



UNDER WHICH CONDITIONS DOES ALTERNATIVE DEVELOPMENT CREATE SUSTAINABLE INCOME AND LIVELIHOODS FOR FARMERS?



UNODC

United Nations Office on Drugs and Crime



EXECUTIVE SUMMARY AND KEY FINDINGS

Alternative development (AD) is part of a comprehensive drug-control strategy. Along with eradication and interdiction, which collectively seek to reduce the supply of controlled drugs and their inputs, alternative development has been a key component of drug-supply control strategies for decades. Alternative development aims to address poverty and the lack of livelihood opportunities in rural communities, which are recognized among the root causes of illicit cultivation of plant-based inputs to heroin and cocaine.

Measuring success of AD projects goes beyond measuring reductions in area of illicit cultivation. A comprehensive analysis of the impact of AD projects on the socio-economic situation of those affected can yield insights on progress made towards a sustainable reduction on the reliance of households on illicit cultivation of crops. Changes in income and income structure among beneficiaries of projects can be an indicator for sustainable, legitimate income opportunities and overall household wellbeing.

DATA AND METHODOLOGY

This report uses data from beneficiaries of four distinct large-scale alternative development projects implemented by UNODC in Afghanistan and Colombia since 2010 (annual budget of US\$ 1 to 30 million each). It compares 5,240 beneficiaries and 1,870 non-beneficiary households in Afghanistan from 2019 and analyses panel data collected from 216 randomly selected beneficiaries in Colombia over three different periods: baseline, mid-term, and follow-up. The methodology comprises both machine learning models (AdaBoost regressions) and qualitative techniques.

OVERVIEW OF ALTERNATIVE DEVELOPMENT PROJECTS

Forest ranger project, Colombia	PNIS, Colombia (Programa Nacional Integral de Sustitución de Cultivos Ilícitos)	Land Property Title project, Colombia	BADILL, Afghanistan (Boost Alternative Development Interventions Through Licit Livelihoods)
Implemented over a longer period in different municipalities. Average intervention duration 3 years.	Started in 2017 with implementation breaks. Average intervention duration 3 years.	2017-2021 Average intervention duration linked to process to obtain land titles.	Three-year implementation period (2019-2021)
Baseline 2010, Endline 2012, Follow-up 2021	Baseline 2017, mid-term 2019-2021; project is on-going	Baseline 2017, Endline 2018, Follow-up 2021	Baseline 2019, follow up was not possible
<ul style="list-style-type: none"> initial cash transfer food security projects productive projects, including market access "comprehensive accompaniment" (implementation of a plan of concerted actions with the communities to individually support them by providing tailored economic, productive, social, and environmental assistance) trainings and technical assistance 	<ul style="list-style-type: none"> initial cash transfer food security projects quick income-generation projects (partially implemented by 2021) long-term productive projects (still not implemented by 2021) trainings and technical assistance 	<ul style="list-style-type: none"> assistance to households to obtain land titles to strengthen the national policy of formalization and access to land in areas vulnerable to illicit-drug crop cultivation 	<ul style="list-style-type: none"> Large-scale alternative development projects: support to agricultural value chains (grapes, almond, pistachio, apple and oil seed crops) support to land / sand stabilization Small-scale alternative development projects: support to animal husbandry (dairy and backyard poultry farming) greenhouses establishment (off season vegetables production) marketing and agricultural extension support vocational and skill development establishment / strengthening the

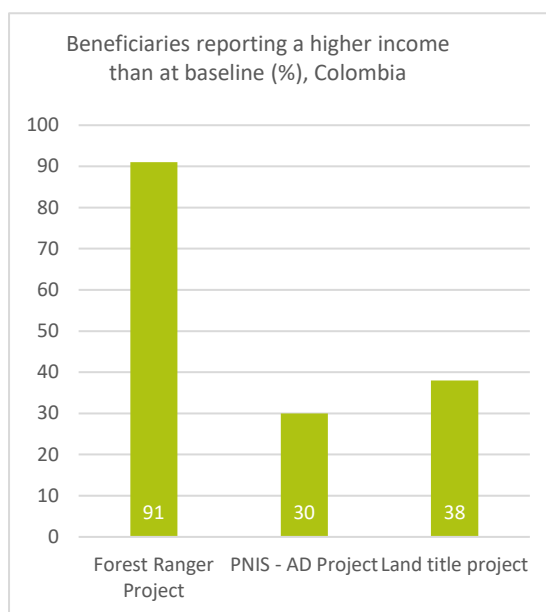
KEY TAKEAWAYS

A sustained, comprehensive alternative development project can make a noticeable difference: The project with the highest income ratings was the one with a full package of high quality well-supported interventions.

The 'Forest Ranger' project offered a full package of interventions, comprising an initial cash transfer, food security projects, and productive projects, including market access initiatives, and "comprehensive accompaniment", a community plan to provide tailored economic, productive, social, and environmental assistance and trainings.

The project was perceived very well by the beneficiaries: when asked about their perception of change in income, nine out of ten of the beneficiaries of the Forest Ranger project indicated that their income had increased in 2021 in comparison to the baseline (before the projects started), while only three out of ten of the PNIS and around four out of ten of the Land Property Titles projects indicated the same. The Forest Ranger project was the best rated on increasing agricultural production and enhancing the technical capacity of participants and market access, too.^{1,2}

On the other hand, according to the beneficiaries, the PNIS project (still ongoing) did not deliver critical project components on time. This was reflected in their assessments: the overall experience of the participants was "neutral", while the other two projects had a positive evaluation.

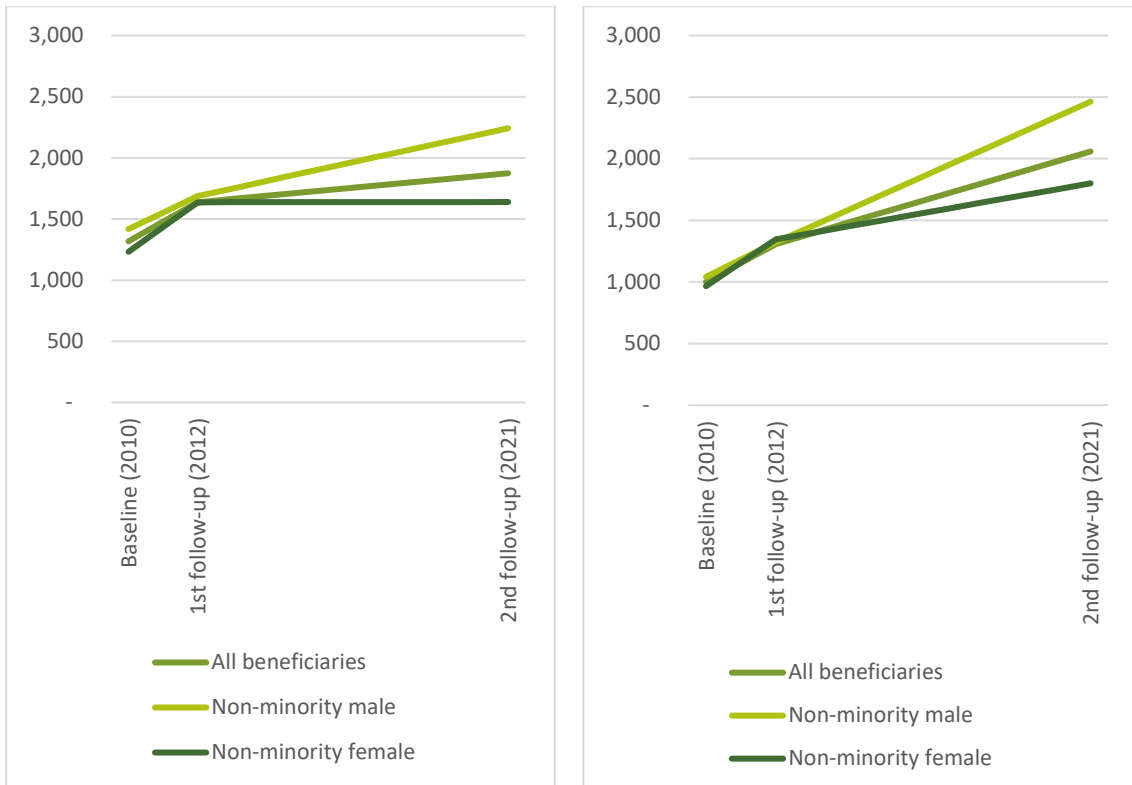


¹ The Forest Ranger and PNIS project both sought to strengthen the productivity of the beneficiary families through economic incentives and an investment package. In the case of the Forest Ranger project, the data collection for the income change analysis was done after the project was completed and the beneficiary families had received the entire investment. For the PNIS project, which is still ongoing, the analysis of income changes is mid-term, and the situation may be different at the end of the project. This must be considered when comparing perceived and measured income changes between these projects.

² The Land Property Titles project was not focussed on increasing productivity and did not include a similar investment package like the Forest Ranger and PNIS project. Therefore, change in income may be associated with the delivery of the property title directly or indirectly, or with conditions external to the implementation of the project. The results of the qualitative interviews help to explain these interactions.

“The project taught us how to sustain the vegetable gardens for food security, and we participated in farmers’ markets for the commercialization of the surplus of our harvest. It was definitely a very good project.” (Luz, 36, Forest Ranger project)

Trend in annual household income (US dollars) per subgroup (Baseline, first follow-up, and last follow-up in 2021)³, Forest Ranger Project, real and nominal income.



Real income (adjusted for inflation, with base year 2018).

Nominal income without inflation adjustment.

The above quantitative assessment shows that overall income increased for the beneficiaries of the Forest Ranger project, even when adjusted for inflation. However, it can also be observed that after an initial similar increase for all beneficiaries, in the longer term, the income gap between men and women increased. The reason for this trend is unclear and may or may not be related to the project interventions. A possible explanation could be that male headed households benefitted more due to the type of interventions which may have focussed more on commercial agricultural production, while interventions for female headed households focussed more on food security.

³ For income change and comparison of income among projects, all income corresponds to real income (at constant prices using as base year 2018). The exchange rate from Colombian pesos to USD corresponds to the year in which the income was earned.

In both Afghanistan and Colombia alternative development projects offered women economic and technical assistance, resulting in additional income for their households that otherwise would have been out of reach.

Traditionally, rural income is strongly associated with ethnicity and gender: men earn higher incomes than women, and non-minorities earn more than minorities. The farmers interviewed in Colombia showed large differences in self-reported annual household income based on gender and ethnic group. During the baselines, non-minority male-headed households self-reported earning the highest annual household income (US\$ 2,530), closely followed by Afro-Colombian men (US\$ 2,500) and indigenous men (US\$ 2,420). Non-minority women earned the highest annual household income (US\$ 1,815), followed by indigenous women (US\$ 1,640), and Afro-Colombian women (US\$ 1,310). In Afghanistan, female-headed households in the project made 30 per cent less (US\$ 1,100) than male-headed households (US\$ 1,515).

The alternative development projects offered women economic and technical assistance so they could earn additional income for their households that otherwise would have been out of reach. This contributed to specifically increase women's income. In Colombia, female-headed households across all groups had an increase in income during at least one period of time (mid-term survey compared to the baseline, or mid-term to last follow up), whereas male-headed households across groups experienced a slight decrease in annual income during the mid-term survey compared to the baseline, and also in the last follow-up compared to the mid-term (this period was partially during the COVID-19 pandemic).

"My household income increased with the assistance of the project. I was an (ex) housewife and did not receive any income of my own. After the project, we improved our economic resources." (Blanca, 77, Forest Ranger Project – Antioquia)

"Before the project, we only received some income from my ex-husband's day labour and a little from agriculture (coca). After my participation in the project, my life changed with the economic incentive, and then, with the production of cocoa. The project has helped us a lot." (Irma, 41, Forest Ranger Project)

"The land was under my father's name, but he passed away. The project took good care of us. The land was divided between five siblings and my father's partner. Without the project I would have not registered our property because I did not know how and did not have the resources to do it." (Argenida, 40, Land Property Titles Project)

The AD project in Afghanistan was specifically inclusive for female-headed households by promoting sales of dairy and poultry. As women are generally not allowed to work outside of their own farm, they are usually responsible for animal husbandry, especially the raising of small livestock. Milking livestock is also typically a woman's job in Afghanistan and the profits from milk sales tend to go directly to them. The project was able to reach a very high proportion of women: 38 percent of beneficiary households were female headed, whereas among the general population only some 1.7 percent of households were female-headed. This contributed to strengthening women's income among the beneficiaries.

Alternative development interventions can aid in reducing income inequality by reaching the poorest and most vulnerable households

Income inequality is prevalent inside rural areas, as land distribution and other productive resources are unequally distributed among households. Data from beneficiary and non-beneficiary households from the alternative development project in rural Afghanistan showed that the income inequality (as measured by the GINI coefficient) in the communities was reflective of some of the most unequal countries in the world.

Participation in alternative development projects is voluntary and different designs may attract participants from different segment of the population. For example, orchards, a common intervention in Afghanistan, require a minimum area of land available and may therefore attract the better-off, whereas poultry or dairy can be produced with little land, which may be more attractive to poor and small landholders.

Annual household income (USD) BADILL/Afghanistan, 2019



The Alternative Livelihood project studied in Afghanistan demonstrated successfully that promoting non-crop interventions such as dairy and poultry sales, reached poorer segments of the rural population. The annual household income of all beneficiary households was about 10 percent less than the annual household income of comparable non-beneficiary households, suggesting that such interventions attracted lower income segments. Further, the project attracted female-headed households in greater proportions.

In addition, poppy-cultivating households that earn less income from legal crops, dairy, or livestock wages than non-beneficiaries also participated at higher rates. These households may have land availability constraints, and therefore non-crop interventions may be particularly suitable for them. The data showed that the type of interventions offered attracted the poorest households in Afghanistan and that targeting women can increase income when little land is available.

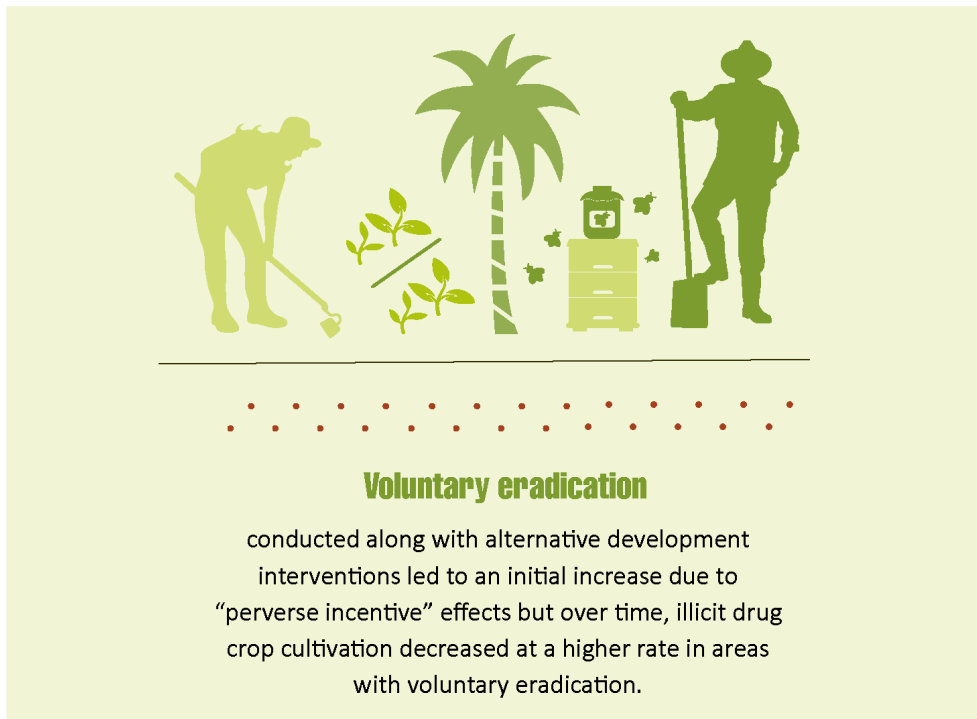
Voluntary eradication is likely to have a stronger and longer-lasting effect on reducing illicit coca cultivation

Most of the beneficiaries perceived that area under coca cultivation in their communities decreased or remained the same over time. On average, for all the Colombian projects, nine out of ten beneficiaries assessed that coca cultivation in their communities decreased or remained the same in 2021 when compared to the baseline.

Initial voluntary eradication of coca by the beneficiaries was most associated with the perception of changes in coca cultivation, while income changes were not. This indicates that voluntary eradication may have a lasting impact on area under coca cultivation, which is in line with findings from other research that found that voluntary eradication conducted along with alternative development interventions led to stronger decreases in illicit drug crop cultivation than forced eradication (however, there have been reports of increases of illicit cultivation in areas with voluntary eradication as participants may have been incentivized by initial promises of cash transfers based on area under cultivation).

Non-delivery of projects may threaten this progress: beneficiaries of a delayed project voiced concerns that some people do not want to continue in the project and plan to restart cultivating coca in the (near) future, as they have lost trust that the project will deliver its productive component.

“People no longer want to continue in the project. At first, it was perceived as positive, but today it is difficult to continue due to the non-compliance from the project side. People in our community do not want to continue with the project. (Ruben, 46, PNIS-Putumayo, Afro-Colombian, ex-coca farmer)”



Beneficiaries valued alternative development projects that addressed long-term needs and involved the whole community

The beneficiaries of the Colombian AD projects considered future needs more than present needs when asked about their expectations from the projects and valued the influence on the community strongly. This implies that highlighting not only the short-term but also the long-term benefits of an AD project may help to convince households to participate and remain as beneficiaries of the projects.

“People who participate in the project and eradicated their coca did it thinking of a better future for their families. Only 5% did not eradicate their coca” (Dayner, 27, PNIS)

“I liked the project. It helped us. There was a vision for the future. I liked the integration among people, and the sharing with the people, and the interpersonal relationships that we made with the neighbours.” (Ignacio, 80, Forest Ranger project)

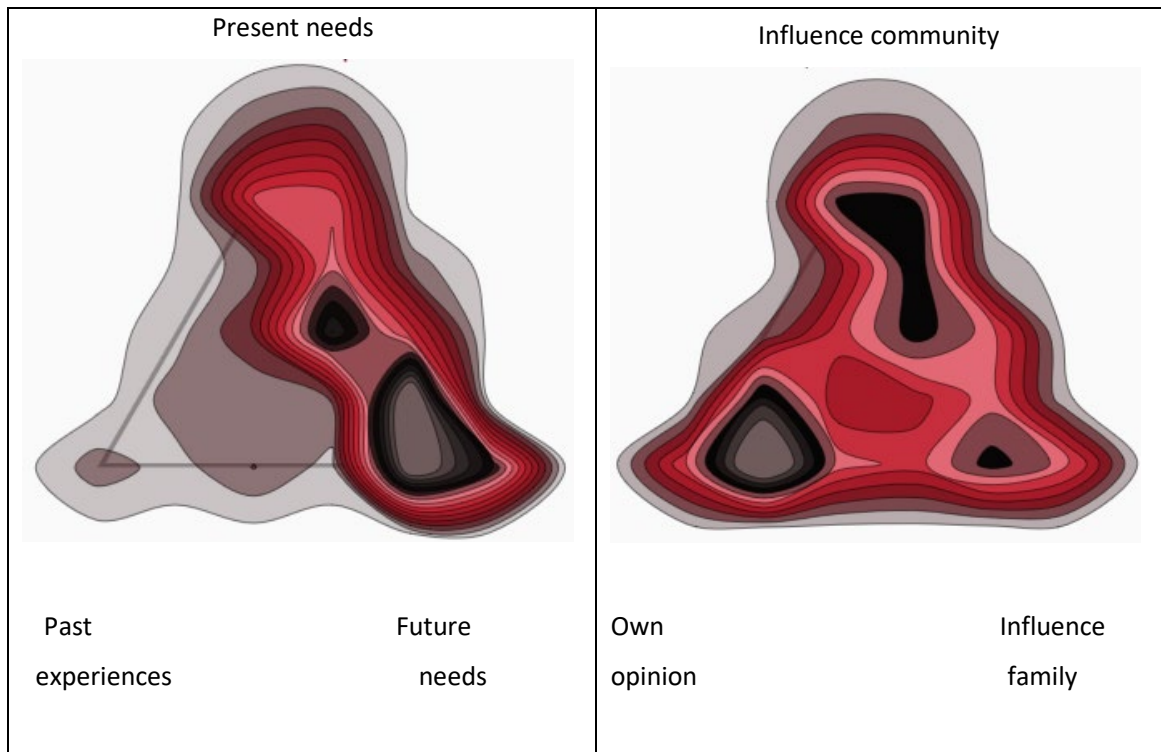
The importance of a long-term perspective was also mentioned in context with non-income related outcomes. Almost 9 out of 10 beneficiaries of the Land Property Title project associated their overall experience with the project with a positive feeling, including trust in authorities. In comparison to the beneficiaries of the other two projects, the beneficiaries indicated that the positive feeling was due to the assurance of having proof of land ownership and not in perceived income changes.

The beneficiaries placed a high weight on the influence of the community on the successful participation in the AD projects. A strong, positive community (for example active community decision making) was associated with a higher income earned by beneficiaries, and the evidence collected indicated in turn a positive impact of the projects themselves on the communities.

“The coca crops in my village were completely eradicated. I participated in the committee that monitored the uprooting of coca bushes. Each landowner uprooted their coca plants. With the eradication of illicit crops, there was a positive change because the illegal groups no longer intervened here” (Villalba, 45, Forest Ranger)

“With the coca eradication, the social situation (community progress and common responsibility) improved a lot. I feel peaceful and my family and I dare to say that the whole village is feeling peaceful. It is very good to live in peace and tranquillity” (Dioselina, 75, PNIS)

“My satisfaction with the project is high because the land is now mine and I have the legal document that certifies me as the owner. This project gave me, my mother and my children peace of mind” (Claudia, 41, Land Property Title Project)



Respondents were asked to place a dot inside the triangle. The closer the dot to the vertex of triangle, the more importance is placed to the characteristic in that vertex for the respondent. The darker the colour in the heatmaps, the larger the number of respondents that placed a dot in that area of the triangle (black and grey are the darkest, followed by red and pink tonalities).

COVID-19 had a negative impact on the income of Colombian farmers, but AD projects may have mitigated some losses

Data on income was collected at the baseline (2012 for the Forest Ranger Project, 2019 for the other two) and in 2021 at a follow up. Between 2019 and 2021, the income reported by beneficiaries decreased across subgroups. This was mainly attributed to the impact of the COVID-19 pandemic, as illustrated by the farmers:

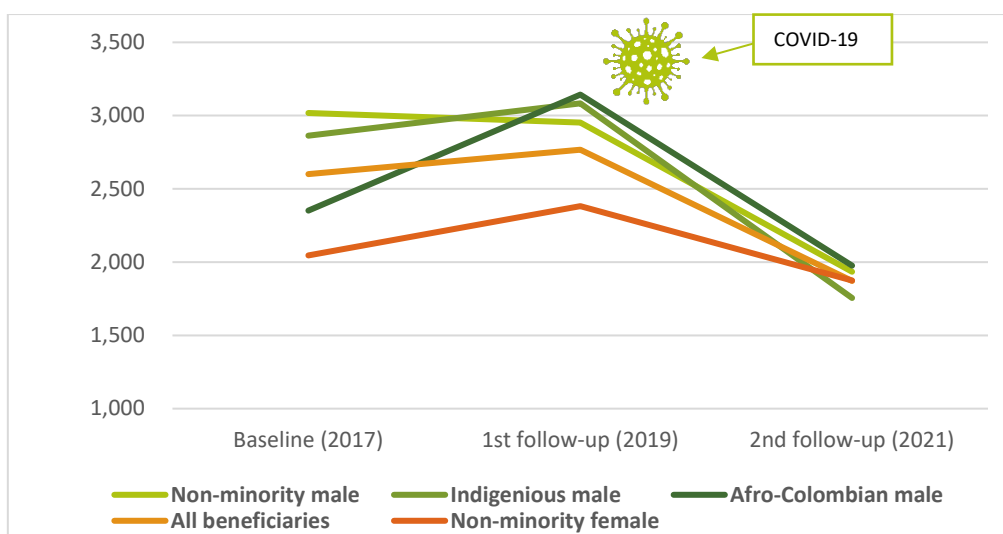
“There is no employment, so here it is difficult. One works one day, one or two and no more. Nothing. The Land Property Titles Project has nothing to do with that. Only right now there is no work.” (Gabriel, 65, Land Property Titles Project)

“There are not resources to work. People left the village. People no longer pass through this (river) area to transport them on the boat. All because of the pandemic.” (Nataniel, 56, PNIS)

The data showed, however, that the impact was different across projects. Income increased for beneficiaries of the Forest Ranger project. When disaggregated by sex, the results suggest a small decrease in income for women in the Forest Ranger project from mid-term to follow-up, however the income change from baseline to follow-up was positive, suggesting an overall net positive effect. The Land Property Title project was linked to maintaining annual household income over time even if COVID-19 reduced earnings in the interim. The PNIS, which in comparison to the previous two projects is still on-going, has been associated with decreases in annual household income so far. However, PNIS beneficiaries reported increases in income from baseline to mid-term (prior to COVID-19), further supporting that the decreases were mostly due to the global pandemic.

While the data does not allow for final conclusions on the reasons between the differences in income changes, a possible explanation is that the Forest Ranger and Land Title projects, due to their longer duration and overall successful implementation, served to protect beneficiaries during the pandemic.

Trend in annual household income (US dollars) per subgroup (Baseline, first follow-up, and last follow-up in 2021), PNIS AD project, real and nominal income.



Adjusted for inflation.

Targeted monitoring can provide better evidence for designing Alternative Development Projects

Alternative development projects may differ in location, beneficiaries, and design but have ultimately the same goal: to improve the livelihoods of their beneficiaries in a sustainable manner and to increase their resilience against illicit crop cultivation.

The projects investigated here showed an impact at different metrics: The provision of land titles, for example, provided security of ownership to the beneficiaries and increased their trust into authorities, while not necessarily strongly affecting perceived increasing changes. An initial cash transfer, on the other hand, provided short term income, but was perceived by some as intervention without lasting effect.

The results show that AD projects can improve livelihoods in many ways. Illicit crop cultivation has multi-faceted drivers, and alternative development projects may address each driver differently and by different means. Using a single metric to evaluate effectiveness, such as area under illicit crop cultivation, can blur the view on essential metrics. A comprehensive and targeted data collection and monitoring of the alternative development projects, with suitable and well-crafted indicators for success, can provide Member States and the international community with better evidence on the effectiveness of alternative development projects.

INTRODUCTION

Alternative development is part of a comprehensive drug-control strategy. Along with eradication and interdiction, alternative development has been a key component of illicit-drug supply control strategies for decades. Alternative development aims to address the root causes of poverty and the lack of livelihood opportunities in rural communities engaged in illicit crop cultivation. The evaluation of the success of alternative development projects mostly has been assessed changes in illicit crop cultivation.⁴ So far, this approach has prevented a deep understanding of the poverty and income changes of beneficiaries located in affected communities and their progress towards a gradual but sustainable reduction of illicit crop cultivation.⁵ Systematic socio-economic data collection has proven to be challenging due to conflict and security problems in many areas where cultivation of coca and poppy occur. However, a better availability of analyses of income changes before and after the implementation of alternative development projects can provide Member States and the international community in general with greater evidence on the effectiveness of alternative development at increasing the resilience of rural communities and households against illicit crop cultivation.

Alternative development projects are not uniform and differ not only in their location (countries and regions) but also in their design. A UNODC report found that 53 alternative development projects implemented in Afghanistan, Colombia, Peru, Bolivia, and Myanmar (2013-2017) had very different designs with around half focusing on the introduction of high value crops; a quarter on farmer associations; one-fifth on food security; and the rest on others⁶.

This report evaluates the experiences from Colombia and Afghanistan. From Colombia, it involves measures from 216 representative beneficiaries⁷ of three alternative development projects in Antioquia and Putumayo over three different time periods: baseline (2017), mid-term (2019), and follow-up (2021)⁸. The projects are “*Programa de Familias Guardabosques*” (Forest Ranger project), “*Formalizar para Sustituir*” (Land Property Titles project), and “*Programa Nacional Integral de Sustitucion de Cultivos Illicitos*” (PNIS)⁹. In addition, data are analysed from one alternative development project (BADILL, 2017-2021) in Afghanistan involving 5,240 beneficiary and 1,871 non-beneficiary households located in 91 targeted communities in 11 provinces.¹⁰ Afghan data was collected during the baseline in 2019, meaning the data was collected before the project started. The main type of interventions implemented by the project was the promotion of dairy products and poultry-related sales¹¹, which was selected for its high potential to reach women as beneficiaries. In rural Afghanistan, women are generally not allowed to work outside of their own farm, therefore women are usually responsible for animal husbandry, especially the raising of small livestock. For instance, women

⁴ UNODC 2015, World Drug Report 2015.

⁵ Ibid.

⁶ UNODC. 2019. “Global overview of alternative development projects, 2013-2017”

⁷ The sample of 216 beneficiaries was obtained from 1,225 beneficiaries for which UNODC had panel data.

⁸ The follow-up was conducted in 2021 for the three projects. For PNIS, the baseline was in 2017 and the mid-term in 2019 (as shown in the text of the report). For the Land Property Rights project, the baseline was in 2017 and the mid-term in 2018. For the Forest Ranger project, the baseline was in 2010 and the mid-term in 2012. For income change and comparison among projects, all income corresponds to real income (at constant prices using the base year as 2018). The exchange rate from Colombian pesos to USD corresponds to the year in which the income was earned.

⁹ See Table 1 for the general description of the three alternative development projects.

¹⁰ The alternative development project was partially replacing the Good Performance Initiative (GPI), which focused on providing development assistance to those provinces that have eliminated or significantly reduced opium poppy cultivation in Afghanistan. The targeted provinces for which data was collected in 2019 and that were included in this analysis are: Bamyan, Hilmand, Jawzjan, Nangarhar, Paktika, Paktya, Panjshir, Parwan, Samangan, Takhar, and Wardak.

¹¹ Other interventions of the project which were conducted with a fewer number of both male- and female-headed beneficiary households included: kitchen gardens; grape T-Trellis systems and vineyard management; vegetable low and high tunnels; handicrafts; greenhouses; fruit orchards; wheat, peas and potato seed distribution; literacy courses; watershed management; enhancement of silvi-pastoral system; and improvements of oil crops value chains. Interventions were mutually exclusive. One intervention per household.

produce more than 90 percent of the poultry meat and eggs in rural communities¹². Milking livestock is also typically a woman's job in Afghanistan and the profits from milk sales tend to go directly to them.¹³

Alternative Development projects differ strongly in duration and design, requiring targeted monitoring and evaluation

Alternative development projects are not uniform and differ in location, beneficiaries, and design. While all projects had ultimately the same goal, namely improving the livelihoods of their beneficiaries in a sustainable manner to increase their resilience against illicit crop cultivation, they differed strongly in their duration, means and design. The 'Forest Ranger' project was implemented over a longer period in different municipalities with an average duration of the interventions of three years. It provided many interventions, ranging from initial cash transfers to food security interventions, and community-based interventions. The follow-up assessment of impact on income was implemented 5-10 later. The PNIS project started in 2017, but due to several reasons it only had fully implemented the initial cash transfers in 2021; other interventions aiming at increasing productivity, were still pending. The PNIS project is still ongoing. The 'land title' project (2017-2021) provided first and foremost assistance to households to obtain land titles to strengthen the national policy of formalization and access to land in crop cultivation areas, while the Afghanistan project (2019 – on-going) focused on agricultural value chains, and providing alternative, agricultural sources of income to participating households.

Some of these interventions can lead to a measurable impact on income only years after their implementation but are no less important than interventions that have a short-term impact: The provision of land titles, for example, provided security of ownership to the beneficiaries and increased their trust into authorities, while not necessarily strongly affecting perceived increasing changes. An initial cash transfer, on the other hand, provided short-term income, but was perceived by some as intervention without lasting effect.

Applying the very same metrics to vastly different projects can hinder a fair evaluation. Illicit crop cultivation has multi-faceted drivers, and alternative development projects may address each driver differently and by different means. A comprehensive and targeted data collection and monitoring of the alternative development projects, with suitable and well-crafted indicators for success, can provide Member States and the international community with better evidence on the effectiveness of alternative development projects.

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¹² FAO. No year. "Poultry projects enhance lives of Afghan women"

¹³ FAO. 2015. "Empowering women in Afghanistan. Reducing gender gaps through Integrated Dairy Schemes."

FINDINGS FROM THE ALTERNATIVE DEVELOPMENT PROJECTS IN COLOMBIA¹⁴

Income changes over time by project

Alternative development projects differ in their design. The Forest Ranger project offered a package of benefits (consisting mainly of a combination of an initial cash transfer, food security projects, and productive projects, including market access initiatives) and "comprehensive accompaniment", which corresponded to the implementation of a community plan to provide tailored economic, productive, social, and environmental assistance and trainings¹⁵. The PNIS mainly consists of an initial cash transfer, food security projects, quick income-generation projects, and (long-term) productive projects, along with technical assistance.¹⁶ In contrast, the Land Property Titles project sought to strengthen the national policy of formalization and access to land in areas vulnerable to illicit cultivation. In this way, vulnerable families could dedicate themselves to licit economies under a culture of legality.¹⁷ As a prerequisite for participation in any of the projects, all beneficiaries needed to eradicate their coca plots. The eradication was verified by UNODC-Colombia through in-situ inspections.

Changes in the self-reported annual household income during the baseline in comparison to the self-reported annual household income during the follow-up (2021) were associated with the type of project and implementation status. The Forest Ranger project was linked to increases in income for all beneficiaries. Figure one below shows that despite a general increase of income of all groups, the income gap between male and female-headed households increased. When disaggregated by sex, the results suggest a small decrease in income in the Forest Ranger project from mid-term to follow-up for female-headed households, however the income change from baseline to follow-up was positive for all beneficiaries. The Land Property Title project was linked to maintaining annual household income over time, although this varies greatly depending on the beneficiary. For example, Indigenous females experienced an increase in income, while Afro-Colombian males and non-minority males experienced decreases in income. Although it should be noted that the sample size of each subgroup within the Land Property Title project is small, and so these differences may not be statistically significant. The PNIS, which in comparison to the previous two projects is still on-going, has been associated with decreases in annual household income so far. However, PNIS was associated with increases in income from the baseline to the mid-term (prior to COVID-19), further supporting the claims that the decreases in income was due to the pandemic.

All income data needs to be read in context of the COVID-19 pandemic that led to major economic disruption in the country.

¹⁴ The results and main findings of this chapter are disaggregated by ethnic group and gender. The dataset (a panel of 216 households) is not large enough to disaggregate it by both ethnic group/gender and coca cultivation status at the baseline (as creates several groups with only 1-2 households per group). None of the farmers indicated cultivating coca during the follow-up (2021). The comparisons of this ethnic groups and gender with the various alternative development projects provided more insights than when comparing groupings by coca cultivation status.

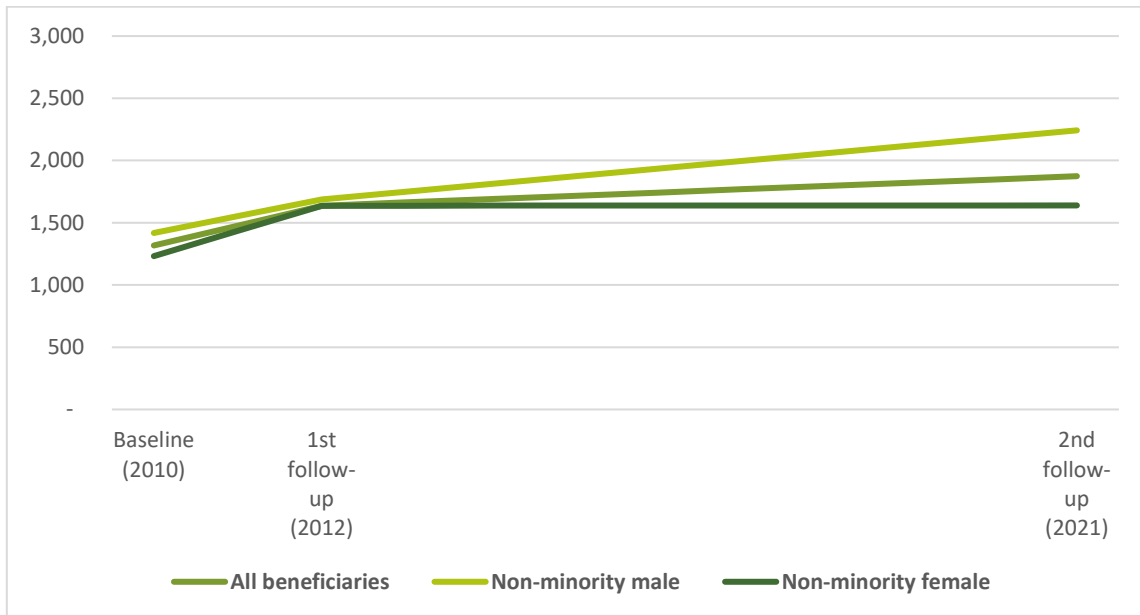
The results use a mixed methodology consisting of a combination of quantitative analysis (descriptive statistics, parametric and non-parametric correlations, and machine learning regressions) and qualitative analysis (using responses from an open-ended questionnaire implemented using the SenseMaker[®] software) to better understand changes in income before and after the implementation of the alternative development projects.

¹⁵ Government of Colombia. 2015. "Manual Técnico Operativo Modelo de Posterradicación y Contención – Familias Guardabosques Para La Prosperidad"

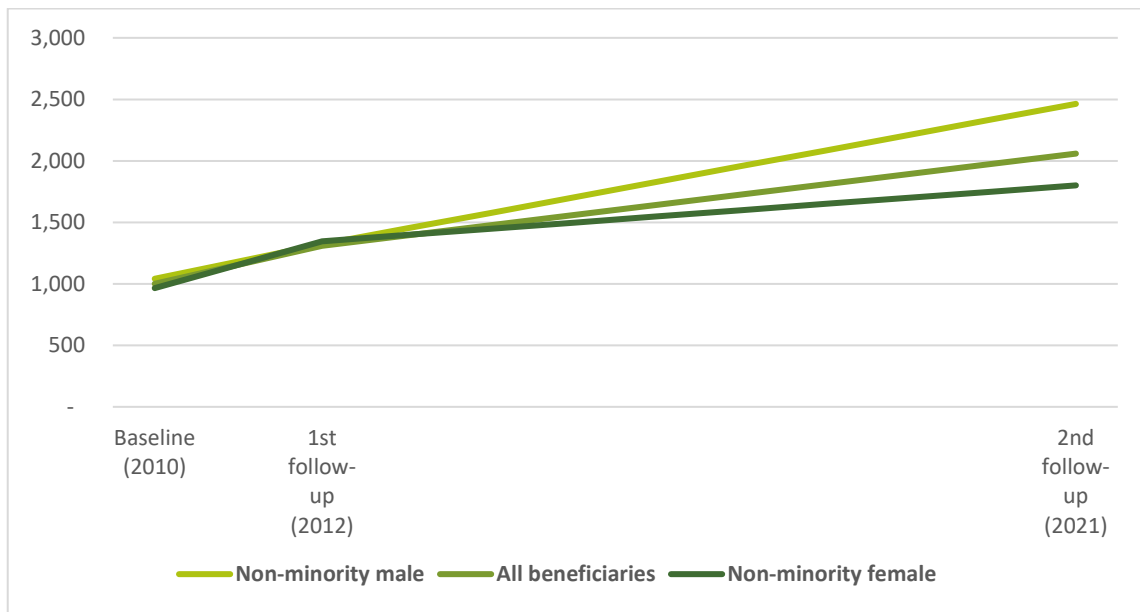
¹⁶ UNODC, 2021. Informe 23. Programa Nacional Integral de Sustitucion de Cultivos.

¹⁷ Colombian National Land Agency and UNODC. 2017. "Formalizar para Sustituir. Informe de Línea Base".

Figure 1: Trend in annual household income (US dollars) per subgroup (Baseline, first follow-up, and last follow-up in 2021)¹⁸, Forest Ranger Project, real and nominal income.



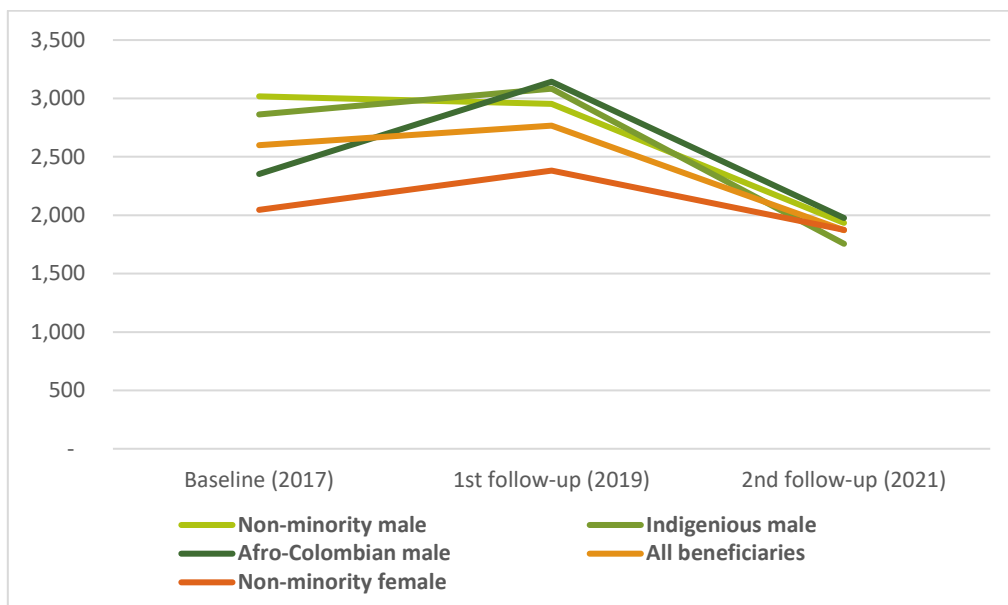
Real income (adjusted for inflation, constant prices using as base year 2018). Total number of observations = 36 (from the following subgroups: Non-minority: Male=19, Non-minority: Female=16). The group “Indigenous Female” was not included in the analysis due to few observations (=1). Other groups were not in the sample (Indigenous Male, Afro-Colombian Male, and Afro-Colombian Female).



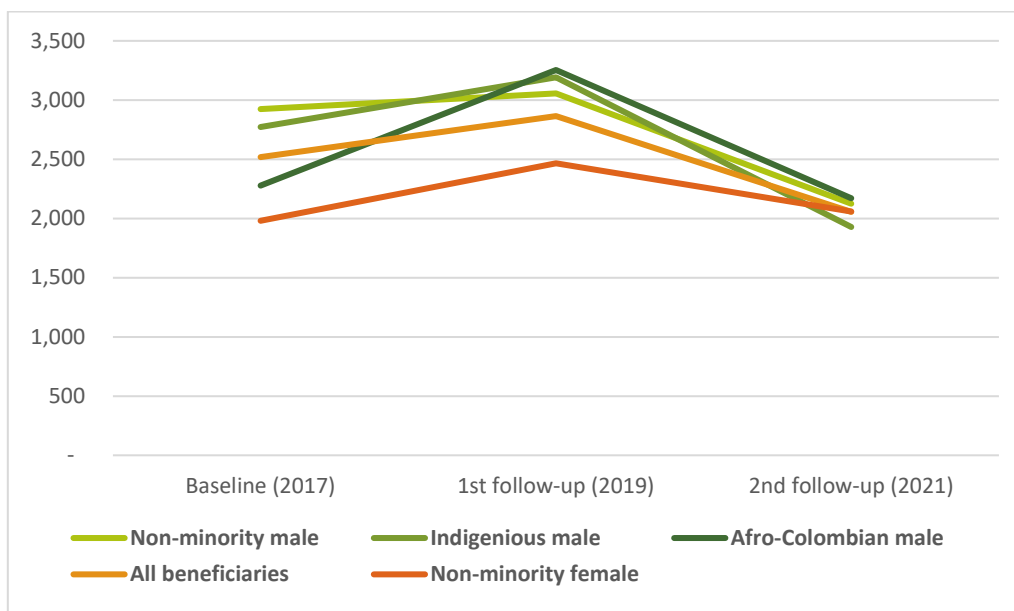
Nominal income without inflation adjustment.

¹⁸ For income change and comparison of income among projects, all income corresponds to real income (at constant prices using as base year 2018). The exchange rate from Colombian pesos to USD corresponds to the year in which the income was earned.

Figure 2: Trend in annual household income (US dollars) per subgroup (Baseline, first follow-up, and last follow-up in 2021)¹⁹, PNIS AD project, real and nominal income.



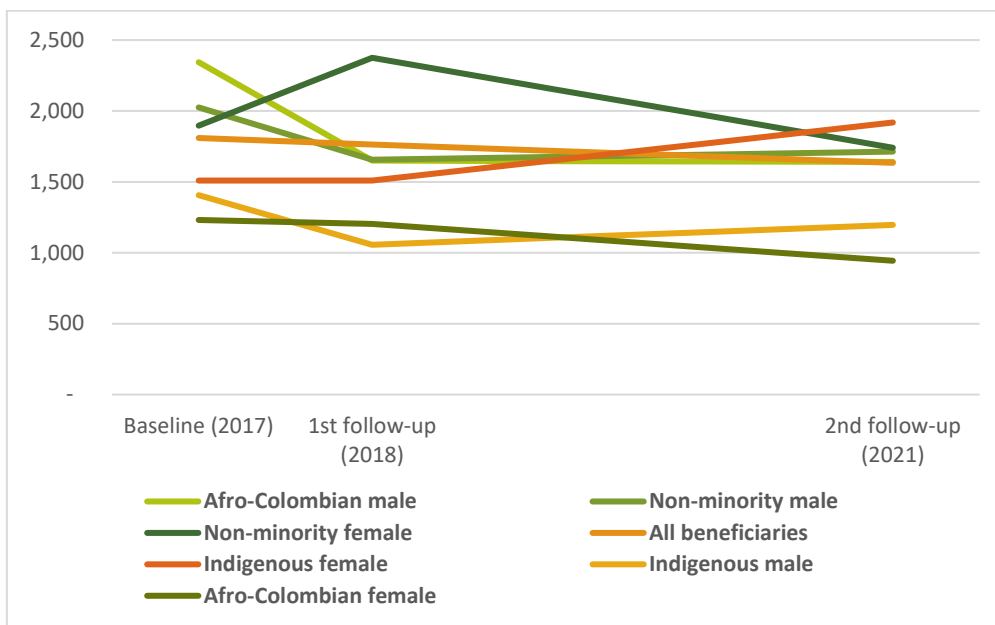
Real income (adjusted for inflation, constant prices using as base year 2018). Total number of observations = 90 (from the following subgroups: Non-minority Male=44, Indigenous Male= 8, Afro-Colombian Male=4, Non-minority Female=31). The groups Afro-Colombian Female (=2) and Indigenous Female (=1) not included in the graph/analysis due to few observations.



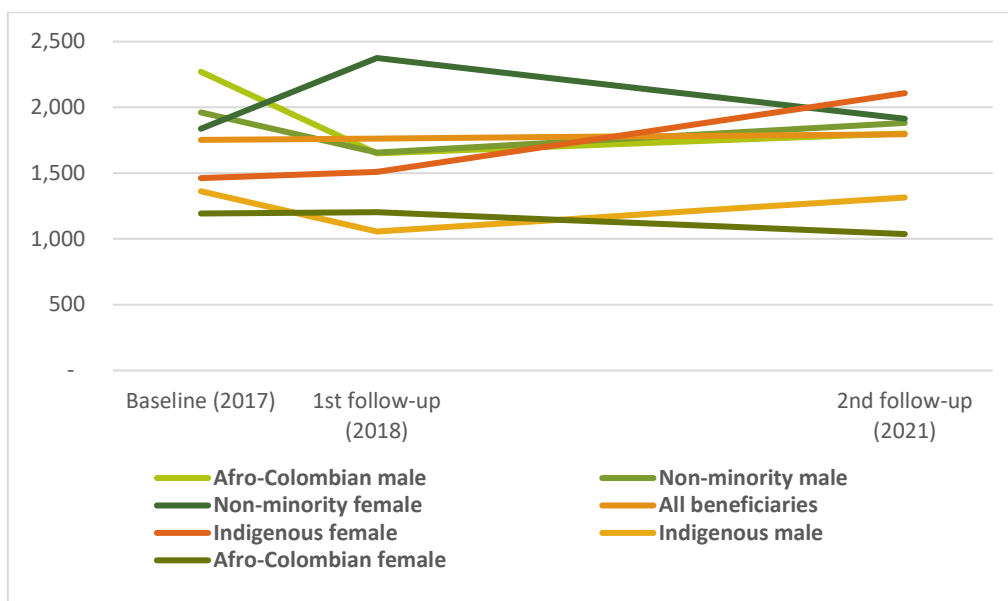
Nominal income without inflation adjustment.

¹⁹ For income change and comparison of income among projects, all income corresponds to real income (at constant prices using as base year 2018). The exchange rate from Colombian pesos to USD corresponds to the year in which the income was earned.

Figure 3: Trend in annual household income (US dollars) per subgroup (Baseline, first follow-up, and last follow-up in 2021)²⁰, Land property titles, real and nominal income.



Real income (constant prices using as base year 2018). Total number of observations = 54 (from the following subgroups: Non-minority Male = 15, Indigenous Male = 4, Afro-Colombian Male = 5, Non-minority Female = 16, Indigenous Female = 9, and Afro-Colombian Female = 5)



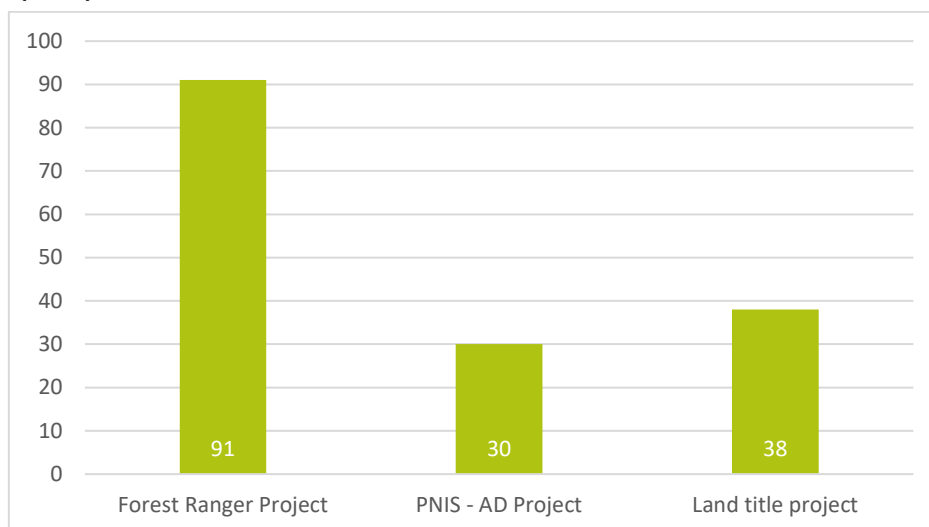
Nominal income without inflation adjustment.

Accordingly, when asked about their perception of change in income, nine out of ten of the beneficiaries of the Forest Ranger project indicated that they perceived that their income increased in

²⁰ For income change and comparison of income among projects, all income corresponds to real income (at constant prices using as base year 2018). The exchange rate from Colombian pesos to USD corresponds to the year in which the income was earned.

2021 in comparison to the baseline, while only three out of ten of the PNIS and around four out of ten of the Land Property Titles projects indicated the same.

Figure 4: Perception on income being higher than in the baseline, % of beneficiaries per project (2021)



Total number of observations: Forest ranger project= 36, PNIS= 90, and Land Title project=54. The correlation between the perception of increase in income and being a beneficiary of the Forest Ranger project is 0.469 (a moderately strong, positive correlation; the same results were obtained from Pearson, parametric, and Kendall Rank, non-parametric), while the correlation between the perception of increase in income and being beneficiary of PNIS is -0.3015 (a moderately strong, negative correlation; the same results were obtained Pearson, parametric, and Kendall Rank, non-parametric). There is no correlation between the perception of increase in income and being a beneficiary of the Land Property Titles project (the correlation is <0.01). Correlation results are statistically significant ($p < 0.05$).

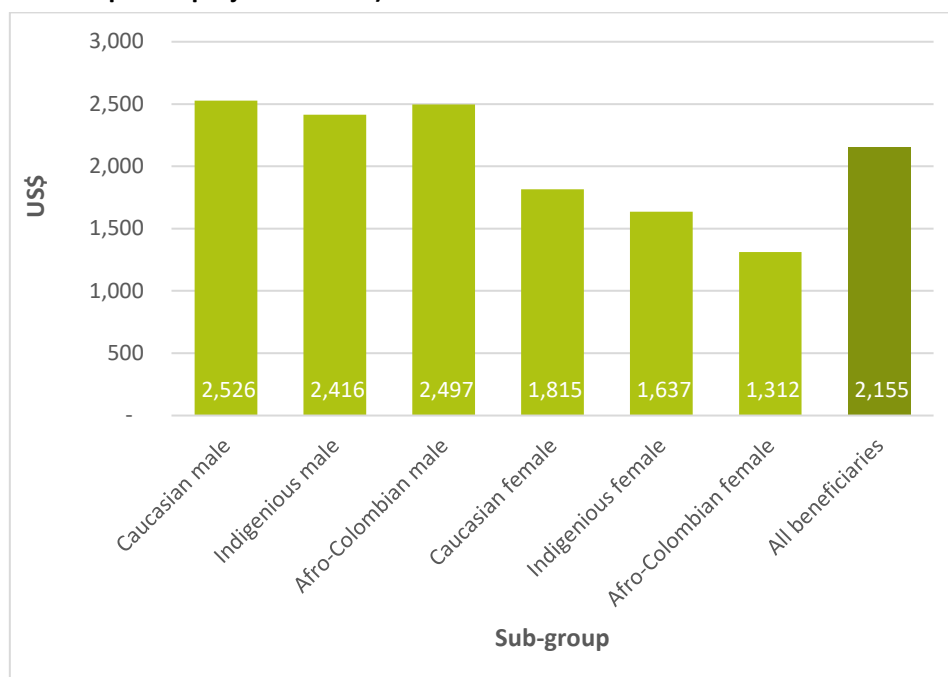
Income changes by subgroup across projects

Farmers engaged in illicit crop cultivation face persistent disadvantages. They typically live in communities with worse access to public services, infrastructure, and social protection than farmers cultivating exclusively licit cash crops. For many of these farmers, illicit-drug crop cultivation is the only source of income. Alternative development has focused on the most disadvantaged farmers, who are frequently neglected by conventional rural development interventions. Participation in alternative development projects is voluntary and inclusive, covering male, female, non-minorities, and minority groups (whether they cultivate illicit-drug crops or not)²¹.

Traditionally, rural income is strongly associated with ethnicity and gender: men earn higher incomes than women, and non-minorities earn more than minorities. The farmers interviewed for this research showed large differences in self-reported annual household income based on gender and ethnic group. During the baselines (before the projects started), non-minority males self-reported earning the highest annual household income (US\$ 2,530), closely followed by Afro-Colombian males (US\$ 2,500) and indigenous males (US\$ 2,420). Female-headed households earned significantly less than male-headed households, although to varying degrees according to their ethnic group. Among the females, non-minority females earned the highest annual household income (US\$ 1,815), followed by indigenous females (US\$ 1,640), and Afro-Colombian females (US\$ 1,310).

²¹ This is to avoid creating “perverse incentives” (farmers starting to cultivate crops only to access to the benefits of the alternative development projects).

Figure 5: Annual household income (US dollars) per subgroup (Baseline or before the alternative development projects started)

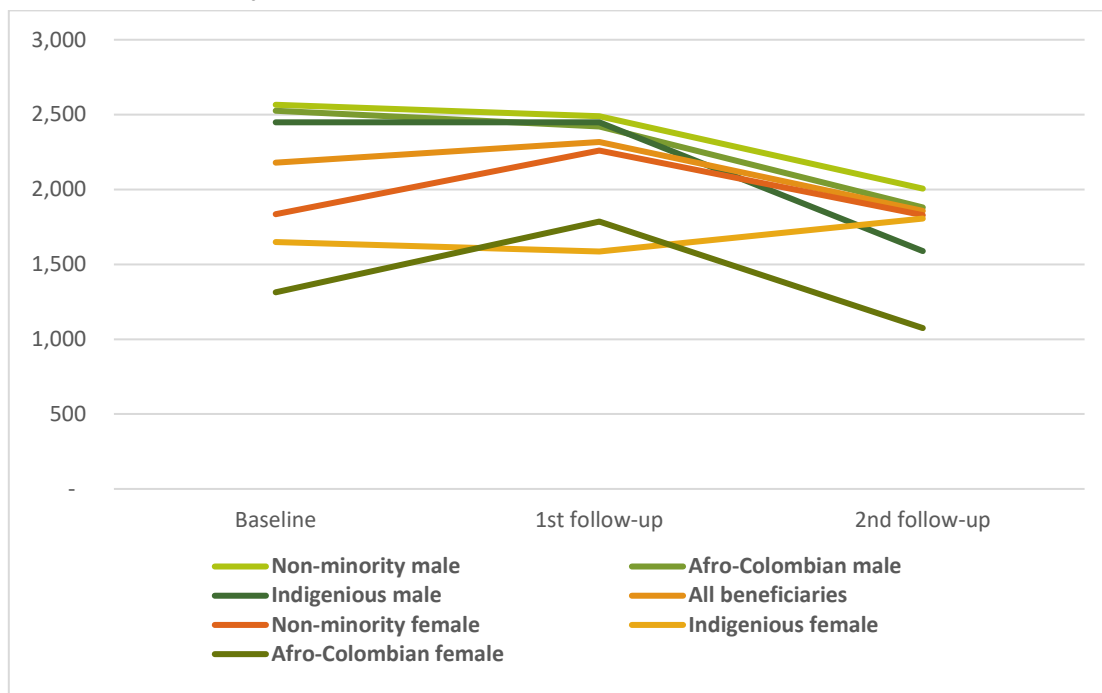


Data correspond to all beneficiaries (all projects). Real income (constant prices using as base year 2018). Total number of observations = 180 (from 216 beneficiaries, excluding 0 income responses). Included observations correspond to the following subgroups: Non-minority Male = 75, Indigenous Male = 12, Afro-Colombian Male = 9, Non-minority Female = 66, Indigenous Female = 11, and Afro-Colombian Female = 7.

For PNIS and the Land Property Rights project, the baseline corresponds to 2017. For the Forest Ranger project, the baseline corresponds to 2010. The exchange rate from Colombian pesos to US\$ corresponds to the year in which the income was earned.

All male-headed households (Non-minority, Indigenous and Afro-Colombian) experienced a slight decrease in annual income during the mid-term survey compared to the baseline, and also in the last follow-up compared to the mid-term. In contrast, all female-headed households showed an increase in annual income during at least one period of time.

Figure 6: Trends in annual household income (US dollars) per subgroup (Baseline, mid-term, and last follow-up in 2021)²²



Real income, adjusted for inflation (constant prices using as base year 2018) for comparability since the baselines and follow-ups were in different years for different projects. Data correspond to all beneficiaries (all projects). Total number of observations = 180 (from 216 beneficiaries, excluding 0 income responses). Included observations correspond to the following subgroups: Non-minority Male = 75, Indigenous Male = 12, Afro-Colombian Male = 9, Non-minority Female = 66, Indigenous Female = 11, and Afro-Colombian Female = 7.

Female beneficiaries noted an increase in income (at least prior to the COVID-19 pandemic) because of the projects. Some women were not actively participating in an income-generating activity before as they lacked the economic resources and technical knowledge to invest in their own projects. The alternative development projects offered women economic and technical assistance so they could earn additional income for their households that otherwise would have been out of reach. For instance, female beneficiaries stated:

²² For PNIS, the baseline was in 2017 and the mid-term in 2019. For the Land Property Rights project, the baseline corresponds to 2017 and the mid-term to 2018. For the Forest Ranger project, the baseline corresponds to 2010 and the mid-term to 2012. The follow up was conducted in 2021 for the three projects. For income changes and comparison of income among projects, all income corresponds to real income (at constant prices using as base year 2018). The exchange rate from Colombian pesos to USD corresponds to the year in which the income was earned.

“My household income increased with the assistance of the project. I was an (ex-) housewife and did not receive any income of my own. After the project, we improved our economic resources.” (Blanca, 77, Forest Ranger Project – Antioquia, non-minority ethnic Group, ex-coca farmer)

“Before the project, we only received some income from my ex-husband's day labour and a little from agriculture (coca). After my participation in the project, my life changed with the economic incentive, and then, with the production of cocoa. The project has helped us a lot.” (Irma, 41, Forest Ranger Project – Antioquia, ex-coca farmer)

“The project came and offered to register our property. The land was under my father's name, but he passed away. The project took good care of us. The land was divided between five siblings and my father's partner. (Without the project I would have not registered our property because I did not know how and did not have the resources to do it)” (Argenida, 40, Land Property Titles Project-Antioquia, Afro-Colombian, non-coca farmer)

Though households (both male- and female-headed households) reported increases in income between baseline and the mid-term, nearly all reported decreases in income that were largely attributed to the COVID-19 pandemic. For instance, farmers indicated that because of COVID-19:

“There is no employment, so here it is difficult. One works one day, one or two and no more. Nothing. The Land Property Titles Project has nothing to do with that. Only right now there is no work.” (Gabriel, 65, Land Property Titles Project – Antioquia, Afro-Colombian, non-coca farmer)

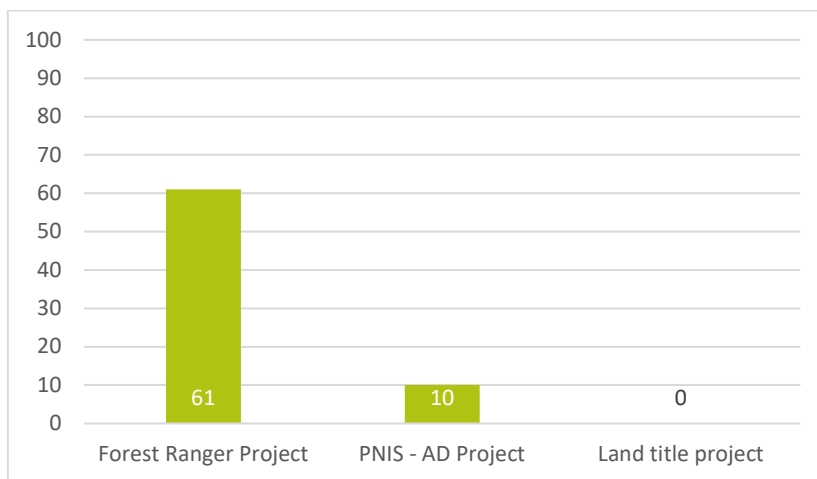
“There are not resources to work. People left the village. People no longer pass through this (river) area to transport them on the boat. All because of the pandemic.” (Nataniel, 56, PNIS-Putumayo, no ethnic minority group, ex-coca farmer)

Type of interventions and farmer's experiences

A major difference among the alternative development projects was their design and the type of interventions received by their beneficiaries. A higher income of the Forest Ranger project in comparison to PNIS and Land Title Project was related to what farmers perceived to be the main benefit of each program. For example, whether they perceived that the main benefit was (long-term) agricultural production interventions with market access or technical capacity activities (from which farmers felt they learned the skills they needed to generate income).

For instance, when asked about the main type of intervention received through the alternative development project²³, 60 percent of the beneficiaries of the Forest Ranger project indicated (long-term) agricultural production. In contrast, only 10 percent of the beneficiaries of the PNIS and none of the beneficiaries of the Land Property Titles project stated the same.

Figure 7: Agricultural production as the main type of intervention received through the project, as stated by the beneficiaries per project (2021)



Total number of observations: Forest ranger project= 36, PNIS= 90, and Land Title project=54. None of the beneficiaries of Land Property Title project indicated agricultural production as main experience with the project.

Regarding their change in income and the main type of intervention received through the project, beneficiaries of the Forest Ranger project indicated that:

“Before participating in the project, our monthly income was two hundred thousand pesos, and with the project our income increased to one million two hundred thousand pesos. We work as a family in our two hectares, and we process sugar cane every fifteen days. Life has changed a lot. We are very happy because thanks to God we do not lack resources for family sustenance” (Luz, 36, Forest Ranger Project-Antioquia, non-minority ethnic group, non-coca farmer)

“The project was uniquely good. It was a positive experience for the families. They attended the meetings in different villages and they also made sure that there were no coca crops in their villages. The project taught us to sow the grass and cattle management, also about vaccinations, purges and feeding the cattle, and how to improve the pastures with sugar cane. In the project, we also worked on the environmental part by collecting the solid waste and building landfills for the waste.” (Carlos, Forest Ranger project-Antioquia, 64, non-minority ethnic group, non-coca farmer)

²³ Options provided in the questionnaire were: cash resources, food security, agricultural production, property titles, access to markets, technical assistance and capacity building, and others. The options were mutually exclusive.

In comparison, beneficiaries of PNIS mentioned that they have received only an initial cash transfer and the food security project, and that the productive project has not been delivered yet. For example, beneficiaries of the PNIS indicated that:

“The experience was negative. The project did not meet the deadlines. The project was also positive due to the delivery of the twelve million pesos and the kitchen gardens, although they were also delayed.” (Elvira, 56, PNIS-Putumayo, indigenous, ex-coca farmer)

“After participating in the project, both the economic incentive and the food security component of the project helped us a lot. However, the project has not had continuity” (Gildardo, 49, PNIS-Antioquia, non-minority ethnic group, ex-coca farmer)

None of the beneficiaries of the Land Property Titles project associated their experience with agricultural production. In this regard, beneficiaries mentioned, for example, that:

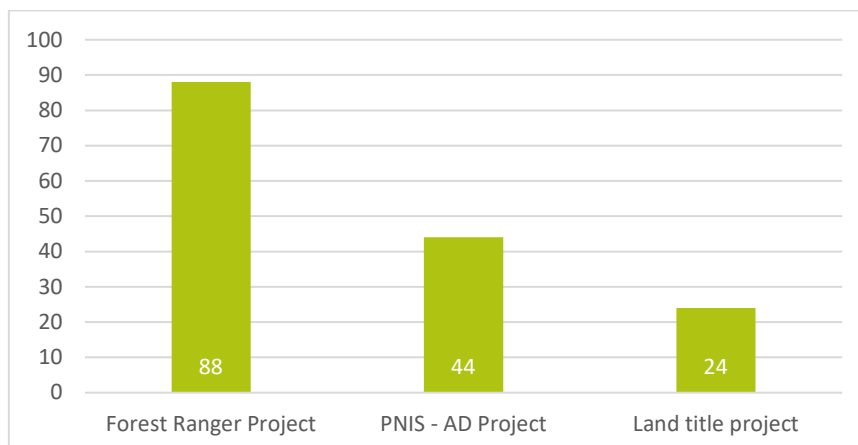
“Our income remained the same because we have the same area of land and in that area we cannot put more head of cattle, and that is why our financial situation has not improved”. (Maria, age not indicated, Land Property Titles Project – Putumayo, non-minority ethnic groups, non-coca farmer)

Regarding technical capacity, again a much larger number of beneficiaries of the Forest Ranger project indicated that they improved their technical capacity due to the project in comparison to the beneficiaries of the other two projects. Specifically, nine out of ten beneficiaries of the Forest Ranger project indicated that they perceived that their technical capacity is higher than in the baseline, while only four out of ten of PNIS and two out of ten of Land Property Title project mentioned the same.

For example, a beneficiary of the Forest Ranger project indicated that:

“I would like that the project continues by providing technical capacity trainings (which were very good). I am very grateful with the project” (Antonio, 76, Forest Ranger project- Antioquia, non-minority ethnic group, non-coca farmer)

Figure 8: Perception of the technical capacity being higher than in baseline per project (2021), % of beneficiaries



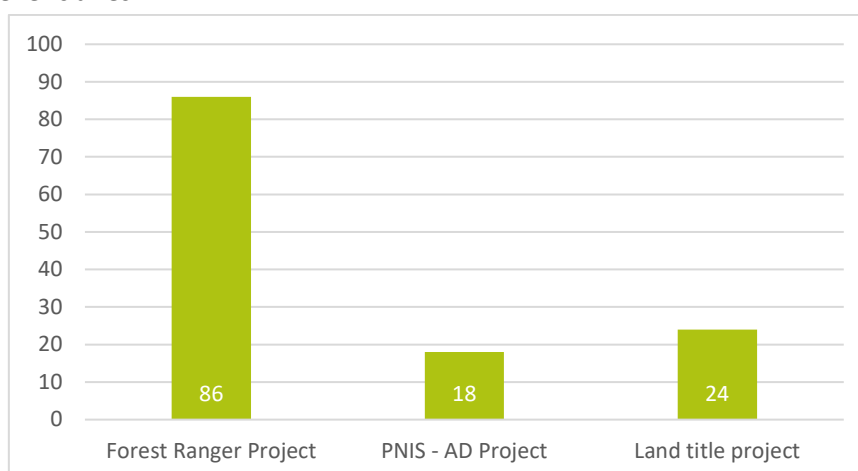
Total number of observations: Forest ranger project= 36, PNIS= 90, and Land Title project=54.

Regarding market access, once again a larger number of beneficiaries of the Forest Ranger project indicated that the market access is better for them due to the project in comparison to the beneficiaries of the other two projects. Nine out of ten beneficiaries of the Forest Ranger project stated that their market access is higher than at baseline, while only two out of ten beneficiaries of PNIS and Land Property title project indicated the same.

For example, beneficiaries of the Forest Ranger project mentioned that:

“The project taught us how to sustain the vegetable gardens for food security, and we participated in farmers’ markets for the commercialization of the surplus of our harvest. It was definitely a very good project.” (Luz, 36, Forest Ranger project-Antioquia, non-minority ethnic group, non-coca farmer)

Figure 9: Perception of the market access being higher than in baseline per project (2021), % of beneficiaries



Total number of observations: Forest ranger project= 36, PNIS= 90, and Land Title project=54.

Overall, the beneficiaries of the Forest Ranger project perceived that the project managed to provide a comprehensive and tailored set of interventions (agricultural production, technical capacity, and

market access), which are associated with higher annual household income²⁴. For instance, beneficiaries of the Forest Ranger project stated:

“The project came at a very suitable moment because we were in great need. I was working as a day labourer, because I had no help at all. The sugar cane project and the technical assistance was excellent because the project taught us how to take care of nature and prepare organic fertilizers. For the vegetable gardens for food security, the technicians were very kind, very helpful, very transparent. They taught us a lot. We were very happy. The project helped me with the bank and I got a loan of four million pesos and years ago I paid off the loan. The doors are open for me at the bank. Life has changed a lot for us and we are very happy.” (Abilio, 64, Forest Ranger Project- Antioquia, non-minority ethnic group, non-coca farmer)

“I am from the countryside and it is hard work. When the project came it was marvellous. It improved my family nutrition with the vegetable gardens. Our income improved. The project was very comprehensive. I am very grateful. I continue with my productive (coffee) project and I carry out the whole process of harvesting, post-harvesting, and transformation of the product. I roast it (coffee), grind it in an artisanal way, and commercialize it. I am considering creating my own brand” (Rosa, 52, Forest Ranger Project-Antioquia, non-minority ethnic group, non-coca farmer)

In contrast, some of the beneficiaries of PNIS mentioned problems with the implementation of the food security project in addition to the pending productive project:

“First of all, the kitchen garden was badly implemented. Then, the pigs came out in bad conditions. Old animals. I have evidence. Then, the cocoa project did not work either, because the project delivered it during the summer. Everything died, only five trees survived. The project promised to bring other supplies for the cocoa crops, but so far, they have not arrived. Supposedly, it was a ton of supplies and they did not arrive, and the third big project (of cattle) has never arrived” (Luis, 29, PNIS-Antioquia, non-minority group, ex-coca farmer).

.....
²⁴ The correlation between an increase in income and: (a) perception of agricultural production being higher than in baseline is 0.3222 (a moderately strong, positive correlation; the same result was obtained from Pearson, parametric, and Kendall Rank, non-parametric), (b) perception of technical capacity being higher than in baseline is 0.3339 (a moderately strong, positive correlation; the same result was obtained from Pearson, parametric, and Kendall Rank, non-parametric), and (c) perception of market access being higher than in the baseline is 0.4784 (a moderately strong, positive correlation; the same result was obtained from Pearson, parametric, and Kendall Rank, non-parametric).

“There was a bad management in the planning and delivery of the technical assistance of the project. In my case, the project did not provide all the necessary elements for the implementation of the vegetable garden.” (Noel, 58, PNIS-Putumayo, Afro-Colombian, ex-coca farmer).

Regarding the Land Property Titles project, some beneficiaries stated that the legal ownership of their land helped them to get access to credit and to generate the needed trust to conduct long-run investments, but most of them did not associate their experience with the project with changes in income over time:

“My income has not changed, but I know that I have the option to access to credit and rent my land” (Jose, 71, Land Property Title project-Antioquia, non-minority ethnic group, non-coca farmer)

“The land property title has helped me to access to credit and other things. I implemented a productive project of my own, pisciculture, in my land. I have also built my house with the help of the Agrarian bank.” (Jose, 54, Land Property Title project-Antioquia, Indigenous, non-coca farmer)

Initial cash transfers

Farmers indicated that the cash transfer allowed them to pay debts and gave them the freedom to invest in their own projects²⁵. For instance, farmers indicated that:

“With the cash resources, I paid my debts and bought a cargo boat that I use for work” (Rodrigo, 38, PNIS-Putumayo, non-minority ethnic group, ex-coca farmer)

“The project gave us 2 million pesos. It was good because I was able to invest the cash resources. We bought cattle with the cash resources which has helped my family a lot.” (Evelyn, 29, PNIS-Putumayo, non-minority ethnic group, ex-coca farmer)

Other aspects that were associated with a higher income earned by farmers due to program participation, although to a lesser extent, were: the age of a farmer (older farmers were associated with higher income, possibly due to better decision making and investments); strong, positive community (for example decreased coca cultivation and active community decision making); and being an ethnic minority.

²⁵ Importantly, the association between higher income and cash transfers was not obvious using only descriptive statistics and correlations. However, the qualitative responses of the farmers indeed indicated the importance of the cash transfers. The AdaBoost model assisted to uncover cash transfers as important element for improving incomes.

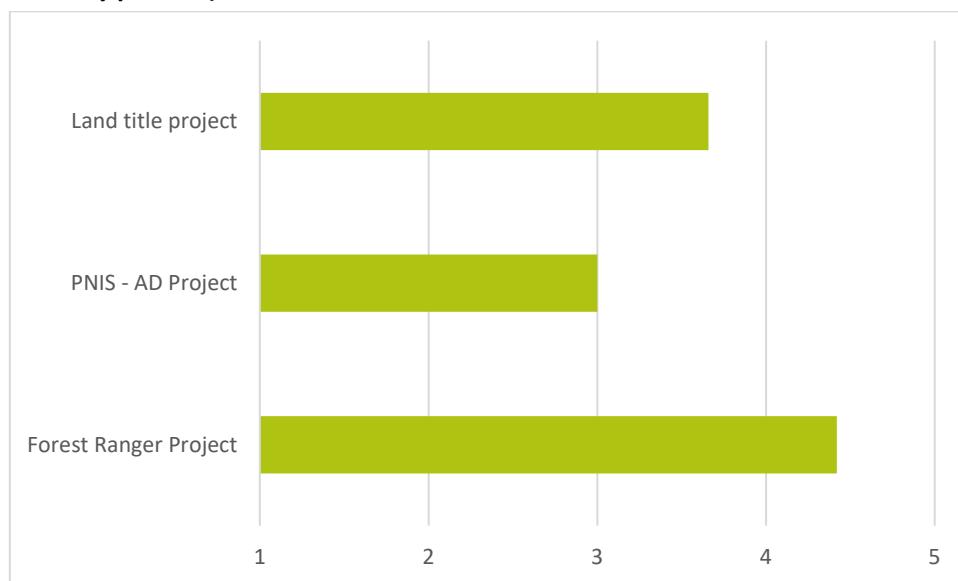
Regarding the ethnicity of the beneficiary, in similar way to female-headed households (who experienced a greater increase in their income in comparison to male-headed households as discussed above), the alternative development projects reached out to Afro-Colombian and Indigenous communities, which are not typically covered by other types of projects. In addition, minorities had initial lower income in the baseline than non-minorities, and so the benefits provided by the project tended to proportionally improve their income more than in the case of non-minorities. For example, some farmers indicated that:

“The project helped us because before we did not have enough to eat.” (Gloria, 56, PNIS-Putumayo, Afro-Colombian, ex-coca farmer)

Overall experience with the projects

The rating of the overall experience with the project and positive feelings with the project were also associated with the type of project. Beneficiaries of the Forest Ranger project rated their experience with the project higher than the beneficiaries of the other two alternative development projects. On average, the beneficiaries of the Forest Ranger project rated their overall experience with the project between positive and very positive (4.4 in the scale of 1=very negative to 5=very positive), while the beneficiaries of Land Property titles project rated their experience between neutral to positive (3.7), and the beneficiaries of PNIS rated their experience as neutral (3.0).

Figure 10: Evaluation of the overall experience by beneficiaries per project (1=very negative to 5=very positive), 2021

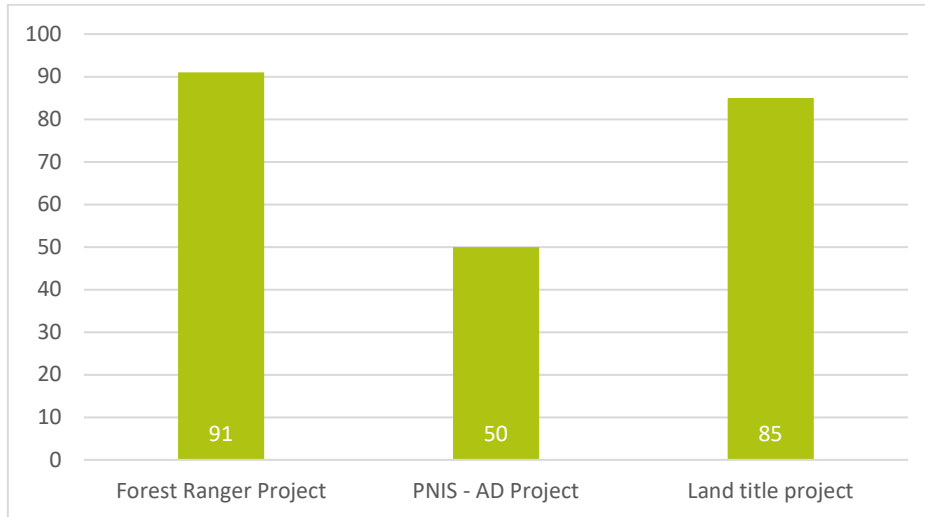


Total number of observations: Forest ranger project= 36, PNIS= 90, and Land Title project=54.

In addition, around nine out of ten beneficiaries of the Forest Ranger project and the Land Property Titles project associated their overall experience with the project with a positive feeling (including trust),²⁶ while five out of ten of the PNIS did the same.

Figure 11: Overall experience with the project associated with positive feeling (including trust) per project, 2021, % of beneficiaries

²⁶ Main positive feelings indicated by the beneficiaries included happiness, hope, trust, and strength. Negative feelings were the opposite (sadness, hopeless, untrust, and weakness).



Total number of observations: Forest ranger project= 36, PNIS= 90, and Land Title project=54.

In particular, the beneficiaries of the Land Property Title project (in comparison to the beneficiaries of the other two projects) indicated that the positive feeling, including trust in the authorities, was due to the assurance of having proof of land ownership, and not in perceived income changes:

“My satisfaction with the project is high because the land is now mine and I have the legal document that certifies me as the owner. This project gave me, my mother and my children peace of mind” (Claudia, 41, Land Property Title project, non-minority group, no coca farmer)

Voluntary eradication

Most of the beneficiaries perceived that coca cultivation decreased or remained the same over time²⁷. On average, for all the projects, nine out of ten beneficiaries perceived that coca cultivation decreased or remained the same in 2021 as in the baseline. The initial voluntary eradication of coca by the beneficiaries is most associated with the perception of changes in coca cultivation, while the income changes are not associated with this perception. However, beneficiaries of PNIS voiced concerns that some people do not want to continue in the project and plan to restart cultivating coca in the (near) future, as they have lost trust that the project will deliver its productive component.

Beneficiaries of the Forest Ranger project indicated that:

“Coca cultivation decreased here in our community, because all of us committed ourselves to the project and eradicated all the coca and replaced it with cocoa and bananas” (Ruth, 50, Forest Ranger Project - Putumayo, non-minority ethnic group, ex-coca farmer)

²⁷ Respondents were asked about their perception of changes in coca in their communities, as none of the beneficiaries indicated having coca plots after the baseline, which may be associated with fear of losing previous or current benefits from the projects.

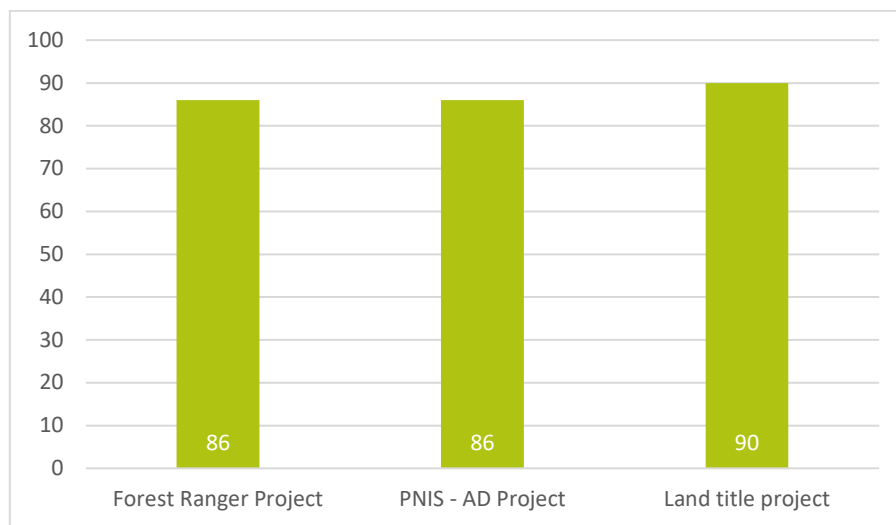
“People eradicated illicit crops to participate in the Forest Ranger project and today there are no illicit crops in the village” (Ana, 68, Forest Ranger Project – Putumayo, non-minority ethnic group, ex-coca farmer)

In contrast, beneficiaries of PNIS mentioned that:

“People no longer want to continue in the project. At first, it was perceived as positive, but today it is difficult to continue due to the non-compliance from the project side. People in our community do not want to continue with the project. (Ruben, 46, PNIS-Putumayo, Afro-Colombian, ex-coca farmer)”

“Coca increased here because people do not trust the project anymore. They do not believe what they are told. We do not longer what to be deceived” (Cielo, 48, PNIS-Antioquia, non-minority ethnic group, ex-coca farmer)

Figure 12: Perception of coca cultivation being lower or equal to baseline per subgroup and project (2021), % of beneficiaries



Total number of observations: Forest ranger project= 36, PNIS= 90, and Land Title project=54.

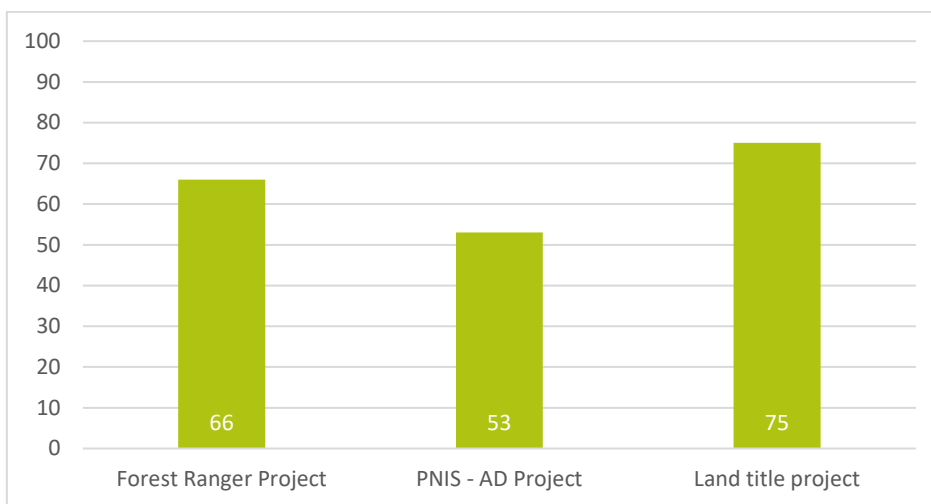
Furthermore, quantitatively there was no correlation between the perception of change in coca cultivation with the perception of change in security from the baseline in 2017 to 2021²⁸. However, the qualitative results suggest the opposite, with some beneficiaries stating the following:

“The coca crops in my village were completely eradicated. I participated in the committee that monitored the uprooting of coca bushes. Each landowner uprooted their coca plants. With the eradication of illicit crops, there was a positive change because the illegal groups no longer intervened here” (Villalba, 45, Forest Ranger project -Antioquia, non-minority ethnic group, ex-coca farmer)

“With the coca eradication, the social situation (community progress and common responsibility) improved a lot. I feel peaceful and my family and I dare to say that the whole village is feeling peaceful. It is very good to live in peace and tranquillity” (Dioselina, 75, PNIS-Antioquia, non-minority ethnic group, non- coca farmer)

“Now I have little (in comparison to when I had coca), but what I have is blessed. I am not in danger at all. Currently, I have cacao, pineapple, and manioc. I sell the surplus and I have enough to sustain myself” (Santiago, 61, PNIS-Antioquia, non-minority group, ex-coca farmer)

Figure 13: Perception of security being higher than in baseline per project (2021), % of beneficiaries



Total number of observations: Forest ranger project= 36, PNIS= 90, and Land Title project=54.

²⁸ The (Pearson parametric and non-parametric) correlation between perception of change in coca cultivation with the perception of change in security is below 0.1 (0.07). Correlation values below 0.1 are considered to show not correlation between variables.

Interest in future benefits of the projects

The beneficiaries strongly considered their future needs more than those at present. This implies that highlighting not only the short-term but also the long-term benefits may help to convince households to participate and stay as beneficiaries of the projects.

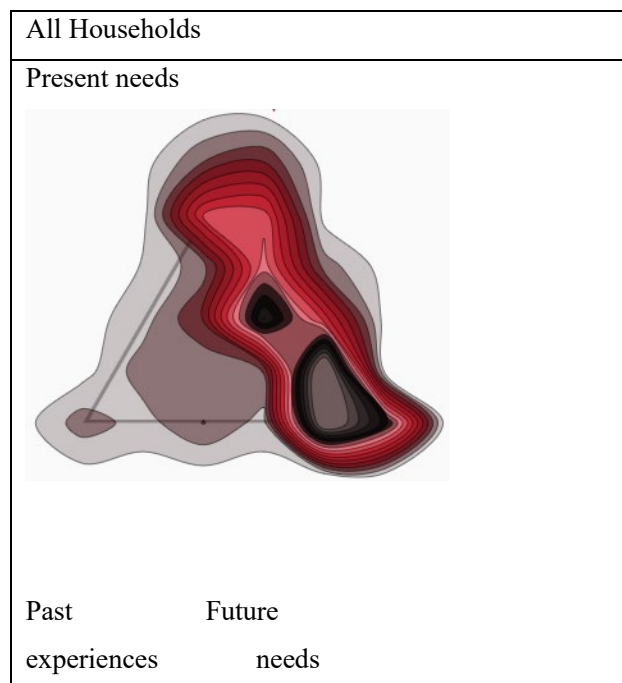
For example, regarding future needs, farmers mentioned that:

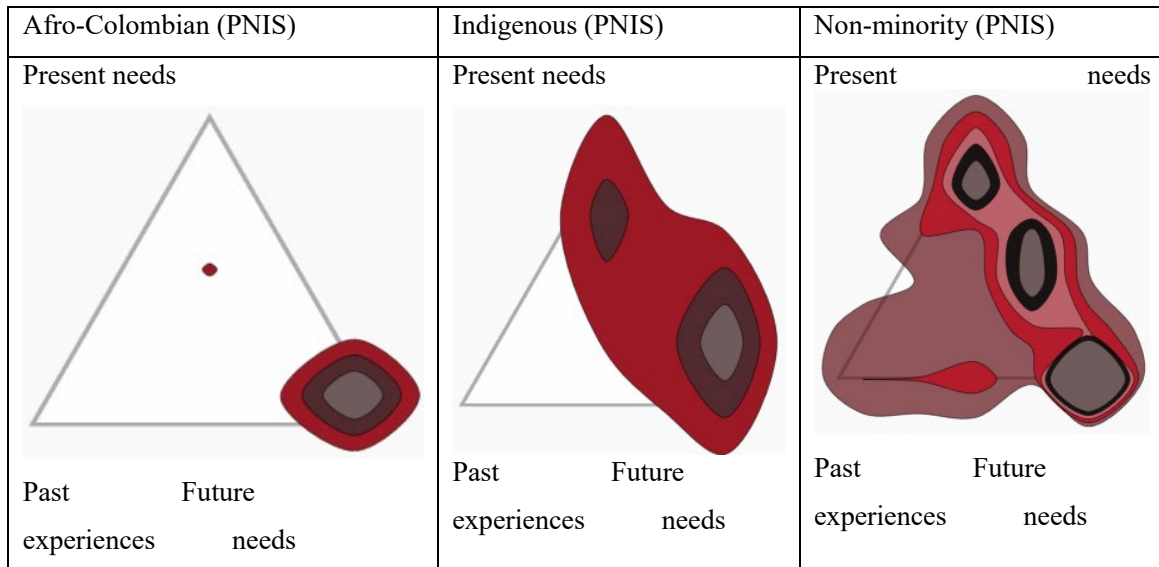
“I liked the project. It helped us. There was a vision for the future. I liked the integration among people, and the sharing with the people, and the interpersonal relationships that we made with the neighbours.” (Ignacio, 80, Forest Ranger project - Antioquia, non-minority group, non-coca farmer)

“People who participate in the project and eradicated their coca, did it thinking of a better future for their families. Only 5% did not eradicate their coca” (Dayner, 27, PNIS-Antioquia, non-minority group, ex-coca farmer)

“Currently, there is no effect of the project in my household income, but my expectations were on future (income) improvements” (Joel, 42, PNIS-Putumayo, Indigenous, ex-coca farmer)

Figure 14: Trade-off between present needs, past experiences, and future needs when taking decision about the project (2021)





Respondents were asked to place a dot inside the triangle. The closer the dot to the vertex of triangle, the more importance is placed to the characteristic in that vertex for the respondent. The colour scale corresponds to the density of the dots.

Importance of community involvement

Beneficiaries considered community influence very important when making decisions regarding the project, including participating in the project in first place. This implies the need to involve the whole community to improve and sustain project outcomes.

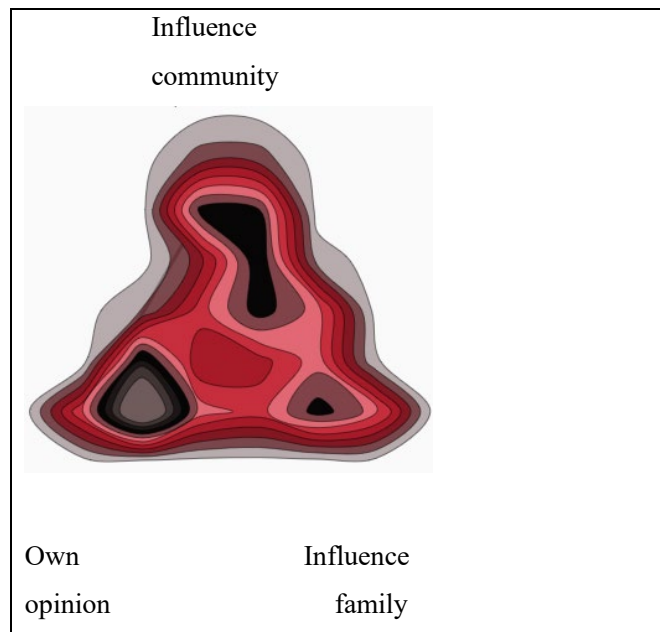
About the importance of community influence, farmers mentioned, for example, that:

“When a (new) project arrives, almost nobody is interested in participating, but then, when they see that the project complies, they want the assistance to be given to everybody.” (Ruth, 50, Forest Ranger project-Putumayo, no ethnic minority group, ex-coca farmer)

“We liked everything about the project. It also changed our relationship with our neighbours. We made good friendships and we shared work. We want it to come back.” (Irma, 41, Forest Ranger Project – Antioquia, ex-coca farmer)

“I decided to participate in the PNIS to be an example in my community of changing from illegal to legal activity. Also, I had the expectation to improve for my family. The negative part of the project was the delays. This created mistrust since there were drawbacks in the deliveries of food safety items. The program should improve the planning in delivery activities and times.” (Joel, 42, PNIS-Putumayo, indigenous, ex-coca farmer)

Figure 15: Trade-off between influence of community, influence of family, and own opinion when making decisions about the project per ethnic group (2021)



Respondents were asked to place a dot inside the triangle. The closer the dot to the vertex of triangle, the more importance is placed to the characteristic in that vertex for the respondent. The darker the colour in the heatmaps above, the larger the number of respondents that placed a dot in that area of the triangle (black and grey are the darkest, followed by red and pink tonalities).

FINDINGS FROM THE ALTERNATIVE DEVELOPMENT PROJECT IN AFGHANISTAN

Beneficiary households were poorer than non-beneficiary households

The alternative development project reached the poorest households inside the targeted rural communities, and specifically included female-headed households. The percentage of female-headed households registered as beneficiaries was 38 percent;²⁹ in contrast, the percentage of female-headed households among non-beneficiaries was 2 percent, which is in line with the overall percentage of female-headed households in Afghanistan which is approximately 1.7 percent.³⁰

The annual household income of the beneficiary households was 104,920 Afghani (US\$ 1,380)³¹, which was about 10 percent less than the annual household income of the non-beneficiary households in the same communities (118,000 Afghani or US\$ 1,550). On average, both beneficiary and non-beneficiary households had eight members and performed two types of income-generating activities.³²

On average, female-headed households earned an income of 84,090 Afghani (US\$1,100), which was notably lower than the income of male-headed households of 115,490 Afghani (US\$ 1,515).

Overall, the alternative development project benefited households with diverse income ranges, which resembled the income ranges of the other (non-beneficiary) households in the same communities. The Lorenz curves of the beneficiary households and non-beneficiary households are similar. These curves are the graphical representations of the distribution of income of these two groups. Accordingly, the values of the Gini coefficients of the beneficiary households (0.533) and non-beneficiary households (0.536) are also very similar and indicate notable inequality between the households within each group: As reference, the country with the lowest inequality has a Gini coefficient of 0.242 (Slovenia), and the country with the highest inequality has a Gini coefficient of 0.63 (South Africa). There is not data on the Gini coefficient available for Afghanistan.³³ The Gini coefficient represents the income inequality of a particular group, and it is based on the frequency distribution of its income (the Gini coefficient ranges from 0=perfect equality to 1=perfect inequality).

²⁹ For the alternative development project, female-headed households corresponded to households for which women registered as beneficiary. However, it was not possible for the project to verify if those were indeed female-headed households.

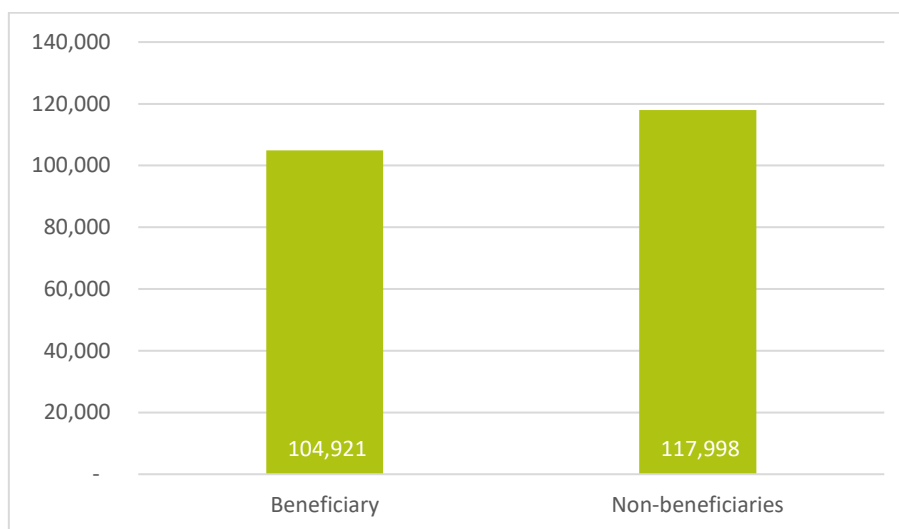
³⁰ The World Bank estimated that the percentage of female-headed households in Afghanistan in 2015 was 1.7 (World Bank. "Demographic and Health Surveys". Availability: <https://data.worldbank.org/indicator/SP.HOU.FEMA.ZS?locations=AF> Accessed on December 20, 2021)

³¹ The exchange rate for 2019 used in the chapter was 1 US\$ = 76.2 Afghani (World Bank. "World Development Indicators: Exchange rates and prices". Availability: <http://wdi.worldbank.org/table/4.16> Accessed on December 29, 2021)

³² The different economic activities performed by households were 18: salaried job, sales of legal crops, sales of poppy, sales of cannabis, rent, sales of livestock, sales of milk and cheese, sales of eggs and poultry, sales of honey and pollen, sales of handicraft, sales of forest products, sales of flowers, daily agricultural non-poppy wages, daily agricultural poppy wages, daily livestock wages, daily non-agricultural wages, petty trade, remittances, and others.

³³ (World Bank. "Development Indicators". Availability: <https://databank.worldbank.org/source/world-development-indicators> Accessed on December 20, 2021).

Figure 16: Total annual income of beneficiary households versus non-beneficiary households in the same communities (in Afghani), 2019



Number beneficiary households 5,240; non-beneficiary households in the same communities, 1,871; Means of beneficiaries and non-beneficiaries are not equal (Mann-Whitney-U non-parametric test, $p=0.0000$)

A main difference between the beneficiaries and non-beneficiaries that partially explains the income gap was that a lower percentage of beneficiaries performed stable (and locally high-paid) jobs, such as salaried jobs (14 percent) in comparison to non-beneficiaries (25 percent). Also, when beneficiaries performed salaried jobs, they earned on average 106,600 Afghani (US\$ 1,400) per year, which was lower than the average of 131,380 Afghani (US\$ 1725) earned by non-beneficiaries.

Beneficiaries and non-beneficiaries also showed differences in earnings from other economic activities such as legal crops and livestock sales. A higher percentage of beneficiaries (40 percent) than non-beneficiaries (33 percent) earned income from legal crops, but beneficiaries earned less for this activity (59,350 Afghani or US\$ 780) than non-beneficiaries (80,525 Afghani or US\$ 1,060). Regarding livestock sales, a higher percentage of beneficiaries earned income selling livestock (17 percent) than non-beneficiaries (4 percent). However, both groups earned a similar annual income of 26,450 - 28,220 Afghani (US\$ 350 - 370) from this activity.

Earnings of women in BADILL, Afghanistan

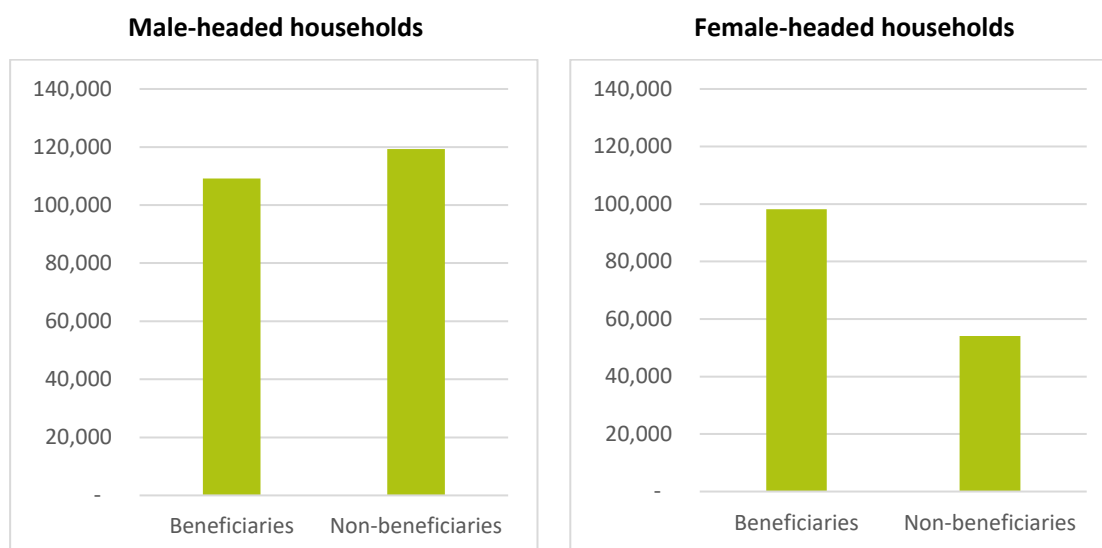
The percentage of households earning income from opium poppy sales was low among beneficiaries (6 percent) and non-beneficiaries (3 percent),³⁴ as the alternative development project was partially replacing the Good Performance Initiative (GPI), which focused on providing development assistance to those provinces that have eliminated or significantly reduced opium poppy cultivation in Afghanistan (and therefore already had a low number of households cultivating opium poppy). None of the female-headed beneficiary households or the female-headed non-beneficiary households cultivated opium poppy, as female-headed households traditionally perform activities related to rearing small animals and livestock husbandry instead of (legal or illicit) cash crop cultivation.

Earnings from dairy and poultry sales (the two main types of interventions of the alternative development project) were traditionally low. Beneficiaries earned on average 7,600 Afghani (US\$ 100) per year from dairy sales, while non-beneficiaries earned 19,860 Afghani (US\$ 260) per year. For poultry, beneficiaries earned 9435 Afghani (US\$ 124) and non-beneficiaries 6,435 Afghani (US\$ 84).

³⁴ These percentages correspond to 297 beneficiary households cultivating opium poppy and 103 non-beneficiary households. Therefore, the number of households cultivating opium poppy is large enough to conduct subsequent statistical analysis and modelling.

The percentage of beneficiaries earning income from dairy sales was 9 percent and of non-beneficiaries was 8 percent; while the percentage of beneficiaries obtaining income from poultry was 9 percent and of non-beneficiaries was 6 percent. The low income from these activities suggests opportunities for improvement and enhancing the income specifically for female-headed households through these activities.

Figure 17: Total annual income of beneficiary households versus non-beneficiary households by gender of the head of the household (in Afghani), 2019



Number beneficiary households 3,220; non-beneficiary households 1,832

Number beneficiary households: 2020, non-beneficiary households: 39

The difference in annual income between female-headed households and male-headed households among beneficiaries was small (US\$ 145), while the difference between male- and female-headed households among non-beneficiaries was very large (US\$ 860). A key reason for this difference is the emphasis of the project on the female-headed households. Before starting the project, 7 percent of the beneficiary female-headed households earned income from petty trade equal to 289,930 Afghani (US\$ 3,805) per year, while 10 percent of non-beneficiary female-headed households earned income from petty trade but received only 5,200 Afghani (US\$ 70) per year.

Accordingly, the Gini coefficient for petty trade among female-headed beneficiary households (0.653) was higher than the Gini coefficient among female-headed non-beneficiary households (0.528). This difference shows a higher inequality in earnings from this economic activity among female-headed beneficiary households (a number of top-income earners among this group) than among female-headed non-beneficiary households.

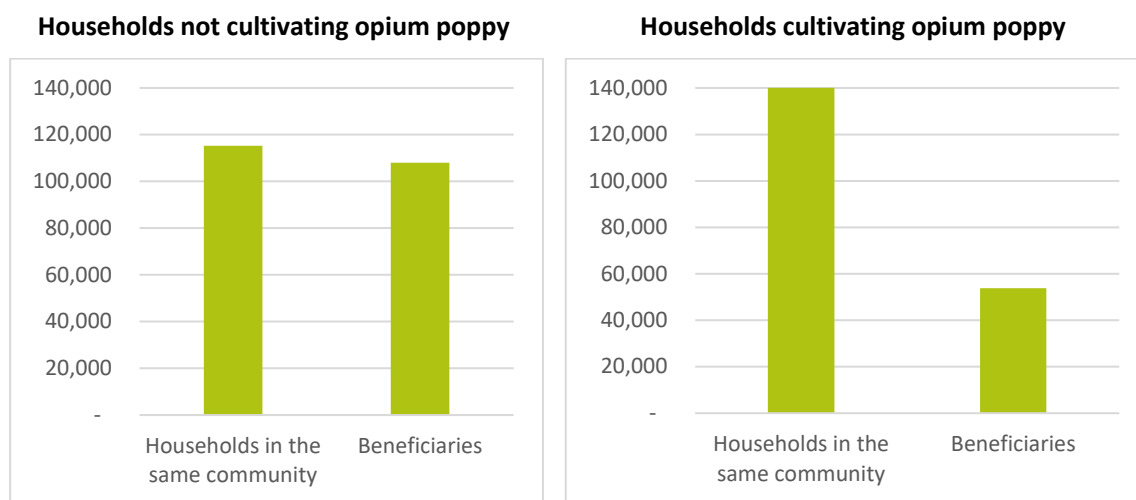
The alternative development project was successful in attracting households cultivating opium poppy who were lower income and needed assistance the most. The annual household income of beneficiary households not cultivating opium poppy was 108,000 Afghani (US\$ 1,420) and was similar to the annual household income earned by non-beneficiary households not cultivating opium poppy (115,300 Afghani or US\$ 1,510). In contrast, the annual household income of beneficiary households cultivating opium poppy of 53,810 Afghani (US\$ 705) was much lower than the annual household income of non-beneficiary households cultivating opium poppy of 164,430 Afghani (US\$ 2,160).

In addition, the Gini coefficients of beneficiary households cultivating opium poppy (0.325) and non-beneficiary households cultivating opium poppy (0.357) were similar and relatively low (indicating not a large amount of inequality). This indicates that the comparative range of income distributions among the households within these two groups were also similar, but for beneficiary households it was

concentrated in the lower income range, while for non-beneficiary households it was in the higher income range.

One main difference between beneficiary households cultivating opium poppy and non-beneficiary households cultivating opium poppy was the income from legal crops. For instance, 80 percent of beneficiary households cultivating opium poppy earned income from legal crops while 100 percent of non-beneficiary households cultivating opium poppy earned income from this economic activity. In addition, beneficiary households earned much less from this economic activity (18,670 Afghani or US\$ 245) than non-beneficiary households (82,760 Afghani or US\$ 1,085). Conversely, beneficiary households cultivating opium poppy (17 percent) earned income from livestock sales, while none of the non-beneficiary households cultivating opium poppy earned income from this activity.³⁵

Figure 18: Total annual income of beneficiary households versus non-beneficiary households by opium poppy cultivation status of the household (in Afghani), 2019



Number of beneficiary households: 4,943, non-beneficiary households: 1,768.

Number beneficiary households: 297, non-beneficiary households: 103.

Overall, beneficiary households cultivating opium poppy were predominantly among the poorest 20 percent of the beneficiary households. For instance, (male-headed) beneficiary households who were in the bottom income quintile were less likely to have a salaried job, make profits from land or vehicle rentals, engage in petty trade, or earn income from livestock than the other 80 percent of households. Conversely, they were more likely to earn income from opium poppy sales or from working as a daily opium poppy labourer (Table 1).

Regarding the wealthiest 20 percent of (male-headed) beneficiary households, they were making none or less income from opium poppy sales and/or from daily opium poppy wages and were making more income from salaried jobs and petty trade than the other 80 percent of households. However, it was the opposite for (male-headed) non-beneficiary households. The wealthiest 20 percent were making income from opium poppy sales.

These results are in line with the main type of interventions promoted by the project (dairy and poultry sales) that currently generate relatively low income (US\$100-200 per year) and are likely attracting mostly poor households for which this low additional income can help the most.

Households cultivating opium poppy were more likely to participate in the alternative development programme if they were making less income from eggs and poultry sales, as the project could

³⁵ Overall, this could be related to the scarce agricultural land for crop cultivation from the beneficiaries. Unfortunately, there is not complete information on this issue among beneficiaries for evaluating this.

particularly assist them to increase their income from these activities. In addition, the project seemed to attract households cultivating opium poppy who made less income from legal crops and from dairy and livestock wages. These households may have land availability constraints, and therefore non-crop interventions may be particularly suitable for them³⁶. Nevertheless, future alternative projects in the same or similar areas may want to consider additional specific high-value crop interventions to attract the missing households cultivating opium poppy to participate in the project.

Number of income-generating activities

The provision of only one economic alternative cannot easily compete with illicit-drug crop income generation; diversification and value addition are crucial in strengthening licit sources of income. Farmers and communities can reduce their risk of reliance on illicit-drug crops by improving income margins through different combinations of licit crops, livestock, processing, and off-farm income generating activities.³⁷

Households cultivating opium poppy were involved in higher income diversification than households not cultivating opium poppy. On average, beneficiary and non-beneficiary households cultivating opium poppy engaged in 5 types of income-generating activities, while beneficiary and non-beneficiary households not cultivating opium poppy engaged in only 2 different types.

Table 1: Number of income-generating activities by beneficiary households vs. households in the same communities per opium poppy cultivation status of the household, 2019

	Households not cultivating opium poppy	Households cultivating opium poppy	All households
Beneficiary households	1.94	4.64	2.09
Non-beneficiary households	2.03	4.51	2.16

However, households cultivating opium poppy made less income from the same economic activity than households not cultivating opium poppy. For example, households cultivating opium poppy earned 85,370 Afghani (US\$ 1,120) for salaried jobs while households not cultivating opium made 107,300 Afghani (US\$ 1,410). In this regard, the results of a regression suggest that increasing the income of practically any legal economic activity will be more likely to decrease the probability of cultivating opium poppy, rather than promoting more diversification or increasing the number of income-generating activities (as households cultivating opium poppy already diversify their sources of income).

Future alternative development projects may want to primarily focus on activities that have the highest potential to increase the overall household income (which may be complemented with income-generating options for women like those in this project, despite these options' lower earning potential).

³⁶ Availability of agricultural land is critical in Afghanistan. Although there are not current official estimates, there are on average 0.01 hectares of agricultural land per person in several rural communities in this country (UNODC. 2017. Needs Assessments of CBARD projects in Afghanistan). This is below the estimated minimum needed for feeding one person, which has been roughly calculated in 0.07 ha (Myers, 1998, cited by FAO)

³⁷ Commission on Narcotic Drugs. 2019. Conference Room Paper Submitted jointly by Germany, Peru, Thailand and UNODC, titled "The Future of Alternative Development". E/CN.7/2019/CRP.2