



វេទិកាអនាគត
Future Forum

Policy Brief: Agriculture and Deforestation

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Introduction

Agriculture and forestry are inextricably linked, principally via their direct competition for scarce land. Agriculture supports the livelihoods of millions of smallholder families and is at the core of national policies to diminish rural poverty.² However, the demand for agricultural land is a primary factor in deforestation and land degradation.³ This tradeoff is critical since land-use change in the form of deforestation and degradation is a main driver of greenhouse gas emissions with concomitant impacts as regards climate change.⁴

In the context of Cambodia, policy aimed at lowering rural poverty levels in the short-term finds itself competing against the compounding effects of climate change in the long-run. Cambodia's vulnerability to climate change is primarily due to its geography; strong reliance on the agriculture sector; and low adaptive capacity, including limited financial, technical and human resources.⁵ This is exacerbated by the interconnected and competing economic opportunities

¹ This paper has been edited by Future Forum's in-house editorial team.

² United Kingdom. Department for International Development. *DFID's Conceptual Framework on Agriculture*. London: The Department, 2015. <https://www.gov.uk/government/publications/dfids-conceptual-framework-on-agriculture>.

³ Richard, McNally. "Landscapes for People, Food and Nature". *Understanding the relationship between Forests and Agriculture: the need for a landscape approach*. Updated January 2, 2015. <http://peoplefoodandnature.org/blog/understanding-the-relationship-between-forests-and-agriculture-the-need-for-a-landscape-approach/>

⁴ The International Institute for Environment and Development. *The interface between forests, agriculture and climate change: understanding the implications for REDD*. Updated 2010. <https://www.iied.org/interface-between-forests-agriculture-climate-change-understanding-implications-for-redd>

⁵ United Nations Climate Change. *Cambodia's Intended Nationally Determined Contribution*. 2015. <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Cambodia%20First/Cambodia%27s%20INDC%20to%20the%20UNFCCC.pdf>; Nang, Phirun. (2013) *Climate Change Adaptation and livelihoods in Inclusive Growth: A Review of Climate Change Impacts and Adaptive Capacity Cambodia*. Working Paper Series No. 82. Available at <https://cdri.org.kh/publication/wp-82-climate-change-adaptation-and-livelihoods-in-inclusive-growth-a-review-of-climate-change-impacts-and-adaptive-capacity-in-cambodia/>

and requirements of forestry and agriculture. In line with this, Cambodia requires urgent revision to its forestry policies to facilitate improved outcomes across both sectors and for overall national development.

Cambodian Agriculture

Cambodia has notable endowments of natural resources that facilitate comparative advantage in agricultural output in the context of global economic competition.⁶ Accordingly, 78 percent of Cambodia's population resides in rural-agricultural areas, and roughly 45 percent of the total labor force was directly involved in the agriculture sector in 2014.⁷

Agriculture is one of the main drivers of the Cambodian economy: although its contribution to overall GDP has declined from 55.6% in 1990 to about 23.38% in 2017. From 1993 to 2017 the average contribution as a percentage of GDP was 34.77%, as set out in figure one below.⁸

According to the Ministry of Agriculture Forestry and Fisheries, exports of agricultural products increased by eleven percent in 2017, with sliced cassava topping the list for most exported Cambodian commodity, with more than 2.83 million tons shipped abroad. This was followed by fresh cassava (936,984 tons), rice (635,679 tons), corn (168,685 tons), and cassava starch (76,093 tons).⁹ GDP from agriculture in Cambodia increased to 9401.20 KHR Billion in 2017 from 9240.60 KHR Billion in 2016. GDP derived from agriculture in Cambodia averaged 7211.92 KHR Billion from 1998 until 2017, reaching an all time high of 9401.20 KHR Billion in 2017 and a record low of 4756.90 KHR Billion in 1998.¹⁰

⁶ Ministry of Agriculture, Forestry and Fisheries and FAO Representation in Cambodia. *National Medium-Term Priority Framework: Cambodia*. Updated August 2, 2002. <http://www.fao.org/3/a-at648e.pdf>

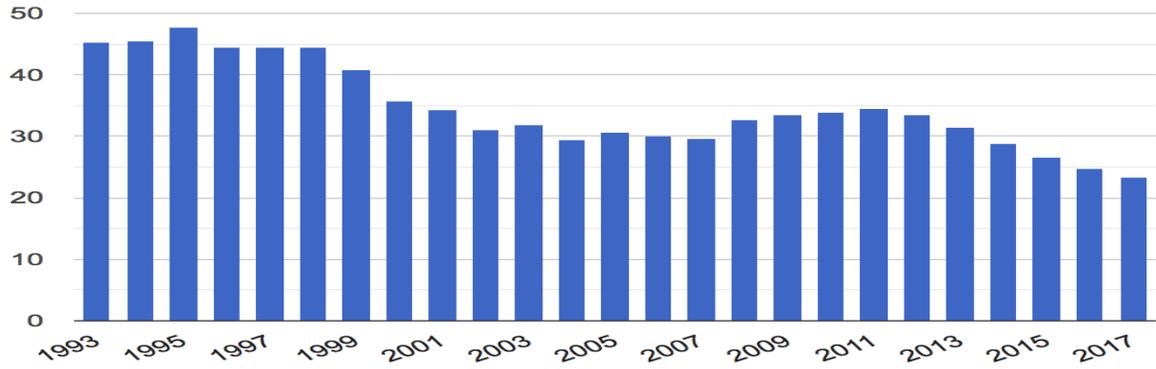
⁷ Export.gov. *Cambodia Commercial Guide: Cambodia-Agriculture Sector*. Updated January 2, 2018. <https://www.export.gov/article?id=Cambodia-Agricultural-Sector>

⁸ The World Bank. *Agriculture, forestry, and fishing, value added (% GDP)*. Updated 2019. <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=KH>

⁹ Sok, Chan. "Agricultural exports grew by 11 percent last year." *The Khmer Times*, February 13, 2018. <https://www.khmertimeskh.com/50108283/agricultural-exports-grew-11-percent-last-year/>

¹⁰ Trading Economics. *Cambodia GDP From Agriculture | 2019 | Data | Chart | Calendar | Forecast*. Updated 2019. <https://tradingeconomics.com/cambodia/gdp-from-agriculture>

Figure One: The Contribution of Cambodian Agriculture 1993-2017 (% of GDP)



Source: the World Bank

Cambodian Forestry

Forests are equally essential for the protection of rural communities and a healthy environment. They serve as an indispensable source of livelihood for many of Cambodia’s poorest and accordingly feature as a key mechanism for change within poverty-alleviation strategies.¹¹ According to a 2016 Ministry of Environment assessment, Cambodian forestry covers an area of 8.742.401 ha; equivalent to 48.14% of the country’s total land area (see figure two). This includes traditional forestry area as well as forest land used for palm oil plantations, rubber plantations and other perennial crops¹².

¹¹ Sanara, Hor and others. “The Impact of Agricultural Expansion on Forest Cover in Ratanakiri Province, Cambodia. *Journal of Agricultural Science* 6, no. 9 (August 2014): 46-59.

¹² Ministry of Environment. Cambodia Forest Cover 2016. Updated March 1, 2018. https://redd.unfccc.int/uploads/54_3_cambodia_forest_cover_resource_2016_english.pdf

Figure Two: Cambodia’s Land Use



Source: Cambodian Ministry of Environment

Cambodia has historically sustained a high level of forest cover, one of the highest in Southeast Asia.¹³ However, across the last two decades Cambodia has lost a considerable volume of forest as the pace of forest conversion to alternative land use has escalated at an historically unprecedented rate.¹⁴ According to Forest Trends, Cambodian forest cover decreased from 73 per cent in 1993 to between 55 and 60 per cent in 2015.¹⁵ The rate of forest cover loss between 2006 and 2010 was 2.09%: an average annual change of 0.52%. However this change rate significantly surges between 2010 and 2014, at an average annual rate of 2.66%: around 10.65% loss of the total (see figure 3). That surge has recently subsided. These trends of deforestation have been very much exacerbated by increasing demand for productive agricultural land. For instance, in the northeastern Cambodian province of Ratanakiri, agricultural expansion has been a remarkable factor in the decline of forest coverage.¹⁶

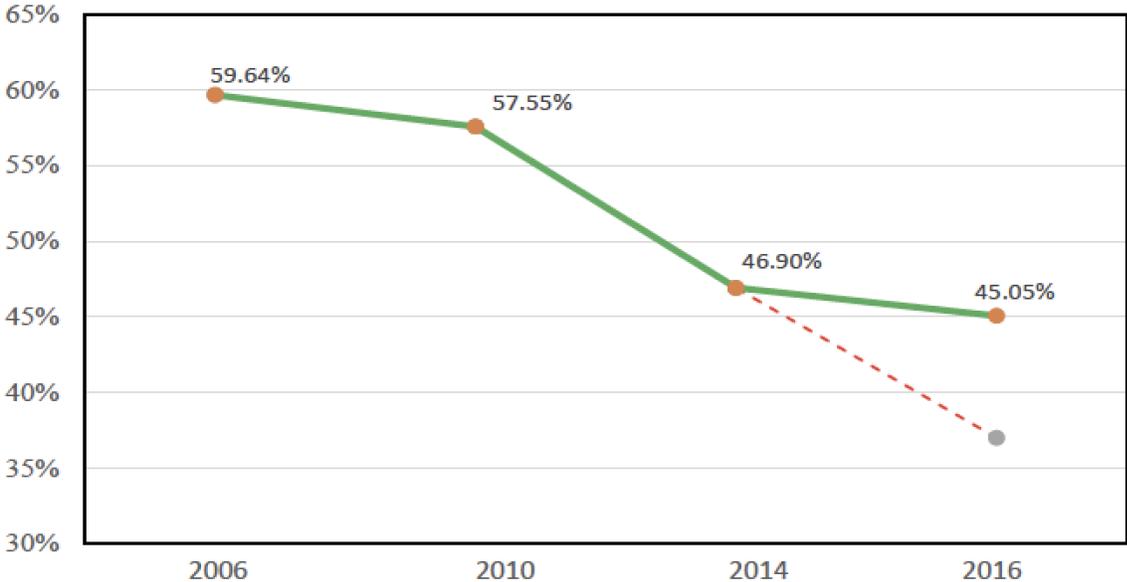
¹³ Ibid

¹⁴ Ibid

¹⁵ Abu SMG KIBRIA and ALISON BEHIE. *Deforestation in Cambodia: the ignored costs in cutting down forests*. Updated September 15, 2017. <https://www.policyforum.net/deforestation-in-cambodia/>

¹⁶ Ibid

Figure Three: Forest Coverage 2006-2016 (Percentage of Total Land).



Source: Cambodian Ministry of Environment

The current assessment of forest cover in 2016 indicates that the forest change rate from 2014 to 2016 has dropped down to an average annual value of 0.93 %. This change can be attributed to effective reform in forest management to prevent forest offenses by a variety of actors: government, local community, the armed forces, and authorities at all levels.¹⁷

The Agriculture v. Forest Protection Tradeoff in Cambodia

Agricultural expansion has been a key factor, as noted above, in the decline of forest coverage. There is a resultant trade-off between agriculture and forestry with regard to their respective abilities to facilitate poverty alleviation and economic development.

Agriculture’s role in poverty reduction derives from two basic circumstances. As less developed countries are generally highly agriculture dependent, many having yet to climb the first rung on the ladder of production - the growth of the agriculture sector is a key mechanism to support economic growth and deliver basic developmental returns to the population. Second, as the poorest households have fewer assets and fewer skills, they naturally rely more on agriculture and generally encounter many obstacles in connecting with the non-agricultural economy for income and employment.¹⁸ Cambodia, for instance, witnessed the poverty headcount fall from

¹⁷ Ibid

¹⁸ Bhajan Grewal, Helena Grunfeld, and Peter Sheehan, “The contribution of agricultural growth to poverty reduction.” ACIAR Impact Assessment Series Report, no. 76 (2012) : 59.

53% in 2004 to 18% in 2012, with four million people moving out of poverty. More than 60% of poverty reduction was a result of positive developments in the agriculture sector.¹⁹

However, agricultural expansion is a root cause of deforestation which has negative developmental impacts on various rural communities. This challenge is compounded by the fact that deforestation and climate change reinforce each other in a vicious cycle: with emissions from deforestation contributing to climate change and climate change compromising the role of forests as a source of resilience to natural disasters that climate models predict as becoming more recurrent and severe over the long term.²⁰

Against this backdrop, Cambodia is still facing limitations in the areas agricultural intensification and forest governance. The core notion of agricultural intensification is that if agricultural yields per hectare can be enhanced, meeting growing global food demand, this will decrease the need for more land devoted to agriculture and hence avoid further encroachment into forested areas (the policy aspects of this issue in the context of Cambodia are discussed in detail below).²¹

In addition, Gritten et al. (2019) have contended that forest governance in Cambodia is currently failing.²² This is attributed to various issues including weak institutional frameworks, issues of stakeholder capacity, and a lack of transparency and accountability. There is also a limited role for civil society organizations and the marginalization of minorities in Cambodia to effectively step in and influence government decisions regarding forest policy.²³ The lack of clearly defined forest governance stakeholder roles is a major issue as regards the development of policy related to the protection of Cambodian forests.

The removal of forest cover exacerbates incidents of flash flooding and worsens the effects of droughts and air pollution in that deforestation is often achieved by slash and burn activities.²⁴ For example, as a result, according to a joint report published in September 2016 by the World Food Programme, UNICEF, and the United Nations Food and Agriculture Organization, 62% of

¹⁹ World Bank. *Cambodian Agriculture In Transition: Opportunities and Risks*. Updated May 19, 2015. <http://documents.worldbank.org/curated/en/805091467993504209/pdf/96308-ESW-KH-White-cover-P145838-PUBLIC-Cambodian-Agriculture-in-Transition.pdf>

²⁰ Frances, Seymour. "Forests and Poverty: Barking Up the Wrong Tree?". Updated May 8, 2017. <https://www.cgdev.org/blog/forests-and-poverty-barking-wrong-tree>

²¹ Ibid

²² Gritten, David et al. "Assessing Forest Governance In The Countries Of The Greater Mekong Subregion." *Forests* 10.1 (2019): 47.

²³ Ibid

²⁴ Beresford, Nick, and Moeko Saito-Jensen. "Why Care About Cambodia'S Forests?." *UNDP in Cambodia*. Updated May 21, 2018. <http://www.kh.undp.org/content/cambodia/en/home/presscenter/articles/2018/03/21/why-care-about-cambodia-s-forests-.html>; FAO. *Agriculture and the environment: changing pressures, solutions and trade-offs*. Accessed 10 July, 2019. <http://www.fao.org/3/y4252e/y4252e14.htm#TopOfPage>

families reported income losses, with an average decline in earnings of 19%, while two-thirds of children under five years of age fell victim to diarrheal illnesses.²⁵

Euan Black contends that agrarian countries in Southeast Asia are now encountering a constant dual-threat of flooding and drought. This is supported by an extensive body of scientific research that demonstrates how rampant deforestation affects climate more profoundly than previously realised. It not only releases carbon dioxide into the atmosphere by cutting down trees (which previously trapped heat) causing global temperature increases, but it also increases incidents of drought and flash flooding.²⁶ This contributes to global warming by releasing massive amounts of CO₂. Data from Global Forest Watch Climate indicate that Cambodia's 1.59 million hectares of tree cover loss over a 14-year period resulted in around 533 million metric tons of carbon emissions.²⁷

The impacts of climate change on Cambodia's long term development are likely to be severe. According to UNDP, "Cambodia is consistently ranked among the top ten countries most vulnerable to climate change, and among the three most vulnerable in Asia."²⁸ The trade-off between agriculture and forest protection is further complicated by both internal mismanagement and an externally driven cycle of climate disruption.

Present Government Strategy: Agriculture and Forestry

The Cambodian government's current 2030 vision proposes that agriculture will have been transformed by that time to make the country more competitive in the global market as well as to ensure food security, safety, and nutrition for Cambodians' own wellbeing.²⁹ The policies to support the development of the *Master Plan for Crop Production in Cambodia* can be categorized into two frameworks: (i) policies related to each specific value chain targeted; and (ii) policies that are cross-cutting and crucial for all corps in general, not specific to one crop in particular.

The promotion of agriculture productivity and diversification via intensification rather than through expansion of cultivated land is a key point of the *Master Plan for Crop Production in Cambodia*. However, this document also acknowledged that land expansion in agricultural

²⁵ Ibid

²⁶ Ibid

²⁷ Morgan Erickson-Davis. *NASA releases images of dramatic deforestation in Cambodia*. Updated January 13, 2017. <https://news.mongabay.com/2017/01/nasa-releases-images-of-dramatic-cambodia-deforestation/>

²⁸ UNDP Cambodia. "Cambodia Climate Change Alliance". *UNDP In Cambodia*, http://www.kh.undp.org/content/cambodia/en/home/operations/projects/environment_and_energy/cambodia-climate-change-alliance.html.

²⁹ Sok, Chan. "Framing to be transformed by 2030." *The Khmer Times*, April 20, 2018. <https://www.khmertimeskh.com/50303212/farming-to-be-transformed-by-2030/>

sectors, particularly cassava, is unsustainable in that it has been carried out through forest clearing and soil exploitation. While agricultural intensification is a positive development, it is not necessarily a panacea to resolve the agriculture/forestry trade-off. Lam, Pham, and Nguyen-Viet (2018) identified risks associated with agricultural intensification. For instance, the extensive use of chemical fertilizers and pesticides for crop production can increase occupational exposure of farmers to chemical and pesticide residues, while also putting pressure on local ecosystems through surplus residues and toxins in the groundwater and surface water.³⁰ Noting these concerns, agricultural intensification is not necessarily ideal as regards promoting sustainable agricultural management and resolving the challenge of increased land usage for agriculture.

On forestry policy, the Royal Government of Cambodia contends that the *Production Forest Strategic Plan 2018-2032* (PFSP) will steer future development and sustainable management of production forests with a focus around their contribution to poverty alleviation and economic growth.³¹ The PFSP is the first comprehensive, strategic document for production forests in Cambodia that responds to the need to adjust to the recent institutional reform in the forestry sector and supports changes in the forest governance framework in a context of rapid socio-economic transformation and emerging vulnerabilities of natural resources.³² However, this is not necessarily consistent with agricultural policy and the continued growth of agricultural production as previously discussed.

The Master Plan for Crop Production in Cambodia demonstrates a strong link between global commodity markets and forest loss given the fact that regional and global demand for agricultural goods will foster increased deforestation. Grogan et al. 2018 found that the expansion of rubber tree plantations has been a major driver of deforestation in Cambodia.³³ All of this necessitates greater attention to the continuing challenges of agricultural land demand and sustainable forests.

Conclusions and Policy Recommendations

There is significant interplay between agriculture and forestry as both contribute to poverty reduction strategies in Cambodia. Cambodia's agriculture and forests are under mounting

³⁰ Lam, Steven, Giang Pham, and Hung Nguyen-Viet. "Emerging Health Risks From Agricultural Intensification In Southeast Asia: A Systematic Review." *International Journal of Occupational and Environmental Health* 23.3 (2018): 250-260.

³¹ UNDP Cambodia. *Production Forest Strategic Plan: A guiding partway toward ensuring economic development and sustainable forest management*. Updated August 30, 2018. <http://www.kh.undp.org/content/cambodia/en/home/presscenter/pressreleases/2018/production-forest-strategic-plan--a-guiding-partway-toward-ensur.html>

³² Ibid

³³ Grogan, Kenneth et al. "Unravelling The Link Between Global Rubber Price And Tropical Deforestation In Cambodia." *Nature Plants* 5.1 (2018): 47-53.

pressure from strategic mismanagement, compounded by the pressures of climate change, deficiencies in agricultural intensification, and weak forest governance. This is resultantly impacting the livelihoods of the Cambodian people.

Accordingly, there is a need for Cambodia to determine, develop, and implement a sustainable model for its forestry and agricultural sectors, principled around an equitable development pathway. Four measures should be promoted towards this end:

1. The Ministry of Agriculture Forestry and Fisheries should initiate a 20-year forest rehabilitation effort, focused on sustainable tree-planting efforts across 1 million hectares of cleared forest land. The reforestation project will contribute to the reduction of greenhouse emissions and climate change mitigation and will increase the forest cover in Cambodia. There will need to be extensive efforts made to address issues of budget and logistics. As discussed above sustainable tree planting efforts forests are natural solutions in mitigating climate change due to their carbon sequestering and storage capabilities as one tree can store an average of about 48 pounds of carbon dioxide in one year.
2. Improve forest governance and provide greater transparency through increasing stakeholder participation - especially women, indigenous peoples, rural civil society organizations, and other marginalized groups - in decision making and benefit sharing.
3. Development of a central knowledge exchange system to collect and transparently catalogue available data on Cambodia's forests. Such a system would include data such as forest coverage, biodiversity, and agroforestry trade volume. By so doing, policy makers will be better able to analyze and interpret data in order to make better informed, data-driven decisions in order to better develop the National Forest Program concerning land-use change from forests to agriculture. In addition, Cambodia will be able to submit comprehensive data to the FAO with a view towards contributing to the need for more comprehensive and publicly available data sets supporting future research on forest protection in the Asia-Pacific.
4. The completion of a full study and the convening of a working party within the relevant government ministries to ensure collaboration and coordination with an eye towards developing sustainable policies for both the agricultural sector as well as the protection of Cambodia's forests recognizing the inherent conflicts between the two.