[0004]

In the image coding method and the image decoding method which adopt such video coding schemes, there is a demand for a further improvement in coding efficiency.

[0005]

Thus, embodiments of the present invention provides an image coding method or an image decoding method in which the coding efficiency can improve.

[Solution to Problem]

[0006]

According to a first aspect of the present invention, there is provided anAn image coding method ~~according to an aspect of the present invention is an image coding method~~ for generating a coded bitstream by coding an image using (i) a buffer description for specifying a picture to be held in a buffer and (ii) a reference list description for specifying a picture to be referred to, the image coding method comprising: writing, into a sequence parameter set, buffer description defining information for defining a plurality of buffer descriptions; writing, into the sequence parameter set, reference list description defining information for defining a plurality of reference list descriptions corresponding to the buffer descriptions; selecting, for each processing unit that is a picture or a slice, one of the buffer descriptions, and writing, into a first header of the processing unit, buffer description selecting information for specifying the selected buffer description, the first header being included in the coded bitstream; and coding the processing unit using the selected buffer description and one of the reference list descriptions which corresponds to the selected buffer description.

According to a second aspect, there is provided an image decoding method for decoding a coded bitstream using (i) a buffer description for specifying a picture to be held in a buffer and (ii) a reference list description for specifying a picture to be referred to, the image decoding method comprising: obtaining, from a sequence parameter set corresponding to the coded bitstream,

buffer description defining information for defining a plurality of buffer descriptions; obtaining, from the sequence parameter set, reference list description defining information for defining a plurality of reference list descriptions corresponding to the buffer descriptions; obtaining, from a first header of a processing unit that is a picture or a slice, buffer description selecting information for specifying one of the buffer descriptions, the first header being included in the coded bitstream; and decoding the processing unit using (i) a buffer description specified in the buffer description selecting information and (ii) one of the reference list descriptions which corresponds to the specified buffer description.

According to a third aspect, there is provided an image coding apparatus for generating a coded bitstream by coding an image using (i) a buffer description for specifying a picture to be held in a buffer and (ii) a reference list description for specifying a picture to be referred to, the image coding apparatus comprising a frame memory control unit configured to perform the following: writing, into a sequence parameter set, buffer description defining information for defining a plurality of buffer descriptions; writing, into the sequence parameter set, reference list description defining information for defining a plurality of reference list descriptions corresponding to the buffer descriptions; and selecting, for each processing unit that is a picture or a slice, one of the buffer descriptions, and writing, into a first header of the processing unit, buffer description selecting information for specifying the selected buffer description, the first header being included in the coded bitstream, wherein the image coding apparatus codes the processing unit using the selected buffer description and one of the reference list descriptions which corresponds to the selected buffer description.

According to a fourth aspect, there is provided an image decoding apparatus for decoding a coded bitstream using (i) a buffer description for specifying a picture to be held in a buffer and (ii) a reference list description for specifying a picture to be referred to, the image decoding apparatus comprising a frame memory control unit configured to perform the following: obtaining, from a sequence parameter set corresponding to the coded bitstream, buffer description defining information for defining a plurality of buffer descriptions; obtaining, from the sequence parameter set, reference list description defining information for defining a plurality of reference list descriptions corresponding to the buffer descriptions; and obtaining, from a first header of a processing unit that is a picture or a slice, buffer description selecting information for specifying one of the buffer descriptions, the first header being included in the coded bitstream, wherein the image decoding apparatus decodes the processing unit using (i) a buffer description specified in the buffer description selecting information and (ii) one of the reference list descriptions which corresponds to the specified buffer description.

According to a fifth aspect, there is provided an image coding and decoding apparatus comprising the image coding apparatus according to the third aspect and an image decoding apparatus according to the fourth aspect.

[0007]

These general and specific aspects may be implemented using a system, a method, an integrated circuit, a computer program, or a computer-readable recording medium such as a CD-ROM, or any combination of systems, methods, integrated circuits, computer programs, or computer-readable recording media.

[Advantageous Effects of Invention]

[0008]

Embodiments of the~~The~~ present invention provide~~s~~ an image coding method or an image decoding method in which the coding efficiency can improve.

[Brief Description of Drawings]

[0009]

[FIG. 1] FIG. 1 shows an example of a picture referencing structure.

[FIG. 2] FIG. 2 shows a structure of a coded bitstream.

[FIG. 3] FIG. 3 is a block diagram of an image coding apparatus according to the first embodiment of the present invention.

[FIG. 4] FIG. 4 is a flowchart of an image coding method according to the first embodiment of the present invention.

[FIG. 5] FIG. 5 is a flowchart of a writing process of reference list description defining information according to the first embodiment of the present invention.

[FIG. 6] FIG. 6 is a flowchart of the first example of a coding process according to the first embodiment of the present invention.

[FIG. 7] FIG. 7 is a flowchart of the second example of the coding process according to the first embodiment of the present invention.

[FIG. 8A] FIG. 8A shows a structure of a coded bitstream according to the first embodiment of the present invention.

[FIG. 8B] FIG. 8B shows a structure of a coded bitstream according to a variation of the first embodiment of the present invention.

[FIG. 9] FIG. 9 shows a syntax structure of a sequence parameter set according to the first embodiment of the present invention.

[FIG. 10] FIG. 10 is a block diagram of an image decoding apparatus according to the first embodiment of the present invention.

[FIG. 11] FIG. 11 is a flowchart of an image decoding method according to the first embodiment of the present invention.

[FIG. 12] FIG. 12 is a flowchart of a process of obtaining the reference list description defining information according to the first embodiment of the present invention.

[FIG. 13] FIG. 13 is a flowchart of the first example of a decoding process according to the first embodiment of the present invention.

[FIG. 14] FIG. 14 is a flowchart of the second example of the decoding process according to the first embodiment of the present invention.