Let's say humanity is early on the time before the heat death of the universe, and we got our collective shit together, and we're deciding how to allocate resources.

For simplicity of calculations, let's also suppose that humanity seems to have a billion person-years left, and we're feeling pretty confident in our beliefs about how the universe works.

There's at least two ways in which it might be correct to think about investments aimed at creating additional person-years:
- an investment gives us some chance at creating some particular number of additional person-years, e.g. a 10% chance of creating a billion additional person-years
- an investment gives us particular chances at creating many different numbers of additional person-years, e.g. some chance at creating exactly one additional person-year, and some chance at creating two, and so on

(The first possibility of these seems like a special case of the second.)

If the first way of thinking about this is correct, then the value of investing to create more person-years is finite, so it might be less good than some near-term investment to improve the quality of people's lives.

If the second way of thinking about this is correct, then the value of investing to create more person-years is still finite, iff the sum of ([the terminal value of creating some exact number of person-years]*[the probability that one succeeds at doing so]), for each number of person years that might be created as a result of the investment, converges to a finite number. This could occur if the probability of success falls more quickly than the value of success.

Attempting to do the math for that last point:

(equations are followed by explanations of the transition to the next step, when I felt like I wouldn't find it obvious if I were reading this)

Expected value of investing to create more person-years, when doing so gives you some probability of creating any positive whole number of person-years (and this probability is P(n), i.e. it is a function of n, the number of person-years in question):
(Also supposing, for simplicity, that each person-year would be equally good)

= the sum of ([the value of creating some exact number of person-years]*[the probability that one succeeds at doing so]), for each number of person years that might be created

$$= \sum_{n=1}^{\infty} n \cdot P(n)$$

(It's useful to separate this sum into two parts)

$$= \sum_{n=1}^{99} n \cdot P(n) + \sum_{n=100}^{\infty} n \cdot P(n)$$

(The first term here is the sum of a finite number of finite terms, so it is finite. Let's call it C_1 so that it takes up less space.)

$$= C_1 + \sum_{n=100}^{\infty} n \cdot P(n)$$

(P(n) is currently being multiplied by (100,101,102…), which increases linearly. The sum would be bigger if P(n) were instead being multiplied by (100, 101, 102.01…), a sequence that starts the same but increases geometrically, with a constant rate of 1%. So this sum is less than the sum if we make that replacement.)

$$< C_1 + \sum_{n=100}^{\infty} \left[100 \cdot (1+0.01)^{n-100}\right] \cdot P(n)$$

(The point of this is to show that this series converges under plausible conditions, not that it converges under any conditions, so it's fine if I further suppose that some plausible conditions exist. So I make the additional supposition that $P(n)=(1-0.011)^{n-100}$. In other words, for any exact number of person-years over 100 that we might get as a result of our investment, the probability that we do so decays by a little more than 1% every time the number of person-years in question increases by 1.)

$$= C_1 + \sum_{n=100}^{\infty} 100 \cdot (1+0.01)^{n-100} \cdot (1-0.011)^{n-100}$$

$$= C_1 + 100 \sum_{n=100}^{\infty} \left[(1+0.01) \cdot (1-0.011)\right]^{n-100}$$

$$= C_1 + 100 \sum_{n=100}^{\infty} (1-0.00111)^{n-100}$$

(This sum is a convergent geometric series (a finite number). Let's call the sum C_2.)

$$= C_1 + 100 \cdot C_2$$

(So we're left with a finite number added to 100 of another finite number. This makes a new finite number.)

$$= C_3$$

So the expected value of investing to create more person-years is less than some finite value. Therefore, if the value of investing for the near-term is sufficiently large, doing so would have higher expected value.

(Alternatively: if altruistic decision-makers expect future decision-makers to always pass forward the buck on improving well-being and therefore never do any good, they might want to constrain future decision-makers so that the latter bring about some near-term good. Even from an ethical view with 0 time discounting, this would be better than the alternative of nothing good ever happening. So, even if the buck could always be passed forward, 0-discounters would still bring about some good because it would be better, by their values, to constrain future decision-makers in this way rather than to act in such a way that no good ever gets done.)