. This will also be achieved through the set-up of an effective project Steering Committee and ad-hoc technical advisory group(s) (TAGs), as well as transparent consultation and communication mechanisms as described in the stakeholder consultation sections of this project document.
Ecosystem management knowledge is not applied or integrated into policy frameworks	Low	At local levels, participatory approaches will ensure buy-in of stakeholders, generation of local knowledge and self-esteem; close involvement of and training for decision makers from a variety of departments and sectors will increase the likeliness of ecosystem services approaches being internalized into national planning and policy making.
Communities resident in surrounding areas (and formerly resident within the ChEZ), are not supportive of conservation plans	Medium	This is a risk that can only be mitigated through continued and focused and well-targeted communication, consultation, education and involvement of local communities. A comprehensive and well-costed communication plan (ref. section 3.10) will be developed and operationalized as a first step at the outset of the project, to engage former local residents in the new initiative and mitigate any of misunderstanding or conflict. The project will also place emphasis the generation of socio-economic benefits associated with the establishment of the new Protected Area. Priority in job creation (preliminary government estimate is 300 jobs created through establishment and management of new protected area network) and capacity building will be given to the disadvantaged social groups, including women groups, within the surrounding community of former residents of the

		ChEZ.
The needs and priorities of the more disadvantaged groups of society, including and especially elderly populations in areas abutting the zone, are not adequately taken into account by development plans.	Low	This risk is fully acknowledged also on the basis of the review of the lessons learned in previous UN and GEF projects at the global level. Therefore all aspects of the project's design, implementation strategy and monitoring and evaluation process will closely look at this important aspect and take this risk into account. This will inform the set-up of adequate stakeholder consultation and involvement mechanisms from project outset, with full support from the GOU, and under the auspices and supervision of UNEP as the GEF implementing agency.
Negative socio-political impacts	Low	Socio-political safeguards were discussed during project preparation, addressed during stakeholder mapping, and will continue to be addressed during project implementation. The project further intends to use the valuating and mapping of ecosystem services to contribute to the promotion of equitable and pro-poor economic and financial incentives for sustaining ecosystem services. (ref also section 3.11)

3.6 Consistency with national priorities or plans

142. Biodiversity conservation and enlargement of the protected areas is one of the key priorities of *National Action Plan for Environmental Protection for 2011-2015* – NEAP (Plan) approved by the Order of the Cabinet of Ministers of Ukraine on May 25th 2011 № 577. Objective 5 of the Plan is to “Stop the loss of biological and landscape diversity and establishment of an environmental network” and includes, among other things:

- Development of new, and expansion of existing terrestrial and marine protected areas;
- Establishment and management of national parks, nature and biosphere reserves and botanical gardens, with consequent creation of substantial employment opportunities in the immediate area of the ChEZ; and
- Definition, before 2020, of the scope and size of a representative and interlinked nature reserve system shall be established. The total area of the reserves shall reach at least 17% of dryland and inland waters, and 10% of coastal and other marine areas within the Ukraine's exclusive economic zone (EEZ).

143. At present the legally protected area in Ukraine totals 35,889 km², 5.95% of the total national landscape. The proposed enlargement of protected areas in Chernobyl zone from 485 km² (current Chernobyl special zoological wildlife preserve) to 1,420–1,550 km² will support the implementation of the above-mentioned actions of the NEAP. Establishment of a large protected area in the ChEZ is seen by the government to constitute an important step toward realization of the objectives of the Plan.

144. The enlargement of protected areas within the ChEZ is also consistent with the Financing Agreement between EU and Ukraine regarding the EU, €30 million project titled *Support to the Implementation of the National Environmental Policy of Ukraine* ENPI/2009/020-398. The overall objective of this agreement is to support the implementation of Ukraine's sustainable environment strategy, in line with EC norms and agreed priorities under the EU-Ukraine ENP Action Plan. A specific indicator under the Financing Agreement is the expansion of natural habitats of flora and fauna representativeness. This indicator stipulates that by the end of 2013 the total area under conservation districts in Ukraine will have reached a target of 6.9% of the total area of the country. Thus expansion of and establishment of a management system for a substantially expanded protected area in the ChEZ is consistent with, and will help Ukraine meet, a target of the its Financing

Agreement with the EU.

145. The project is also aligned with the current “Ukraine - UN Partnership Framework (PF)” (formerly referred to as UNDAF) for the period 2012-2016, and specifically under the PF Assistance Area 4 on “Environment and Climate Change.”

3.7 Incremental cost reasoning

146. The incremental cost reasoning of the project has not changed since PIF submission. In the submission it was noted that without GEF support there is a danger that management of ChEZ will not take into account biodiversity conservation, carbon sequestration and sustainable land management objectives, and will continue on the current and limited dual track of focusing on radioactive safety and economic profit through, for example, the harvesting of biomass for wood gasification at the expense of the values that have emerged over the past 28 years.

147. The GEF contribution would be additional and incremental to the above baseline scenario. It will focus on the provision of specialized technical assistance, capacity building and limited investment in specialized equipment and infrastructure. This is expected to generate a wide range of Global Environmental Benefits, while supporting the capacity of the GOU towards:

- Ensuring the long-term conservation of globally important biodiversity and ecosystem services in existing and new protected area;
- Enhancing capacity to monitor and account for the climate change mitigation functions of large areas of forests and wetlands within the ChEZ and the new protected area;
- Supporting the establishment of long-term sustainable land-use and forest management practices for the large areas located within the ChEZ and the new protected area, including mitigation of forest fire hazard and consequent dispersal of radionuclides; and
- Development of lessons, principles, policy models, and strategic approaches and methodologies and associated training programs that can underpin the adoption of natural recovery processes for the rehabilitation of other areas of the world affected by nuclear accidents and/or isolated from human interventions for extended periods of time.

148. The GOU has invested enormous human and financial resources to establish and manage the ChEZ over the years, and plans to continue and expand upon this investment of resources, especially through expanded attention to the establishment and management of existing and an expanded protected area network, as evidenced by confirmed co-finance. The envisaged baseline and co-financing investment by the Government of Ukraine to control and monitor the status of the extensive ChEZ over the project period of four years will be approximately²⁵ US\$ 12,100,000. This includes, among other things, the budget for the Agency for the Management of the Exclusion Zone, relevant portions of the MENR budget, management costs, renovation and maintenance (including, e.g. utility payments, security, communication, office and labs maintenance, repair of existing and construction of new infrastructure, staff management, state-level certification and licensing, taxes and mandatory deductions, etc.) for the following main GOU assets and operations relevant to the project objective:

- Establishment and management of existing and an expanded protected area network.
- Laboratory and office facilities of the “International Radioecology Laboratory” and office premises, conference hall and essential equipment Chernobyl Center for Nuclear Safety, Radioactive Waste and Radioecology, consistent with project requirements, and all located in Slavutych town, outside the ChEZ.
- Laboratory premises, lab equipment and auxiliary facilities in Chernobyl town, located inside the ChEZ.

²⁵ Government budgets have not been developed or approved for the outyears of the project. The dollar amount is based on projecting the 2013 government budgets related to the ChEZ across the four project years.

- Monitoring, security, management and maintenance of infrastructure, fire control systems, of the 13 existing Protected Areas within the ChEZ, and of other adjacent protected areas totaling an approximate area of 1,000 sq km. In addition, the GOU is committed to extending this support to the wider ChEZ (2,600 sq km) based on the results of this project and the establishment of a new Protected Area.
- Management and maintenance of Several Landscape Management, Hydro-biological and Ecological Research Testing Grounds located within the ChEZ (including the NPP cooling pond and the Prypiat River).

149. The above represents a significant GOU baseline investment towards the establishment of the Protected Area and the set-up of the Center.

150. Further to the PIF submission, the following table represents a summary of the baseline scenario and proposed GEF incremental contribution, by component:

Table 12. Incremental reasoning

Baseline Scenario (Business As Usual)	GEF Incremental Contribution (what the GEF project will contribute)	Key Outcomes expected with the Alternative Scenario
<p>Component 1 – Establishment of a Research and Environmental Protection Center</p> <p>Conservation a low-priority for the ChEZ. An under-funded and under-staffed research center with limited research program. No formal linkage with Polessky Nature Reserve.</p> <p>No comprehensive research and field experiments program planned and funded.</p> <p>Ecosystem benefits services benefits for the ChEZ not identified and no assessment planned.</p>	<p>The Research and Environmental Protection center fully established, fully staffed, and functioning with a stakeholder driven research program.</p> <p>Comprehensive assessment of the current state and trends of natural ecosystems in the ChEZ.</p> <p>The status and potential in terms of ecosystem services, values, enhancement of carbon benefits and meeting LULUCF targets in the ChEZ is assessed.</p>	<p>Improved monitoring and research for large areas of forests, wetlands, and other habitat types and associated carbon benefits for the ChEZ.</p>
<p>Component 2 – Establishment and Management of a Full Protected Area Network</p> <p>Current amount of PA in the zone approx. 20% but low level of protection; legislation to expand PA in ChEZ not in place; assessment of carbon stocks and other natural capital in ChEZ incomplete in some cases and not undertaken in others; socio-economic surveys incomplete.</p>	<p>The ChEZ is upgraded to the status of Protected Area network to enhance the conservation and management of carbon stocks including development and implementation of a fire prevention and management plan, and secure the long-term basis for appropriate management, monitoring and research for large areas of forests, wetlands and other habitat types</p> <p>Enhanced financial and institutional sustainability of multi-sector conservation programs</p>	<p>Enhanced conservation and sustainable management of natural resources and carbon stocks in large areas of forested and non-forested lands, including wetlands and other habitat types within the ChEZ</p>
<p>Component 3 – Learning/Field Testing/Dissemination</p> <p>Substantial knowledge gaps exist, and what does exist is scattered which makes access and availability difficult.</p>	<p>A set of lessons learned and best practices recommended and published on habitat rehabilitation, carbon stocks management and biodiversity conservation from prior and ongoing work in the ChEZ, and applicable to similar situations</p> <p>Project results widely disseminated, nationally and internationally.</p>	<p>Existence of a comprehensive data base stored in the REPC.</p>

3.8 Sustainability

151. Sustainability will be ensured through the involvement in project execution of existing relevant national bodies (ref. section 2.5 and section 4), which will see their technical capacity enhanced as a

result of the GEF project. These existing institutions are expected to continue to operate after project completion, and their co-financial contribution to project activities is also a promising signal of the likelihood of long-term sustainability of project interventions.

152. Most notable is the US\$ 12.1 million commitment from the Ukraine MENR to create and maintain the expanded protected area network (Biosphere Reserve) in the ChEZ. Sustainability will also be enhanced through development of collaboration with the neighboring Polesky Reserve in Belarus, and though work undertaken in Component 3 of the project, specifically work involving the recruitment of trainers to assist in the dissemination of lessons learned and overall dissemination of project results at national, regional and international levels.

153. Another key element of sustainability is the envisioned creation of an Environmental Protection Center, which would serve a number of functions related to sustainability, including, among others, a repository for and source of information regarding lessons learned from research and other activities within the zone over the twenty-seven years since the accident and continuing research on issues related to the growing and globally significant biodiversity within and immediately around the ChEZ. It would also be the repository for existing and future ChEZ scientific reports and research efforts which would be electronically available to all stakeholders at local, national, regional and international levels. The Center would also be the driving force in developing a research program for future technical and scientific endeavors in the zone, and serve an important coordination function with relevant national and international institutions.

154. The BioCarbon Fund Feasibility Study, as described in Section 2.4, clearly underlines that the sustainable forest management approaches that will be promoted through this project in the ChEZ will have a significant potential for replication in the rest of Ukraine. Carbon sequestration and voluntary carbon trade schemes were also assessed as having a clear potential in supporting government policy, indicating, as described in Government policy that "...Forestry is probably the most economically, environmentally and socially desirable and sustainable land use in the areas intended for reforestation."

155. The value for Ukraine of implementing the Study has been establishment of a precedent for carbon trade associated with biological sequestration that allows for significantly larger bilateral agreements to be realized, while also building the necessary awareness, experience and technical capacity of key Ukrainian forest sector actors needed to enable the country to pursue such opportunities. It also is consistent with the realization that: "...Radioactive material is present in green rather than woody plant matter and grass fires in non-forested abandoned agricultural lands can lead to dispersal of radioactive material to productive agricultural lands and settlement areas nearby" and that "Forested areas are less fire prone and dispersal of radioactive material from fires occurring in forests is greatly limited by the presence of the trees and the forest canopy." The Study has led to the recognition that reforestation combined with appropriate fire monitoring and control measures "would not only sequester carbon from the atmosphere, but would also reduce the distribution of low level radioactive contamination, as well as the contribution of carbon to the atmosphere from fires."

3.9 Replication

156. The nuclear accident that occurred at Fukushima is indicative of the need to collect, synthesize, and make available at global level the experience that has been gained over the past 28 years in and around the Chernobyl area. Most observers agree that there will be further nuclear accidents, the only questions are when, where, and what will be the severity of these future accidents. The project design makes explicit provision for the involvement of relevant international research and other organizations, some of which will undoubtedly be involved in the peer review of scientific studies that

will be undertaken during project implementation and will have access to published research and a compilation of lessons learned as a result of the project.

3.10 Public awareness, communications and mainstreaming strategy

157. The project aims to expand current use of the ChEZ to encompass ecosystem values and in so doing provide ecosystem services to the benefit of local, national and international stakeholders. Biodiversity focused management is to be mainstreamed into the public sectors responsible for the use and management of the natural resources of the ChEZ. In order to do this in a sustainable way, project involvement and support of social and stakeholder engaged processes will be ensured where science and policy work together to allow for the uptake of the results of the project.

158. The project consists of local, national and international scale activities which will contribute to developing and implementing an expanded protected area network in the ChEZ, and accompanying management processes in the context of a governmental commitment to expand current productive uses in the ChEZ to the social, economic and environmental benefit of all stakeholders. Of key importance to the mainstreaming of project results will be the participation and ownership of stakeholders in this project. In order to facilitate this participation, close communication channels between project managers, governmental ministries, agencies and departments, scientists, at national and international levels, will be established. This communication will inform scientists as they strive to fill important data and information gaps, while communications between scientist and stakeholder will ensure buy-in and ownership. At project outset, a Communications Strategy will be developed, to support the achievement of the project's Goal and key outcomes. The Strategy will therefore underpin and complement the objectives of each project component of the project, as outlined below.

159. The primary objective of Component 1 is creation of a Research and Environmental Protection Center which will take the lead in efforts to collect and synthesize existing research, undertake a gap analysis, and develop and implement a research program consistent with Component 2 of the project. The Center will become the repository for existing and planned future research efforts. The Center would also serve to ensure that target audiences could access and use this research consistent with their needs. The results of the Center's research efforts will be an important communication and mainstreaming product of this component.

160. Component 2 is specifically targeted to the creation and management of a new protected area network that in turn will maintain and protect carbon stocks in large areas of forest and non-forest lands, including wetlands and other habitat within the ChEZ. This component will include a wide reaching dissemination strategy to secure participation, build and strengthen partnerships, and overall help develop an understanding and appreciation for the social, economic, and environmental benefits that will accrue to the ChEZ and surrounding area as a result of the new protected area network. More specifically, a communication and mainstreaming strategy aimed at ensuring the participation of decision makers tasked with development policy and poverty alleviation programs will be built and implemented in order to ensure alignment of their programs with the aims of sustainable ecosystem management. Civil society engagement will include informal presentations and media communications on the project and its relevance to society at large.

161. Component 3 is the key component that will ensure mainstreaming of project results. The communication process will include traditional scientific publications to demonstrate the credibility and applicability of project results. It will also be characterized by efforts to repatriate the many studies that have been conducted by individuals and institutions from other nations but which have not been shared with Ukraine. The participation of international scientific organizations in project activities will facilitate the communication of results as well as help in ensuring replication in other

areas as necessary. Lessons learned will be made widely available through written reports, the project website, and through training manuals developed and distributed by the Research and Environmental Protection Center.

3.11 Environmental and social safeguards

162. The project strategy and approach aims to achieve both positive environmental and social impacts, through a focus on assisting the government to develop and implement a triad approach to the long-term management of the resources within the ChEZ. This will lead to a combination of developing economic opportunities within and around the zone and simultaneously facilitating the valuation and integration of ecosystem services into sectoral and developmental planning and policy processes. The project takes into consideration the gender relations and will ensure that there is fair representation of both women and men in the project, its activities and its results. It should be noted that many of the government officials, academic experts and NGOs that have been involved during the project preparation, and will continue to be involved in the project implementation, are women. Further, one of the most important NGOs that work for the project during preparation is MAMA-86. While it is not possible to know the exact makeup of the estimated 300 positions that would be necessary for management of the new protected area, every indication is that a substantial portion would be women. Further baseline data and information collected during the project implementation concerning the socio-economic aspects will be gender-disaggregated where possible.

163. Factoring ecosystem services into planning and decision making at multiple scales will contribute to raising the value that can be attributed to ecosystem use and thus increase the appreciation of biodiversity conservation by multiple stakeholders. Continuing, targeted research, continued development of mapping tools, and development of scenarios of possible futures will allow for a further integration of environmental considerations into sectoral and developmental policies.

164. The project also aims to develop capacities of decision makers, users and beneficiaries of ecosystem services to assess trade-offs and development choices that contribute to strengthened biodiversity, ecosystem resilience, and capacity for carbon sequestration to develop and apply appropriate ecosystem management tools within sectoral planning frameworks and macroeconomic planning models.

165. The multi-scale approach of the project will be further guided by considerations of equitable access to ecosystem services. Unless equity and fairness issues are explicitly addressed, response strategies have a high likelihood of failing to meet the objectives of reversing ecosystem services decline. Institutional reforms and incentives might be required to minimize the risk to equity and fairness. Decisions on ecosystem use options will take into account the values of all services for the various dimensions of human well-being across the entire stakeholder landscape, so as to develop equitable and pro-poor development choices that incorporate sustainable ecosystem usage concerns.

166. Required Tables related to Environmental and Social Safeguards appear later in this project document as Appendix 12.

SECTION 4. INSTITUTIONAL FRAMEWORK/IMPLEMENTATION ARRANGEMENTS

167. The United Nations Environment Programme (UNEP) will implement the Project and bring to bear its combined body of scientific and empirical experience of critical relevance to the objectives of the project. The UNEP through its Regional Office for Europe (ROE) maintains an active programme of collaboration with Ukraine and leads the work of the Environmental pillar of the UN Development Assistance Framework (UNDAF) in Ukraine.

168. **UNEP's Division of Environmental Policy Implementation (DEPI), as the GEF Implementing Agency** for this Project will provide: overall coordination of the activities of national, and any international partners; technical and scientific expertise and enhancement of regional and international cooperation. UNEP will be responsible for the overall project supervision to ensure consistency with GEF and UNEP policies and procedures and will provide guidance on linkages with related UNEP and GEF-funded activities. UNEP will also monitor implementation of the activities undertaken during the execution of the project and will provide the overall coordination and ensure that the project is in line with the UNEP Medium-Term Strategy and its Programme of Work (PoW), as approved by the UNEP Governing Council.

169. More specifically UNEP shall:

- Provide project oversight to ensure that GEF policies and criteria are adhered to and that the project meets its objectives and achieves expected outcomes in an efficient and effective manner. Project supervision is entrusted to the UNEP/GEF Task Manager and Fund Management Officer. Project supervision missions by the Task Manager and/or Fund Management Officer will be stipulated in the project supervision plan to be developed during project appraisal phase. Enter into an Execution Agreement with Bioversity International as the lead executing agency for the provision of services to the project;
- Have a representative on the project steering committee; Report to the GEF Secretariat on the progress against milestones outlined in the CEO approval letter;
- Inform the GEF Secretariat whenever there is a potentially substantive co-financing change (i.e. one affecting the project objectives, the underlying concept, scale, scope, strategic priority, conformity with GEF criteria, likelihood of project success, or outcome of the project);
- Report to the GEF Secretariat on the progress against milestones outlined in the CEO approval letter;
- Inform the GEF Secretariat whenever there is a potentially substantive co-financing change (i.e. one affecting the project objectives, the underlying concept, scale, scope, strategic priority, conformity with GEF criteria, likelihood of project success, or outcome of the project);
- Be responsible to submit the overall annual Project Implementation Review report to the GEF Secretariat and Evaluation Office and rate the project on an annual basis in terms of progress in meeting project objectives, project implementation progress, risk, and quality of project monitoring and evaluation, and report to the GEF Secretariat through the Project Implementation Review (PIR) report;
- Review and clear manuscripts prepared by the Executing Agency before publication, and review and agree any publishing contracts;
- Undertake a mid-term management review of the entire project or request the Evaluation and Oversight Unit (EOU) to perform an independent mid-term evaluation;
- Ensure that EOU of UNEP arrange for an independent terminal evaluation and submits its report to the GEF Evaluation Office;
- As deemed appropriate, facilitate access to information, advisory services, technical and professional support available to UNEP and assist the Executing Agency to access the advisory services of other United Nations Organizations, whenever necessary; and
- Manage and disburse funds from GEF in accordance with the rules and procedures of UNEP.

170. The UNEP Regional Office for Europe (UNEP-ROE) in close collaboration with the Ministry of Ecology and Natural Resources (MENR), the Agency responsible for the management of the Chernobyl Exclusion Zone will be the **Project Executing Agency**.

171. UNEP-ROE will be responsible for the overall execution of the project and will provide appropriate support and technical expertise as required by the MENR and project partners in accordance with the objectives and key activities outlined in Section 3 of this document. UNEP-ROE

will assign its Regional Coordinator for projects and activities in Eastern Europe (as cash contribution to the project) to act as Project Director and lead the overall project execution towards the objectives outlines in Section 3 of this document. An Associate Programme Officer will be appointed in UNEP-ROE to assist the Project Director with daily oversight of project execution, as well as to provide backstopping to the Project Management Unit to be based in the UN premises in Kiev. The project will rent an office space in the UN common project facility in Ukraine. Project procurement and disbursements in Ukraine will be undertaken through the UNDP Country Office in Ukraine.

172. A full-time National Project Manager will be appointed by UNEP-ROE to be in charge of all aspects of project implementation at national level, lead the project team and coordinate with Government stakeholders to ensure the delivery of the expected project outputs.

173. **Project Management Unit (PMU)** will be established in Kiev, Ukraine under the overall supervision of the UNEP Project Director and the direct supervision of the National Project Manager. The PMU will consist of the National Project Manager, Administrative Assistant and thematic consultants (on a needs basis). The TORs for staff in the PMU are provided in Appendix 9. The core PMU staff will work in tandem with designated staff of the MENR, the Agency for Management of the Exclusion Zone, the Chernobyl Research Center, staff other relevant government ministries and agencies, and researchers and research institutions at national and international level.

174. Further, the PMU will be assisted by the UNEP Division of Environmental Policy Implementation (DEPI), through several of its units/branches, including the UNEP/DEPI Terrestrial Ecosystems Unit (TEU - Nairobi) and its Forest team; the GEF BD/LD/BS Unit (Nairobi) and the Ecosystem Services Economics Unit (ESE - Nairobi).

175. The PMU will serve as the critical link between the project pilot sites, the different groups engaged in project activities and the lead Project Executing Agency, to ensure that lessons learned are shared among sites and within national committees and to provide visibility of the project at the national and international level. The PMU and UNEP-ROE will be responsible for ensuring adequate communication of information to all national and international partners.

176. The execution of the project at site level will be supported by local extension staff who will act as site coordinators. They will have responsibility for ensuring that there is good communication between sites and the national PMU and that within each site the required links and collaborative arrangements are developed to support e.g. collaboration between farmers, between communities and between communities and local markets.

177. The PSC's role will include:

- Advice and guidance to the project at policy level based on evaluation of progress and achievements reported from project partners via the PCU;
- Ensuring synergy between project activities and national, regional and international partner activities to minimize overlap and maximize mutual benefits arising from project and partner activities through coordination of the roles of the organizations they represent; and
- Ensuring that strategic decision-making therein is made with due consideration of the project's activities and objectives.

178. The Project Steering Committee will consist of representatives of the main project partners including:

- Representatives of the Government;
- UNEP GEF Programme management officer;
- Representative of the Executing Agency: UNEP/ROE; and

- Other members as may be decided by the PSC.

179. It is expected that other key government ministries and agencies, to be determined by the PSC, will be added to the PSC.

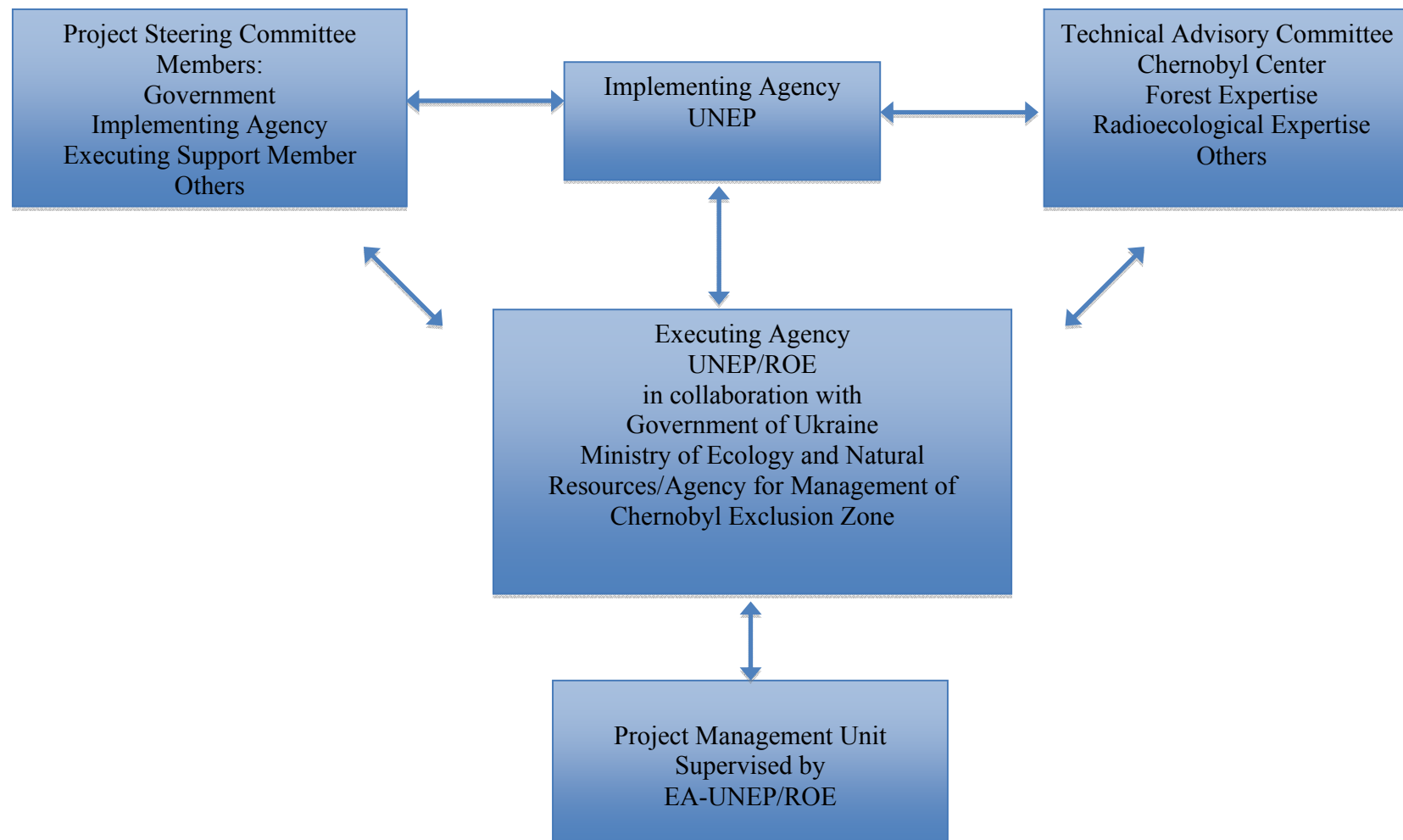
180. The Task Manager will represent UNEP/GEF, and the Executing Agency member will be appointed by the Executing Agency. PSC Members will be formally appointed at the start of the project by the respective organizations.

181. There will be a Technical Advisory Committee (TAC) comprised of national, regional and international scientists and other technical experts. The Project Manager will select members of the TAC in consultation with the SC Chair (MNRE), and will report on the activities of the TAC to the Project Steering Committee. The Committee will be responsible for providing scientific and technical advice to the project and will also maintain continuous contact with scientific and other technical stakeholders at national, regional, and international levels. The TAC may, at its discretion and consistent with available resources, strike specific sub-committees of experts to peer review ongoing or completed project activities, and may assist, at the request of the Project Manager, in monitoring and evaluation activities. To ensure effective coordination with, and responsiveness to the Project Coordination Unit, the Project Manager shall also be a member of the Technical Advisory Committee. The TAC will appoint a Chairman at its inaugural meeting.

182. Last, external UNEP partners, including, among others, the IAEA, the Polessky Nature Reserve, Yale University, The U.S. Forest Service (through the U.S. Agriculture Department), the UNEP- WCMC (World Conservation Monitoring Center), the Global Fire Monitoring Network, the UN WILDFIRE Network and the United Nations University that have conducted and/or will conduct significant relevant work in Ukraine with several national and international research institutions, will be involved in in project execution while also being invited to membership on the Technical Advisory Committee.

183. The project organogram appears below.

Project Organogram



SECTION 5. STAKEHOLDER PARTICIPATION

184. The project provides excellent opportunity to involve government ministries and agencies at local and national levels, as well as national, regional and international academic and research institutions, the private sector, NGOs and other stakeholders. They will work together under the leadership of the MENR and coordinated by the PMU to fill knowledge gaps and participate in the successful creation and management of a protected area network in and around the ChEZ with a view to its long-term sustainable management through their involvement in project activities and associated capacity building. Science results will be disseminated in understandable language among resource users and managers, enabling translation of those results into management action.

Stakeholder Participation Assumptions

185. Stakeholder participation in this project also assumes that successful public participation must emphasize two-way communication. It is important that the project communicate information that will be generated by the project effectively to stakeholders. But it is also important that the project take note of, and be able to incorporate into the expanded protected area management plan the substantial amount of information that can be contributed by the various stakeholders to those responsible for project implementation and to governments. Several assumptions underlie the approach being taken as part of this Plan. They include a need to:

- Understand that knowledge empowers people and that shared knowledge based on sound principles and solid information can contribute to better governance and sustainable natural resource management, thereby contributing to poverty alleviation through the empowerment of groups and individuals;
- Recall that successful public participation must emphasize effective multiple pathways of communication between and among the project, governments at all levels (local, national, regional and international), and stakeholders;
- Increase access of local communities and other stakeholders to information that is critical to environmental management and sustainable livelihood creation;
- Translate the outputs from the science investigations into management action, through mass education, targeted environmental education, and awareness building among stakeholder communities;
- De-mystify the science that is an inescapable part of our attempts to sustainably manage marine ecosystems;
- Assure broad stakeholder participation in Project and Program activities and outputs, with special emphasis on development; and
- Assist governments through a program of not only creating, but also sustaining broad stakeholder support to adaptively manage these complex systems.

Stakeholder Participation Principles

186. The following table describes the principles that the project will adopt during implementation.

Table 13. Stakeholder Principles and Application

Principle	Stakeholder participation will:
Understanding of the varying social and cultural milieus of the region	Include a broad array of stakeholders and thus capture essential knowledge for project use and for dissemination
Value-added	Be an essential means of adding value to the project
Inclusiveness	Include all relevant stakeholders
Accessibility	Be accessible and promote access to the process
Transparency	Be based on transparency and fair access to information
Fairness	Ensure that all stakeholders are treated in a fair and unbiased way
Accountability	Be based on a commitment to accountability to and by all stakeholders

Constructive	Seek to promote the public interest in a constructive manner
Redressing	Allow for identification of inequities and identification of potential means to address them
Capacity Building	Seek to develop the capacity of all stakeholders
Flexibility	Be flexibly designed and implemented
Rational and Coordinated	Be rationally planned and coordinated at all levels, not <i>ad hoc</i>
Excellence	Be subject to ongoing reflection and improvement through monitoring and evaluation

187. Key active stakeholders in furthering and promoting the objectives of the project, and benefiting from its results, are already identified in Section 2.7. The project will actively continue to engage them in project activities, including in a formalized advisory capacity as part of the overall project management structure. Further, stakeholders will be involved in project activities interactively through use of a dedicated project website and through other communication venues, including social media.

Levels of Stakeholder Participation

188. As previously stated there are no legal inhabitants within the ChEZ. Notwithstanding this absence, the project will from the outset develop and implement a communication and outreach strategy to the general public at the different geographical scales (local, regional and national). This strategy will make use of different media and formats to disseminate project information and results. The strategy will follow a systematic approach to the definition of key messages to targeted publics at each of the three geographic levels. Crucial in this strategy will be the detailed knowledge that already exists about the human (social, cultural, economic, etc.) characteristics of the diverse stakeholders, most of whom have been involved in and/or communicated with during preparation. It is expected that this knowledge will inspire innovative and appropriate means for participation in project implementation itself and for the dissemination of information.

189. Local level involvement will focus on the oblasts in the immediate vicinity of the ChEZ, including the Slavutych City State oblast and the Zhytomyr oblast State, and Ovrutsky Rayon administration of Zhytomyr oblast Administrations. The populations of these oblasts, where employment opportunities continue to be scarce, will benefit from the roughly 300 jobs that would be created (preliminary estimate of the MENR) as a result of the expanded protected area network in the ChEZ. The project would assist, through its web site and through other appropriate communications avenues, to communicate information on the social and economic benefits to be derived from the expanded and strengthened protected area system. Populations in the vicinity of the ChEZ would also be continuously informed of and involved in implementation activities through the various communications mechanisms that will be developed by the project as part of the Communication Strategy.

190. National level public awareness and communications will be secured through a combination of government agencies and NGOs. Government agencies were directly and productively involved during preparation, and this involvement will continue during implementation, through membership on one or more project groups such as the Project Steering Committee, the Technical Advisory Group, and other advisory and working groups that may be formed as implementation moves forward. Key governmental and quasi-governmental entities include (ref. also section 2.5 above):

- The Ministry of Ecology and Natural Resources, and, within the Ministry, the Department of Nature Protection;
- The Agency for the Management of the Chernobyl Exclusion Zone, and its sub-agencies the Chernobylska Puscha Forestry Department, the Chernobyl Radioecological Center, the Chernobylvodekspluatatsia, and the Chernobyl Center for Nuclear Safety, Radioactive Waste and Radioecology;
- The State Ecological Academy (SEA);
- The State Environmental Investment Agency;
- The Drevliansky Nature Reserve;
- The State Forestry Resources Agency;

- The Kyiv oblast State Administration;
- The Kyiv oblast Department for Environmental Protection;
- The Slavutych City State Administration;
- The Zhytomyr oblast State Administration;
- The Academy of Sciences Ukraine, and its Institutes of plant physiology and genetics, zoology, botany and molecular biology;
- The Institute of Agricultural Radiology of the National University of Life and Environmental Sciences;
- The Zhytomyr Agroecological University; and
- The Institute of Forestry and Forest Melioration (Kharkiv).

191. Regional level public awareness and communication will come of the formalized effort to create working linkages between the envisioned, expanded protected area system in and around the ChEZ and the adjoining Polesky Nature Reserve in Belarus. The first step in achieving coordination and communication between the two protected area networks took place during project preparation, and there is a commitment on the part of both countries to continue building working relationships during project implementation. During implementation the work undertaken during preparation will be augmented through bi-lateral meetings, joint trainings and workshops, common work and research agendas, and the invitation to Polesky Nature Reserve personnel to participate in work of the project through the stakeholder advisory committee and the technical advisory group.

192. International level involvement will also include a number of international entities that participated in or were consulted during project preparation. This level of project involvement is seen as essential for the development of a forest fire management plan that will be developed in coordination with the Polesky Nature Reserve in Belarus and will incorporate best practices gathered from experiences around the world. International entities will also be an important resource for disseminating lessons learned, best practices, and results of peer reviewed scientific research through international publications and other communications venues such as news releases, short films, seminars and conferences, and social media. International organizations that have already been involved in project preparation activities, and will be included during project implementation include, among others:

- The Global Fire Monitoring Center;
- Yale University;
- The U.S. Forest Service;
- The Government of Japan and other national governments;
- A broad range of UN agencies including, among others, UNEP, UNDP, IAEA, WHO, UNSCEAR, and UN-OCHA;
- The European Union; and
- The World Bank.

193. As with stakeholders at regional level, international stakeholders will participate in work of the project through the stakeholder advisory committee and the technical advisory group.

Stakeholder Participation Approaches

194. The project will continue to refine its initial stakeholder analysis during project implementation. Project communications will be framed within a project communications strategy that will be developed at project outset and that will guide implementation of all communication and outreach efforts, which may include i.e.: a project website; web-based information sharing tools; on-line discussion forums; project newsletter; project press releases; development of video clips for distribution to visual media outlets; regional/national/local meetings and symposia; local/national working groups; e-mail listserves/group e-mail lists; development and distribution of local, national and regional lessons-learned; meetings and consultations; the use of social media; international workshops; and training and capacity building (TCB) partnerships.

Stakeholder Participation Implementation and Maintenance

195. The Project Management Unit will be key to implementing the early stages of public participation activities. As the Research and Environmental Protection Center is developed and becomes fully

functional, seen to occur after year 2 of project implementation, it will become the vehicle to ensure continuity and sustainability of participation activities related to the protected area network.

Stakeholder Participation during preparation

196. Stakeholder consultation during project preparation was an ongoing process and included a project preparation workshop, jointly sponsored by the MENR and UNEP, and electronic solicitation of comments and suggestions from a broad array of existing and potential stakeholders. Conclusions and recommendations of the MENR sponsored stakeholder consultation meeting, and the electronic solicitation included, among others:

- A strong willingness of the Ukraine Academy of Science to become involved in all stages of project implementation;
- Willingness of the Global Fire monitoring Center to become heavily involved on the issue of forest fire prevention and management within the ChEZ and the Polessky Nature Reserve in Belarus;
- In outlining activities of ENVSEC in the area, including plans for radiological investigations in the area of Ukraine-Belarus border, the importance of cross-border cooperation was stressed and strongly supported;
- In observing that there is a substantial level of knowledge and expertise in organizations that have worked in the exclusion zone, the importance of synthesis of existing work, and its availability was stressed; and
- The Chernobyl Center suggested that simultaneous work in three main directions should take place: the creation of the reserve; establishment of a Center that would provide scientific guidance; and preparation of necessary legal acts that would change the Chernobyl zone legislation as needed to accommodate the nature reserve.

SECTION 6. MONITORING AND EVALUATION PLAN

197. The project will follow UNEP standard monitoring, reporting and evaluation processes and procedures. Substantive and financial project reporting requirements are summarized in Appendix 8. Reporting requirements and templates are an integral part of the UNEP legal instrument to be signed by the executing agency and UNEP.

198. The project M&E plan is consistent with GEF Monitoring and Evaluation policy. The Project Results Framework presented in Appendix 4 includes SMART indicators for each expected outcome as well as mid-term and end-of-project targets. These indicators along with the key deliverables and benchmarks included in Appendix 7 will be the main tools for assessing project implementation progress and whether project results are being achieved. The means of verification and the costs associated with obtaining the information to track the indicators are also summarized in Appendix 7. Other M&E related costs are also presented in the Costed M&E Plan and are fully integrated in the overall project budget.

199. The M&E plan will be reviewed and revised as necessary during the project inception workshop to ensure project stakeholders understand their roles and responsibilities vis-à-vis project monitoring and evaluation. Indicators and their means of verification may also be fine-tuned at the inception workshop. Day-to-day project monitoring is the responsibility of the project management team but other project partners will have responsibilities to collect specific information to track the indicators. It is the responsibility of the Project Manager to inform UNEP of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely fashion.

200. The Project Steering Committee will receive periodic reports on progress and will make recommendations to UNEP concerning the need to revise any aspects of the Results Framework or the M&E plan. Project oversight to ensure that the project meets UNEP and GEF policies and procedures is the responsibility to the Task Manager in UNEP-GEF. The Task Manager will also review the quality of draft project outputs, provide feedback to the project partners, and may establish peer review procedures to ensure adequate quality of scientific and technical outputs and publications.

201. At the time of project approval limited baseline data are available. Further baseline data collection, synthesis and gap analysis will be among the first activities undertaken during project implementation. It is expected that baseline data gaps will be addressed during the first year of project implementation, coordinated by the PMU, and will involve relevant government agencies, national level consultants, and, to a lesser degree, international consultants and organizations and institutions that have generated research in the ChEZ. A plan for collecting the necessary baseline data is presented as part of Appendix 5. Workplan and Time table Baseline data collection is specifically addressed in Outputs 1.1, 1.2 and 1.3.

202. Project supervision will take an adaptive management approach. The Task Manager will develop a project supervision plan at the inception of the project that will be communicated to the project partners during the inception workshop. The emphasis of the Task Manager supervision will be on outcome monitoring but without neglecting project financial management and implementation monitoring. Progress vis-à-vis delivering the agreed project global environmental benefits will be assessed with the Steering Committee at agreed intervals. Project risks and assumptions will be regularly monitored both by project partners and UNEP. Risk assessment and rating is an integral part of the Project Implementation Review (PIR). The quality of project monitoring and evaluation will also be reviewed and rated as part of the PIR process. Key financial parameters will be monitored quarterly to ensure cost-effective use of financial resources. Monitoring will also include periodic assessments of the project's performance in relation to the environment and social safeguards put in place by GEF Implementing Agencies.

203. A mid-term management review, managed by the UNEP Task Manager or an external and independent mid-term evaluation will take place in Project year 3, as indicated in the Project milestones. The Project Manager and partners will participate actively in the process. The purpose of

the Mid-Term Review (MTR) or Mid-Term Evaluation (MTE) is to provide an independent assessment of project performance at mid-term, to analyze whether the project is on track, what problems and challenges the project is encountering, and which corrective actions are required so that the project can achieve its intended outcomes by project completion in the most efficient and sustainable way. The project Steering Committee will participate in the MTR or MTE and develop a management response to the evaluation recommendations along with an implementation plan. It is the responsibility of the UNEP Task Manager to monitor whether the agreed recommendations are being implemented. An MTR is managed by the UNEP Task Manager. An MTE is managed by the Evaluation Office (EO) of UNEP. The Evaluation Office of UNEP will determine whether an evaluation is required or whether a mid-term review managed by the UNEP TM is sufficient.

204. An independent terminal evaluation (TE) will take place at the end of project implementation. The EO will be responsible for the TE and liaise with the UNEP Task Manager throughout the process. The TE will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. It will have two primary purposes:

- (i) to provide evidence of results to meet accountability requirements, and
- (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP and executing partners.

While a TE should review use of project funds against budget, it would be the role of a financial audit to assess probity (i.e. correctness, integrity etc.) of expenditure and transactions.

205. The TE report will be sent to project stakeholders for comments. Formal comments on the report will be shared by the EO in an open and transparent manner. The project performance will be assessed against standard evaluation criteria using a six point rating scheme. The final determination of project ratings will be made by the EO when the report is finalized. The evaluation report will be publically disclosed and will be followed by a recommendation compliance process.

206. The direct costs of reviews and evaluations will be charged against the project evaluation budget.

207. The GEF tracking tools are attached as Appendix 14. These will be updated at mid-term and at the end of the project and will be made available to the GEF Secretariat along with the project PIR report. The mid-term and terminal evaluations will verify the information of the tracking tool.

SECTION 7. PROJECT FINANCING AND BUDGET

7.1 Overall Project Budget

208. The overall budget for the project is US\$33,203,955 comprising US\$4,863,955 from GEF and US\$28,340,000 from co-financing. Details of the budget according to UNEP budget lines are attached as Appendix 1 and Appendix 2.

Table 14. Financial summary

	Baseline	Increment	Alternative	GEF	Co-financing
Component 1	8,200,000	11,261,000	19,461,000	1,621,000	9,640,000
Component 2	3,900,000	9,494,000	13,394,000	1,854,000	7,640,000
Component 3	0	5,909,757	5,909,757	669,757	5,240,000
Component 4 M&E	0	3,156,000	3,156,000	476,000	2,680,000
Component 5 Management	0	3,383,198	3,383,198	243,198	3,140,000
Total	\$12,100,000	33,203,955	45,303,955	4,863,955	28,340,000

7.2 Project co-financing

209. A total of US\$ US\$28,340,000 is committed as co-finance from 3 sources. Of this, US\$17,390,000 is in cash and US\$10,950,000 in-kind. The breakdown per project component activities is given in Appendix 2. The co-finance committed to the project includes two elements: commitment from national partners and commitment from international partners that are not country-specific. The sources and type of co-financing mobilized is indicated in the table below.

Table 15. Co-financing by sources and component in USD

<i>Name of Co-financier (source)</i>	<i>Classification</i>	<i>Cash</i>	<i>In Kind</i>
Component 1			
Ministry of Ecology and Natural Resources (MENR)	Nat'l Gov. Exec Agency	6,620,000	3,000,000
Global Fire Monitoring Center	International Organization	10,000	10,000
UNEP	Implementing Agency	0	0
Subtotal		6,630,000	3,010,000
Component 2			
Ministry of Ecology and Natural Resources (MENR)	Nat'l Gov. Exec Agency	4,620,000	3,000,000
Global Fire Monitoring Center	International Organization	10,000	10,000
UNEP	Implementing Agency	0	0
Subtotal		4,630,000	3,010,000

Component 3			
Ministry of Ecology and Natural Resources (MENR)	Nat'l Gov. Exec Agency	3,120,000	2,000,000
Global Fire Monitoring Center	International Organization	0	0
UNEP	Implementing Agency	0	120,000
Subtotal		3,120,000	2,120,000
Component 4			
Ministry of Ecology and Natural Resources (MENR)	Nat'l Gov. Exec Agency	1,120,000	1,500,000
Global Fire Monitoring Center	International Organization	0	0
UNEP	Implementing Agency	0	60,000
Subtotal		1,120,000	1,560,000
Component 5			
Ministry of Ecology and Natural Resources (MENR)	Nat'l Gov. Exec Agency	1,820,000	1,200,000
Global Fire Monitoring Center	International Organization	0	0
UNEP	Implementing Agency	70,000	50,000
Subtotal		1,890,000	1,250,000
TOTAL		17,390,000	10,950,000

7.3 Project cost-effectiveness

210. The favorable co-finance to GEF ratio (approaching 5.8:1) is a clear demonstration of strong project support on the part of the Government and represents a relatively small incremental cost while achieving significant biodiversity and CCM-5 related benefits as described in paragraph 114 and as demonstrated in Tables 5, 6 and 7 on Pages 41-42.

211. The project will work closely with existing government structures, national organizations, local stakeholders and regional and global stakeholders to share existing and future research efforts in the ChEZ. This approach is adopted to generate greatest possible synergies at all levels, and therefore maximizes cost-effectiveness. This approach will generate global benefits in terms of (a) positively contributing to the enhanced conservation status of an important ecosystem, and (b) will positively contribute to the on-going international dialogue on the consequences, remediation of, and future uses for contaminated areas as a result of a nuclear catastrophe. The coordinated approach among project activities at all levels, facilitated by the UNEP/DEPI and Project Steering Committee, will avoid duplication of activities and investment, maximize synergies with other relevant initiatives, and thus improve cost-effectiveness.

212. Again, for the modest incremental cost to the GEF the project has the potential to provide:

- The largest area in Europe without anthropogenic impact; and

- An opportunity to achieve substantial levels of carbon sequestration given the substantial forest base and peatlands.

213. More specifically, cost-effectiveness measures include:

- Building on existing programs and grassroots efforts at local, national, regional and international levels;
- Building on and adding to extensive experience and data that has been and will be generated as a result of project activities;
- Harmonizing activities and creating synergies with and among all relevant stakeholders; and
- Targeting a broad range of stakeholders through existing local, national, regional and global networks, so as to maximize lessons learned and creation of a centralized data base that will be available to all interested individuals, organizations and governments.